# Personal Identity Verification For Federal Employees and Contractors

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# Basis for Requirements

HSPD-12: Policy for a Common Identification Standard for Federal Employees and Contractors

# Personal Identity Verification Requirements

## HSPD-12: Policy for a Common Identification Standard

Secure and reliable forms of personal identification:

- Based on sound criteria to verify an individual employee's identity
- Is strongly resistant to fraud, tampering, counterfeiting, and terrorist exploitation
- Personal identity can be rapidly verified electronically
- Identity tokens issued only by providers whose reliability has been established by an official accreditation process

# Personal Identity Verification Requirements

- Applicable to all government organizations and contractors
- To be used to grant access to Federally-controlled facilities and logical access to Federally-controlled information systems
- Graduated criteria from least secure to most secure to ensure flexibility in selecting the appropriate security level for each application
- Not applicable to identification associated with national security systems
- To be implemented in a manner that protects citizens' privacy

# Personal Identity Verification Requirements

## HSPD: Policy for a Common Identification Standard

- Departments and agencies shall have a program in place to ensure conformance within 4 months after issuance of FIPS
- Departments and agencies to identify applications important to security that would benefit from conformance to the standard within 6 months after issuance
- Compliance with the Standard is required in applicable Federal applications within 8 months following issuance

# Personal Identity Verification Threats

General Threat: Unauthorized access to physical facilities or logical assets under the protection umbrella of the PIV System and in which a PIV card is employed in access control processes.

- Improper issuance of valid card to malicious holder

- Counterfeiting of cards
  - Intercept or probing to access stored information
  - Successful cryptanalytic attacks against stored protected information

- Use of stolen or borrowed card to gain access
  - Intercept/technical surveillance to capture PIN(s)

- Use of card issued for access to lower sensitivity/criticality assets to achieve access to more sensitive/critical assets

# Representative Countermeasures

- No single mechanism adequate with respect to postulated threats
- No completely foolproof answer
- Can make improvements over current situation

# Some Representative Countermeasures

## Improper Issuance of Valid Card to Malicious Holder

Use of source documents [Note: notoriously weak “proof” of ID]

Application made only by accredited sponsor

Formal review and approval of application

Inclusion of source document copies with application

Display of source documentation to issuer by “holder” at time of issuance

# Some Representative Countermeasures

## Counterfeiting

Holographic organizational seal of issuer and/or other issuer ID hologram integrated into card

ID or Serial number burned into chip

Digital signature by issuer of all stored identifying information

Encryption of stored identifying information

Mechanism for checking holder ID and card ID or serial number with issuer records

Integration of PIN (not recorded on card) with cryptographic authentication process

# Some Representative Countermeasures

## Use of Stolen (or Borrowed) Card to Gain Access

Card accountability procedures (e.g., reporting/publication of lost card lists)

Use of PIN(s) not recorded on card (e.g., in challenge/ response to counter use of lost cards)

Use of biometric input from card holder and verification at time of access request

Visual inspection of card holder image with image of person claiming to have been issued the PIV card.

# Some Representative Countermeasures

## Use of Card Issued for Access to Lower Sensitivity/Criticality Assets to Achieve Access to More Sensitive/Critical Assets

Electronic credentials for each level authorized

Color coding or pattern changes on physical card representing level(s) authorized

Local access authorization procedures

# FIPS Development Process

- Public Announcement on Intent/Scope
  - HSPD-12: Policy for Common Identification Standard for Federal Employees/Contractors
  - Federal Register Notice #1: Scope/Workshop
- Draft Standard: Applicability, Foundation, Scope, Specifications, Implementations
- Government and Public Comments Solicited
  - TIWG Review and Federal Register Notice #2
- Revision of Standard: From Comments
- Publication/Promulgation of Standard
  - Federal Register Notice #3 announcing Standard

# Phase I

## Personal Identity Verification Standard for Federal Government Employees and Contractors

- Promulgate Federal Information Processing Standard within 6 months
- Establish requirements for:
  - Identity Token (ID Card) Application by Person
  - Identity Source Document Request by Organization
  - Identity Registration and ID Card Issuance by Issuer
  - Access Control (Determined by resource owner)
  - Life Cycle Management

