Overview of FIPS 201 Revision 3

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August, 2019
Federal Computer Security Managers' Forum

National Institute of Standards and Technology
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Overview

- Status Quo- The current Standard (R2)
- Where we'll headed: Priority Change Requests
- PIV Authenticators and Federation
- In Closing

HSPD-12

"**There are wide variations in the quality and security of identification used to gain access to secure facilities** where there is potential for terrorist attacks. In order to eliminate these variations, U.S. policy **is to enhance security, increase Government efficiency, reduce identity fraud, and protect personal privacy** by establishing a mandatory, Government-wide standard for secure and reliable forms of identification issued by the Federal Government to its employees and contractors (including contractor employees). "

Homeland Security Presidential Directive-12

August 27, 2004

Where We Are:

Status Quo: Revision 2 of FIPS 201

- Addition of Derived PIV Credentials – as an optional authenticator for platforms that do not support smartcards (currently restricted in SP 800-157 to mobile devices)
- Virtual Contact Interface – secure communication for wireless authentication
- Biometrics:
  - addition of iris as an option for enrollment/binding to enrollment record
  - Made facial image template mandatory as an on-card biometric – can be used at enrollment/re-issuance
  - Option for match on card fingerprint authentication

- Green text indicate that the R2 revision items play a role in R3

continued Where We Are:

Status Quo: FIPS 201 Revision 2

- Deprecated the CHUID authentication mechanism and indicated its removal from a future FIPS
- Made *PKI-CAK* cryptographic key mandatory for PIV Cards, intended use for 1 factor wireless authentication and as one of the replacement of the CHUID authentication mechanic

- Signature and encryption Key became mandatory

- Green items indicate that the R2 revision item plays a role in R3.

Change Requests

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Where We Are Headed:

Change Requests for FIPS 201 Revision 3

- Addition of other Form Factors not just smartcards because…
  - Some platforms do not support smartcards
- Additional non-PKI Derived PIV Credentials (Authenticators) because…
  - We use alternatives, especially where smartcards are not supported
- Federation
  - shifting interagency interoperability requirements of HSPD-12 to federation

(continued) Change Requests for R3

- Identity Proofing in General
  - The FIPS 201/SP 800-63 alignment
    - Identity Source Documents
  - Remote supervised identity proofing
    - Supervised remotely – is local attendant needed?

(continued) Change Requests for R3

PIV and PACS

- Removal of the CHUID authentication mechanism
- Alternatives for CHUID authentication mechanism
  - desired properties: fast, wireless (touch-and-go), one-factor
  - PKI-CAK, FICAM e-PACS server-based BIO-in-PACS (mixed review), Opacity
- Deprecating VIS (flash pass - guard comparing card photo)
- Addition of Mobile Device (maybe others) for PACS?

Miscellaneous Change Requests…

- Make NACI background investigation indicator on PIV Authentication Certificate optional & deprecate in future
- Considering additional PIV Card Security Features (SF)
  - Currently requires only one SF – strongly recommend three
  - Deprecate PIV card magnetic stripe and bar code

FIPS 201-3 Update:

Derived PIV Credential

Authenticators and Federation

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Derived PIV Credential (DPC)

Authenticators

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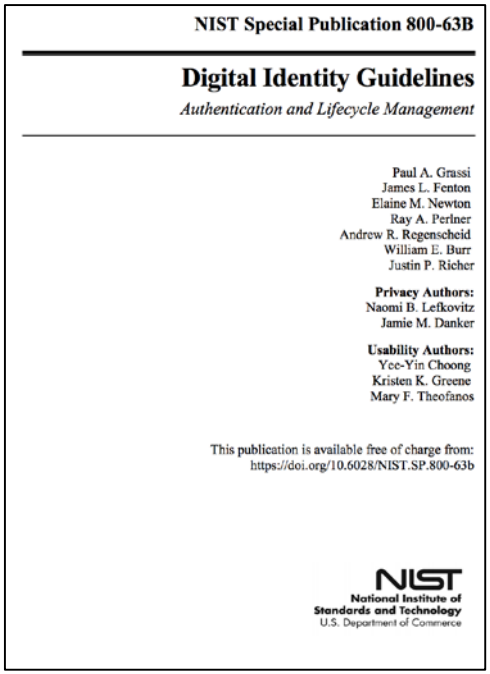
Anticipated Changes in FIPS 201-3