# Phase I (Continued)

## Strawman Design

- Integrated circuit card-based identity token (i.e., ID Card).
- Standard at framework level with minimum mandatory implementation for interoperability specified.
- Basis for specification of issuer accreditation and host system validation requirements .
- Basis for specification of ID card, data base infrastructure, protocols, and interfaces to card.
- Card/token issuance based on request by sponsoring government organization, I-9 Identity Source Documents, and background checks appropriate to access level, and approval by authorized Federal official.
- Biometric and cryptographic mechanisms.

# Phase I (Continued)

## Issue: Inclusion of Contactless Capability (ISO/IEC 14443)

- Physical Access Control – Permits moving enough people “through the gate” in a unit of time
- ICAO selected contactless technology for the next generation passport ICAO (for traveler authentication )
- State is using small numbers of contact cards for physical access
- FICC workgroup on physical access has selected contactless technology

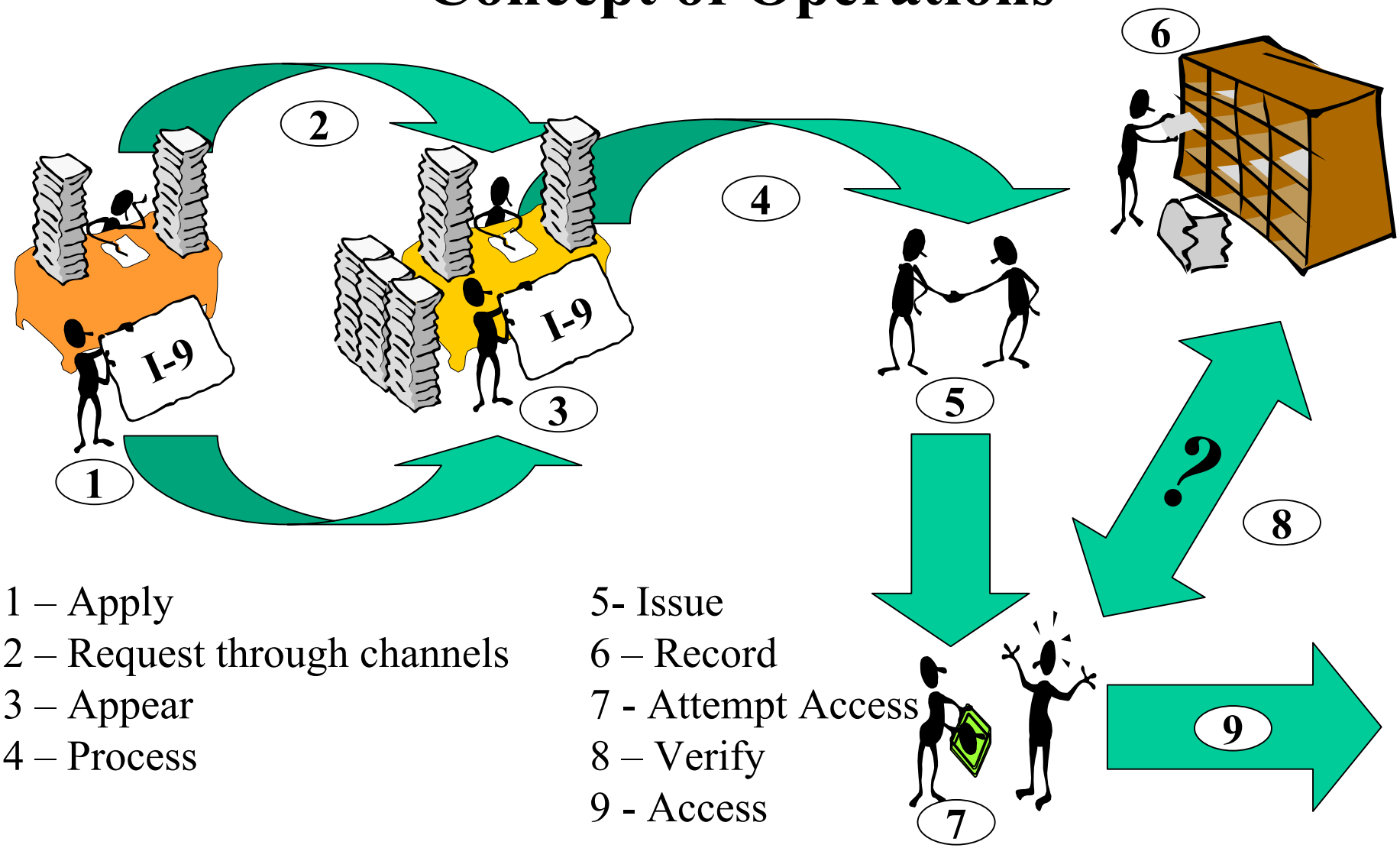
# Phase I (Continued)

## Issue: Inclusion of Biometric Data

- Biometric mechanisms equivalent to a PIN from a security architecture point of view
- User can't give away, lose, or forget his/her biometric
- Whether these features significantly improve the security of a given system is open to debate
- Some experts feel that a card + PIN provides the same assurance level as a card + biometric

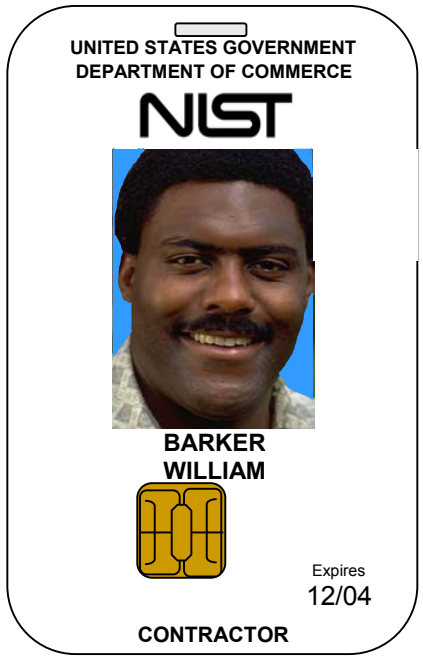
# Phase I (Continued)

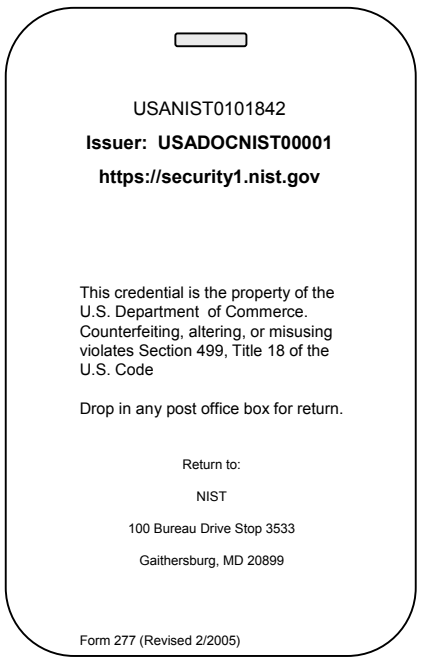
## Concept of Operations




1 – Apply
2 – Request through channels
3 – Appear
4 – Process

5- Issue
6 – Record
7 - Attempt Access
8 – Verify
9 - Access




# Phase I (Continued)

## Mandatory Card Characteristics

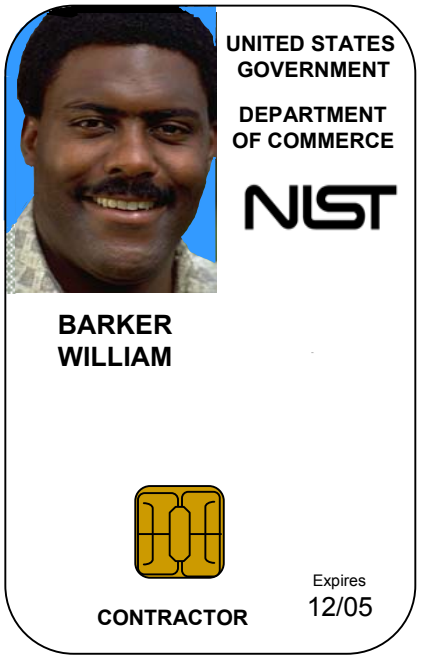
Basic:

ISO/IEC 7810 Physical Characteristics
ISO/IEC 7816 Contact Chip
ISO/IEC 14443 (Parts 1-4 Draft) Proximity Card
ISO/IEC 24727 (Future) Interoperability Specification
[NIST IR 6887]

Mandatory Features Specification*:

Cryptographic Specification (2048 Bit RSA, 256 Bit AES, SHA 256)
Fingerprint Image Specification
Photographic Image Specification

* Illustrative examples only




# Phase I (Continued)

## Mandatory Card Content

Electronic Content Digitally Signed By Issuer:

- Digital Photograph [ANSI.INCITS 385-2004]
- Digital Fingerprint Images (Left and right index) [ANSI/INCITS 381-2004 w/500 dpi resolution]
- PKI Certificate(s)
- User Identity (Card number? Issuer domain set? Signed?)
- Issuer Identity

Logic Elements:

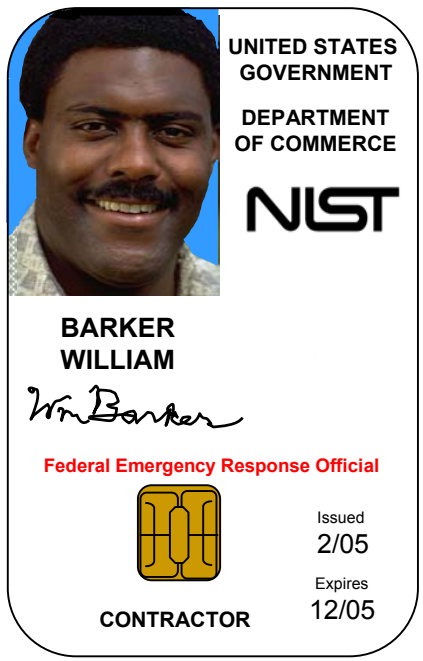
- Cryptographic Digital Signature
- Cryptographic Challenge/Response?
- Encryption/Decryption
- Key Variable Processing (PIN-based notarization?)
- Biometric Data Processing

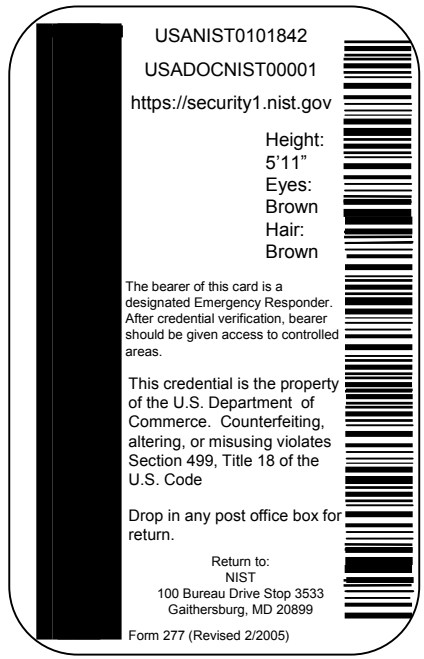
# Phase I (Continued)

## Optional Card Content

Electronic Content Digitally Signed By Issuer:

- Employee/Contractor Status
- Second Digital Photograph
- Ten Finger Digital Fingerprint Image
- Card Holder's Signature (Ties card to holder)
- Emergency Responder Designation
- Date of Issue
- Height
- Hair Color
- Eye Color