- Broadly allow alternative authenticators to be derived from PIV credentials
  - Specify requirements in new Special Publication
  - **AAL2** and **AAL3**
  - Rely on SP 800-63B as the basis for security requirements
  - Facilitate interoperability through federation, not authenticator standards


NIST Special Publication 800-63B

Digital Identity Guidelines

Authentication and Lifecycle Management

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This publication is available free of charge from:
https://doi.org/10.6028/NIST.SP.800-63b

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Authenticator Assurance Levels

	AAL2	AAL3
Types	Combinations providing multifactor authentication: OTP, Out-of-Band, Look-up Secrets, software crypto	Hardware cryptographic authenticators (multifactor authenticators or combinations)
Examples	Passwords with: • Push notifications, • OTP/SecureID • FIDO U2F Software-based Derived PIV	PIV cards* Hardware-based Derived PIV* FIDO with Token Binding + password
MitM Resist.	**Required**	**Required**
Verifier Impersonation Resist.	Not Required	**Required**
Verifier Compromise Resist.	Not Required	**Required**
Auth. Intent	Recommended	**Required**

Authenticator Interoperability

- **Objectives**
  - Support interagency reuse and acceptance
  - Facilitate technical interoperability with applications
- Many non-PKI authenticators are for use with a single CSP/Verifier
  - Limits need for authenticator-based interoperability
- **Shift interoperability focus to federation**
  - **Provides abstraction layer to support multiple authenticators**
  - **Can simplify authenticator management**
- WebAuthn/FIDO
  - FIDO/WebAuthn guidance could promote security, facilitate compatibility between gov't servers and industry authenticators

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Authenticator Challenges: The Link to PIV Cards

- PIV Card and DPC authenticator are tightly linked.
  - Authenticators need to be terminated if eligibility to hold a PIV Card ends/is terminated
  - Requires links to PIV Card issuer
    - Easier to maintain if issuer of DPC authenticator and PIV Card is the home agency (the same issuer) – IDMS maintains it.
    - Hard to maintain/communicate if DPC authenticator and PIV Card issuer are different
  - NIST to restrict issuance of Derived PIV Credential (authenticators) to home agency to facilitates termination of authenticators

Federation

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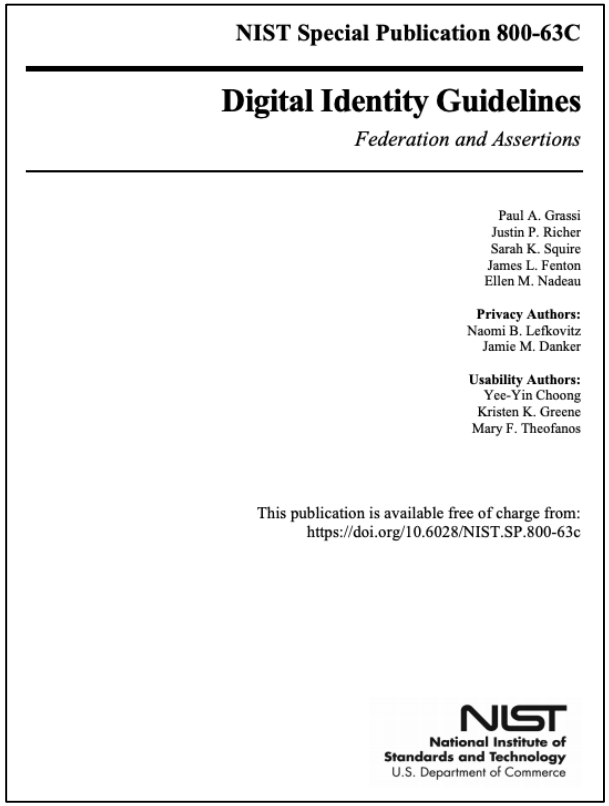
Anticipated Changes in FIPS 201-3

- Encourage federation to facilitate interoperability and flexibility
  - Specify requirements in new Special Publication
  - Rely on SP 800-63C as the basis for security requirements at FAL1-3.
  - Identify/develop profiles of common federation protocols
  - Develop guidelines for IdPs/CSPs



NIST Special Publication 800-63C

Digital Identity Guidelines

Federation and Assertions

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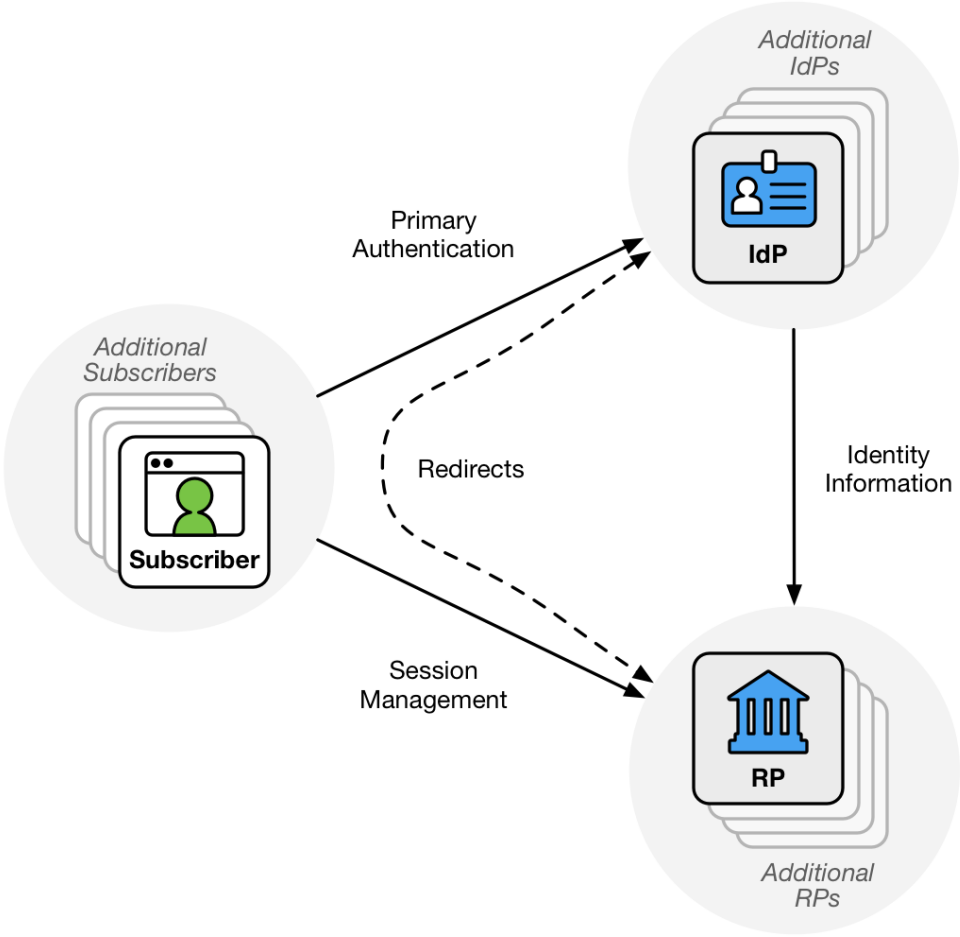
What is federation?

A process that allows the conveyance of identity and authentication information across a set of networked systems.