# Phase I Schedule

| | |
|---|---|
| **Delivery of Detailed Strawman Outline Components -** | **August 31, 2004** |
| **Finalize Technical Interagency Working Group Membership (TIWG) -** | **September 2, 2004** |
| **Announce First TIWG Meeting -** | **September 2, 2004** |
| **Announce Government Workshop -** | **September 3, 2004** |
| **Submit Public Workshop *Federal Register* Announcement -** | **September 3, 2004** |
| **Integration Meeting for Concept Draft Components -** | **September 3, 2004** |
| **Complete Strawman Content Proposal -** | **September 7, 2004** |
| **Distribute Concept to FICC IAB/TIWG Members -** | **September 8, 2004** |
| **Concept Comments to NIST for Review at First TIWG Meeting* -** | **September 14, 2004** |
| **First Meeting of TIWG -** | **September 15, 2004** |
| **Collect Initial Draft Component Submissions -** | **September 21, 2004** |
| **Completion of Working Group Comment Period -** | **September 22, 2004** |
| **Government-only Workshop Day -** | **October 6, 2004** |
| **Public Workshop Day -** | **October 7, 2004** |
| **Completion of Government Workshop Comment Period -** | **October 12, 2004** |
| **Assemble Preliminary Draft -** | **October 19, 2004** |
| **Completion of Public Workshop Comment Period -** | **October 21, 2004** |
| **Decision on Changes to Draft and Writing Assignments -** | **October 22, 2004** |
| **Completion of Public Draft of Standard -** | **November 8, 2004** |
| **Completion of Comment Period for Public Draft -** | **December 23, 2004** |
| **Completion of Revision of Standard -** | **January 13, 2005** |
| **Completion of Responses to Comments on Public Draft -** | **January 14, 2005** |
| **Delivery of FIPS Submission Package by NIST to DoC -** | **February 4, 2005** |
| **DoC Approval -** | **February 25, 2005** |

**Items on critical path are in boldface.**

*** External actions**

# Phase I (Concluded)

**Consequences of Failure to Accomplish the Task**

Non-compliance with the HSPD

- Continued lack of interoperability and mutual acceptance among Federal government badge-based facilities access systems and information system access control systems
- Consequent exposure to penetration of Federal facilities by terrorists and other criminals

# Phase II
## Implementation-Critical Support

- **Specification of Issuer Software**
  - **Biometrics capture**
  - **Capture, storage, and maintenance of textual information**
  - **Certificate acquisition and management**
  - **Digital signature**
  - **Certificate and cardholder revocation**
  - **PIN capture and use**
  - **Challenge/response programming**
  - **Card data access control**
  - **Issuer data access control**
  - **External interfaces**
- **Management of Software Development and Acquisition (Product by Agency)**
- **Issuer and Component Certification Management (Responsibility/Procedure)**
- **Assignment and Set-up of Inter-agency System Oversight/Management**
- **Coordination of Procurement Specifications (Conformance to Standard)**
- **Set-up and Management/Oversight of Certification Facilities**
- **Logical Access Security Configuration Recommendations/Guidelines (Including Applications)**
- **Establishment of Training Policies/Procedures/Responsibilities/Materials**

# Phase II (Concluded)

Development and Coordination of Standards for Implementing Specifications and Usage Guidelines

Consequences of failure to accomplish Phase II:

- Lack of early operational interoperability among Federal government identity verification activities due to varying implementations of the Standard
- Inability to validate initial implementations due to absence of conformance criteria and tests
- Potential delays in implementing the Standard

# Phase III

## Development and Coordination of Implementing Specifications and Guidelines

- Validation of Requirements and Refinement of Implementation Specification Tasks
- Implementation Standards,Guidelines, Reference Implementations and Conformance Tests
- Security Specifications
- Procurement Guidelines
- Multitechnology Implementation Guidance (to include component placement and physical topology)
- Identity Credential Card Creation and Lifecycle Management
- International Technical Specification Standards
- Secure Communications Protocol Standards

# Phase III (Concluded)

## Development and Coordination of Standards for Implementing Specifications and Usage Guidelines

Consequences of failure to accomplish Phase II:

- Failure to maintain interoperability among Federal government identity verification activities due to varying implementations of the Standard
- Inability to validate implementations/upgrades due to absence of conformance criteria and tests
- Potential failure to maintain security of implementations of the Standard
- Incompatibility of Federal implementation of additional applications with local and foreign government implementations
- Consequent inability to achieve intergovernmental interoperability