- NIST SP 800-63-3



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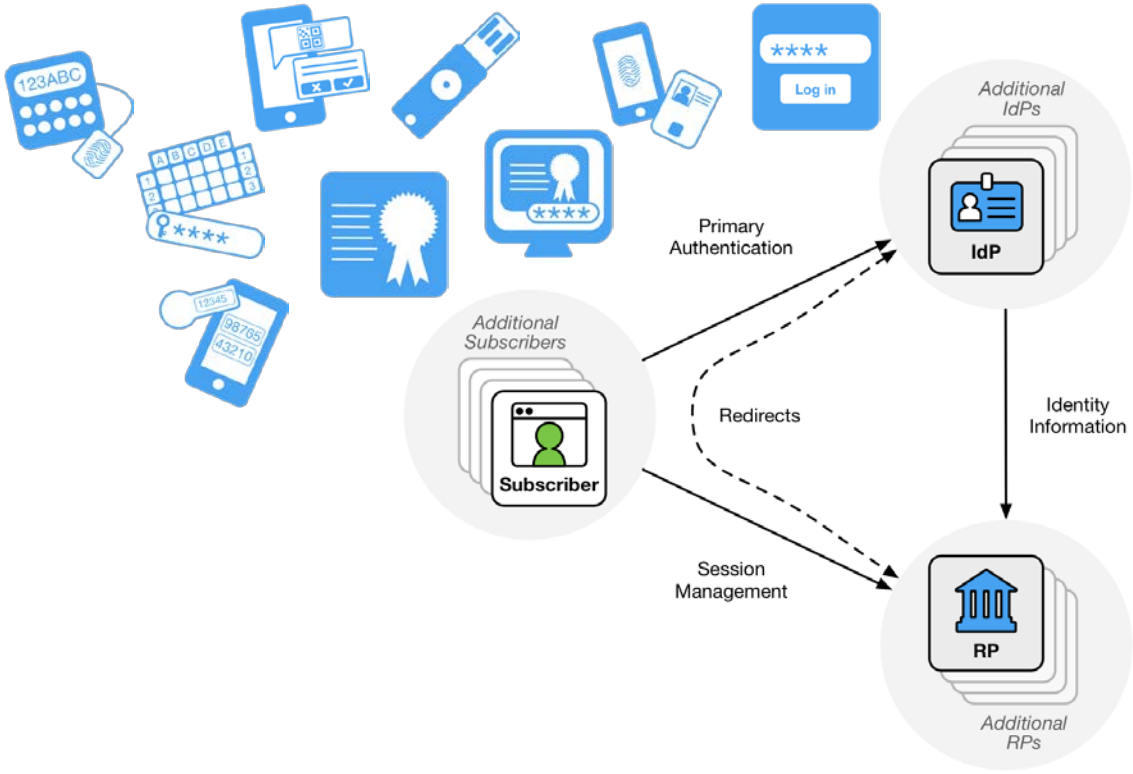
Why federate?

- Abstraction layer for authenticators
- Attribute disclosure
- Timeliness of assertions/attributes
- Cross-boundary acceptance and use
- Relying Party maintains control of sessions

Abstraction layer across authenticators



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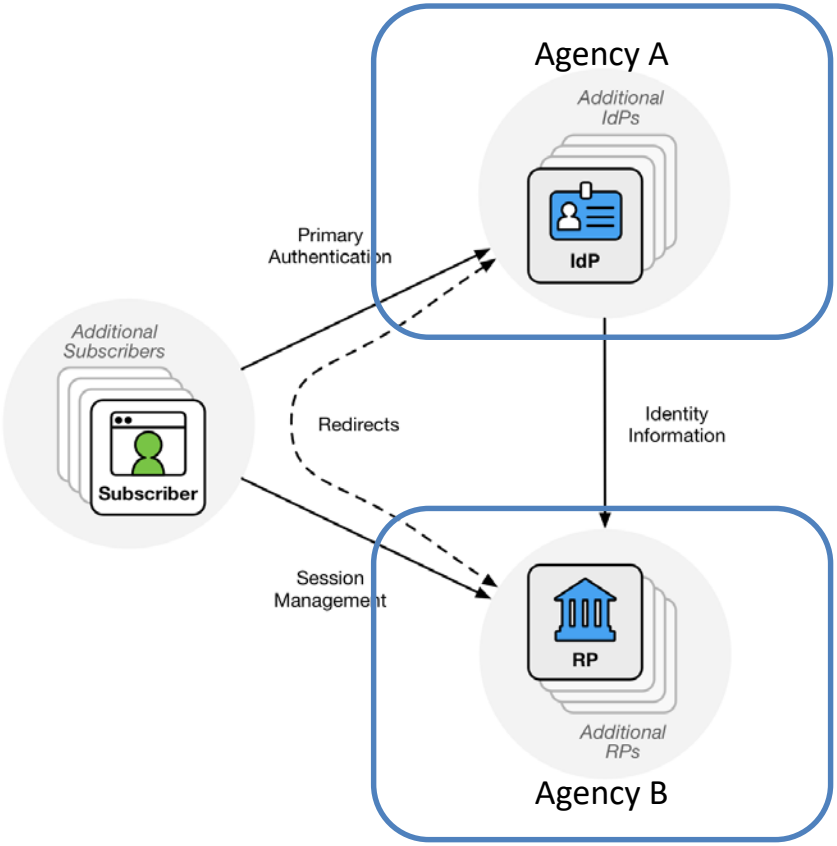
Can cross boundaries



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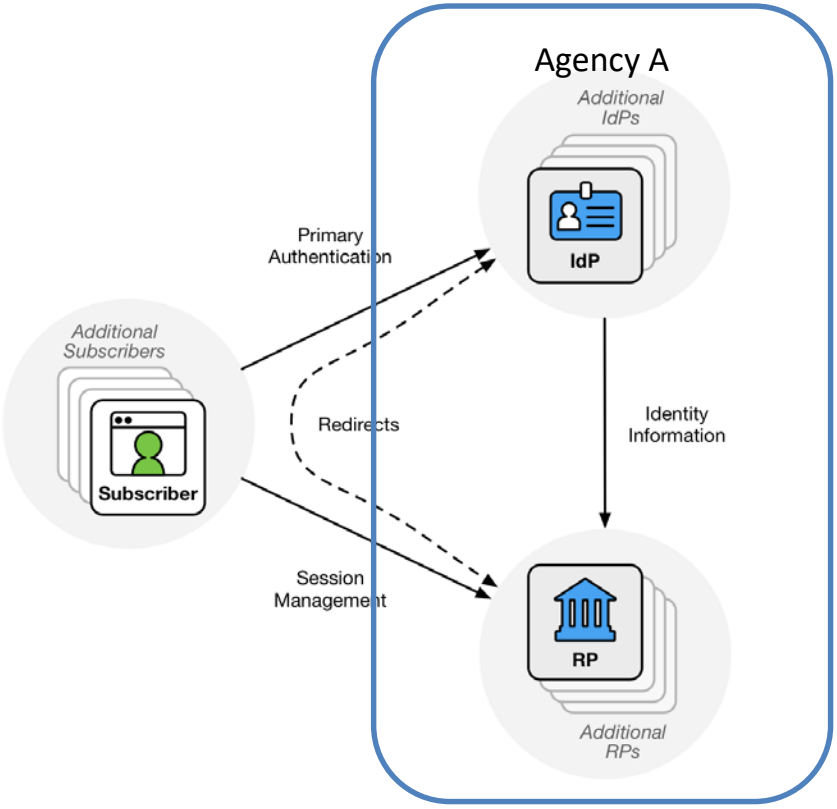
Can work internally



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Federation Assurance Level (FAL)

	FAL1	FAL2	FAL3
Assertion type	Signed	Signed & Encrypted	Signed, Encrypted, & Holder-of-Key
Subscriber attributes	Yes (if backchannel)	Yes	Yes
Examples	OIDC SAML artifact binding	OIDC with encrypted ID token SAML with encrypted assertion	OIDC or SAML plus secondary key-based authenticator (certificate, FIDO, etc)

- **FAL1 is good for most use cases**
  - Requires signatures, audience restriction, replay protection, etc.
  - Especially when subscriber attributes are sent in the backchannel, separate from the assertion
- **FAL3 requires token binding and/or client authenticated TLS**

Federation protocols

- OpenID Connect (OIDC)
  - Supports browser and mobile
  - iGov profile from OIDF
- Security Assertion Markup Language (SAML)
  - Profile available for browsers
  - eGov profile from Kantara