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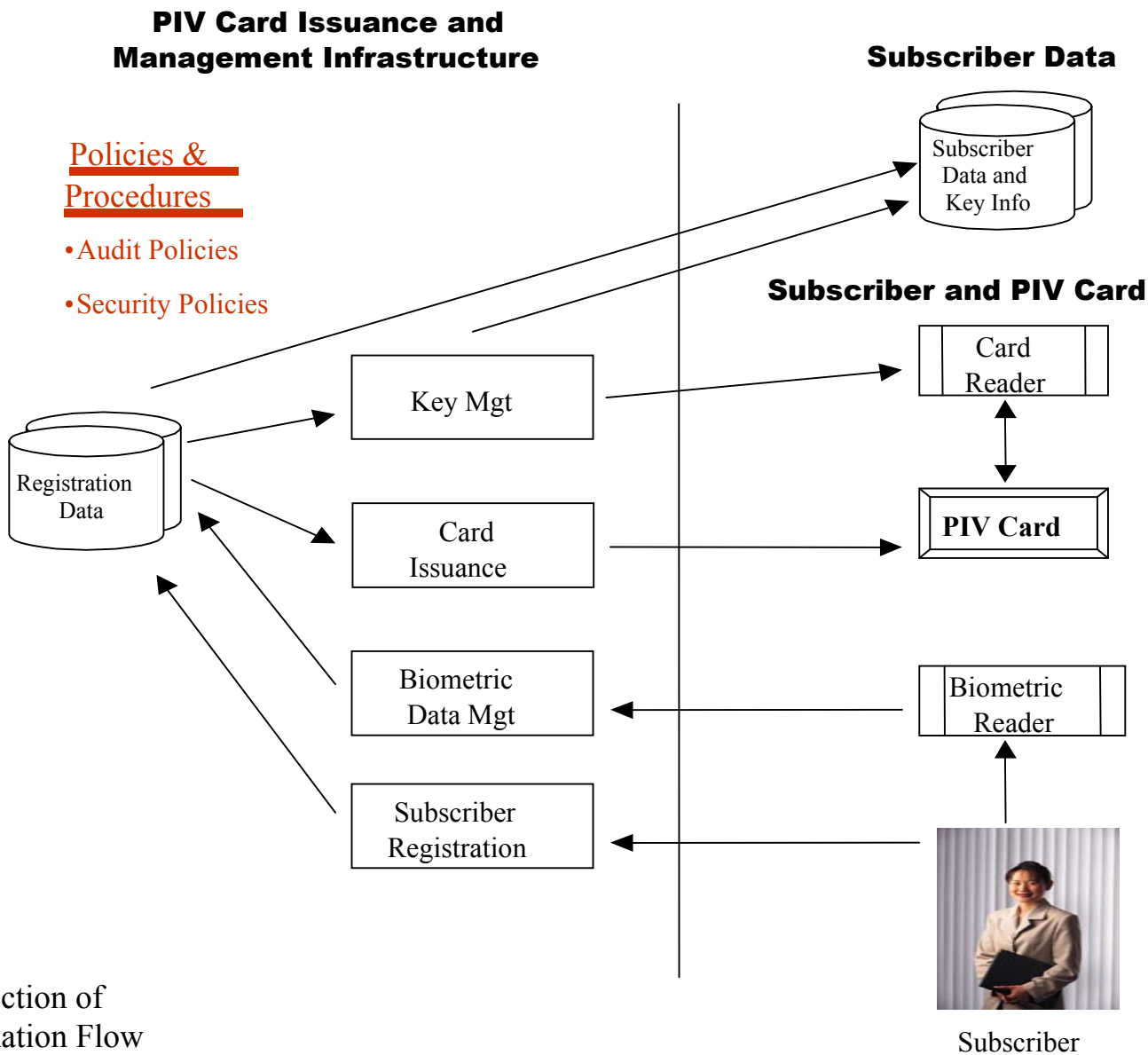
# Back-up