In Closing

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Looking Ahead…

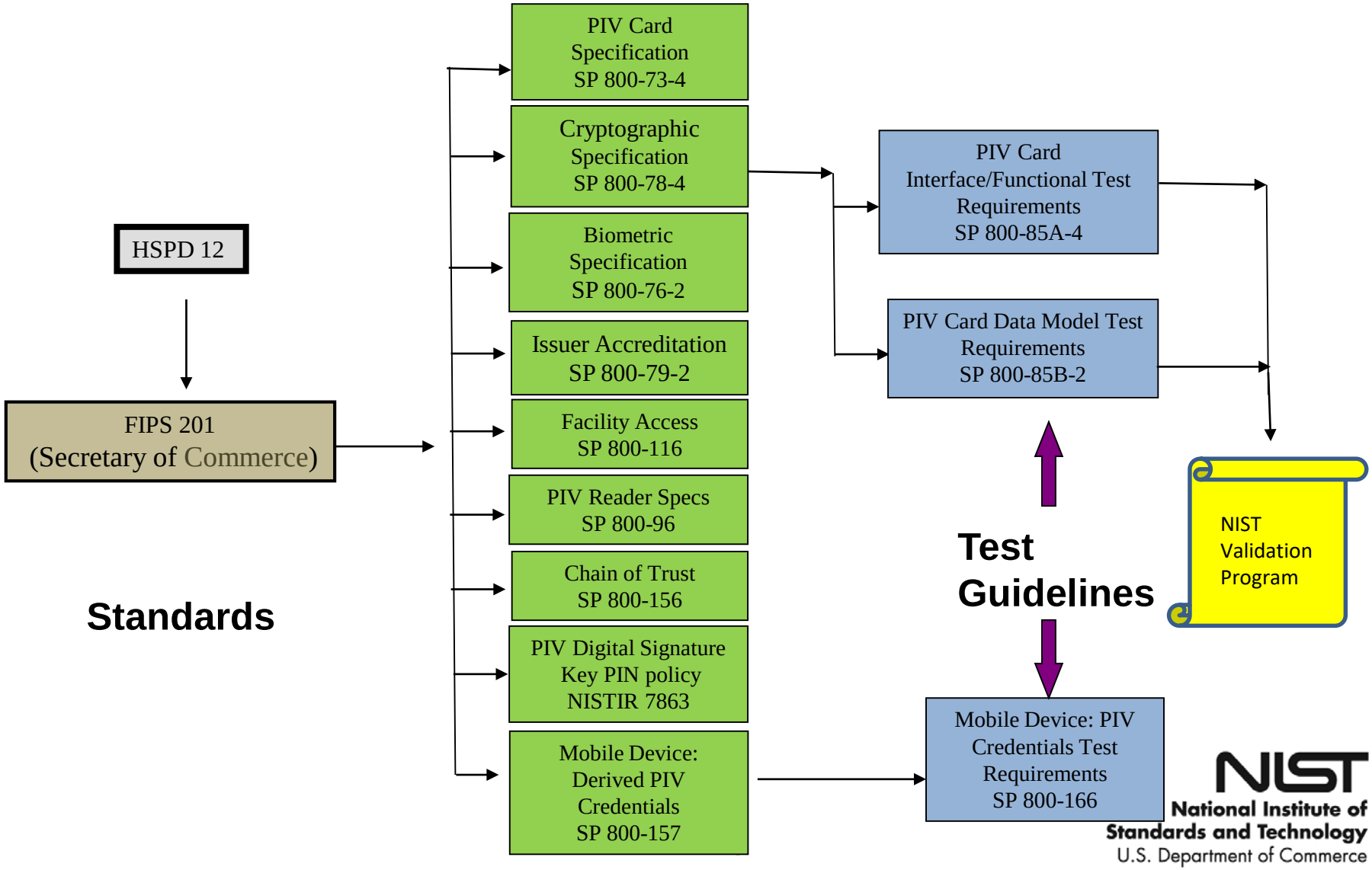
- No major re-write of FIPS expected. Focus should be in amending/adding high level context/requirements in the major topic area (change requests)

- Major effort should concentrate on technical updates to NIST Special Publications for the major topic areas, while shepherding FIPS 201 through the revision fairly quickly.
  - SP development/edits will follow FIPS development

FIPS 201 Overall Process

- Top Down Approach
  - HSPD-12 -> FIPS 201 -> SPs
- FIPS specifies high level processes and requirements to satisfy HSPD-12
  - Supporting Special Publications (SP) detail the technical ‘how-to’

FIPS 201 Overall Process



Tentative Timeline/Milestones

Project Milestone	Date
Government-only Business Requirements Meeting	March 2019
Draft updates to FIPS 201 materials	~November 2019
Workshop	~December 2019
2nd Draft package (if needed)	April 2020
2nd Draft Workshop (if needed)	May 2020
Final Package	August 2020
Associated Special Publication update/create complete	May 2021

HSPD-12 Steering Committee

- OMB
- GSA
- DoD
- DHS
- DoJ
- Participants by invitation depending on the topic of discussion

Committee::

- Consists of representatives from federal department/agencies with a role specified in HSPD-12.
- Gives high level directions/goals on the revision within the scope of HSPD-12.
- on-going meeting as needed as direction adjust based on business requirement meeting / comments received.
- Review/Agree on Draft and Finals to be published

Questions?

Contact Information

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