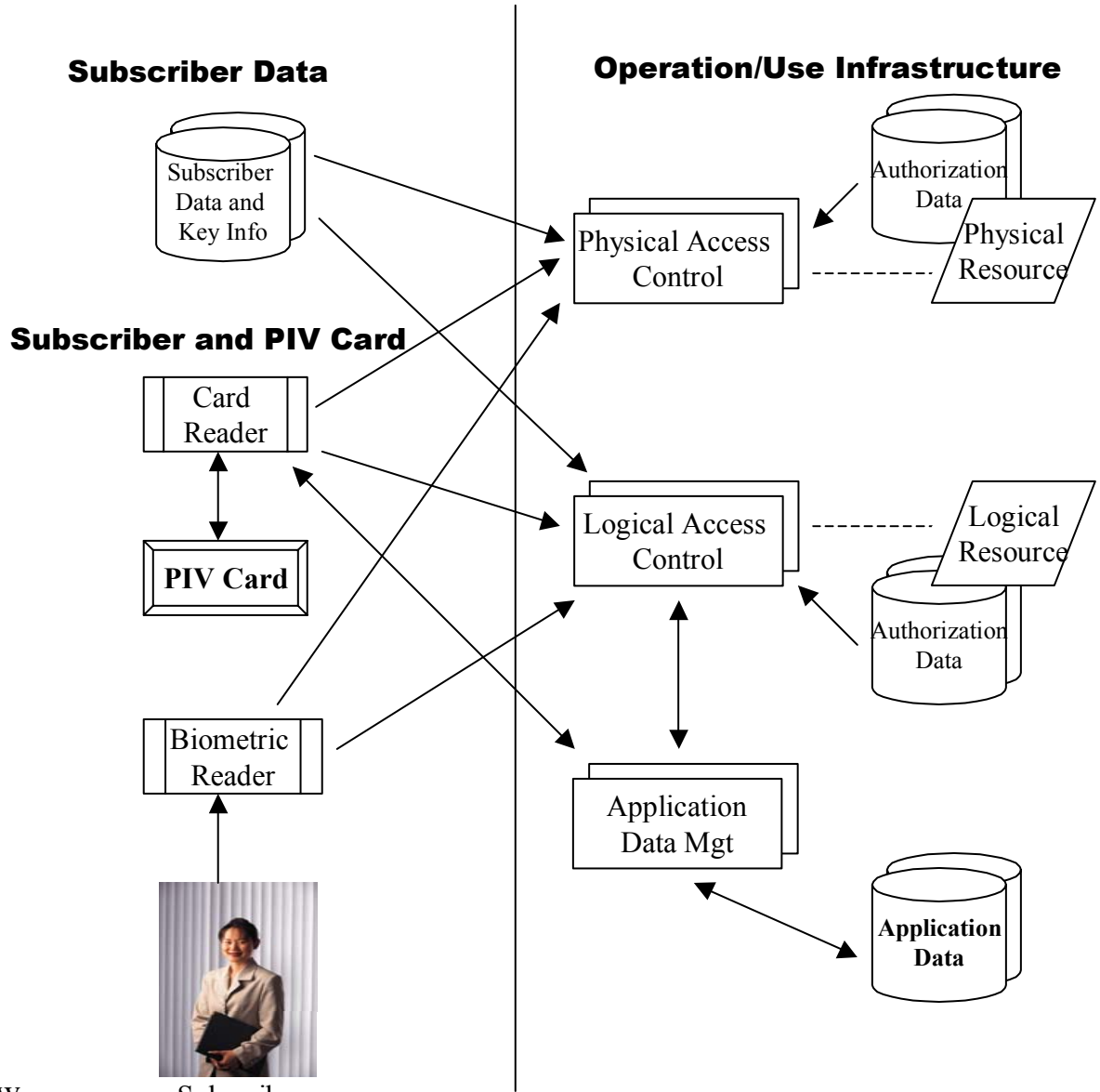
# PIV System Concept and Model

## PIV Card Issuance and Management

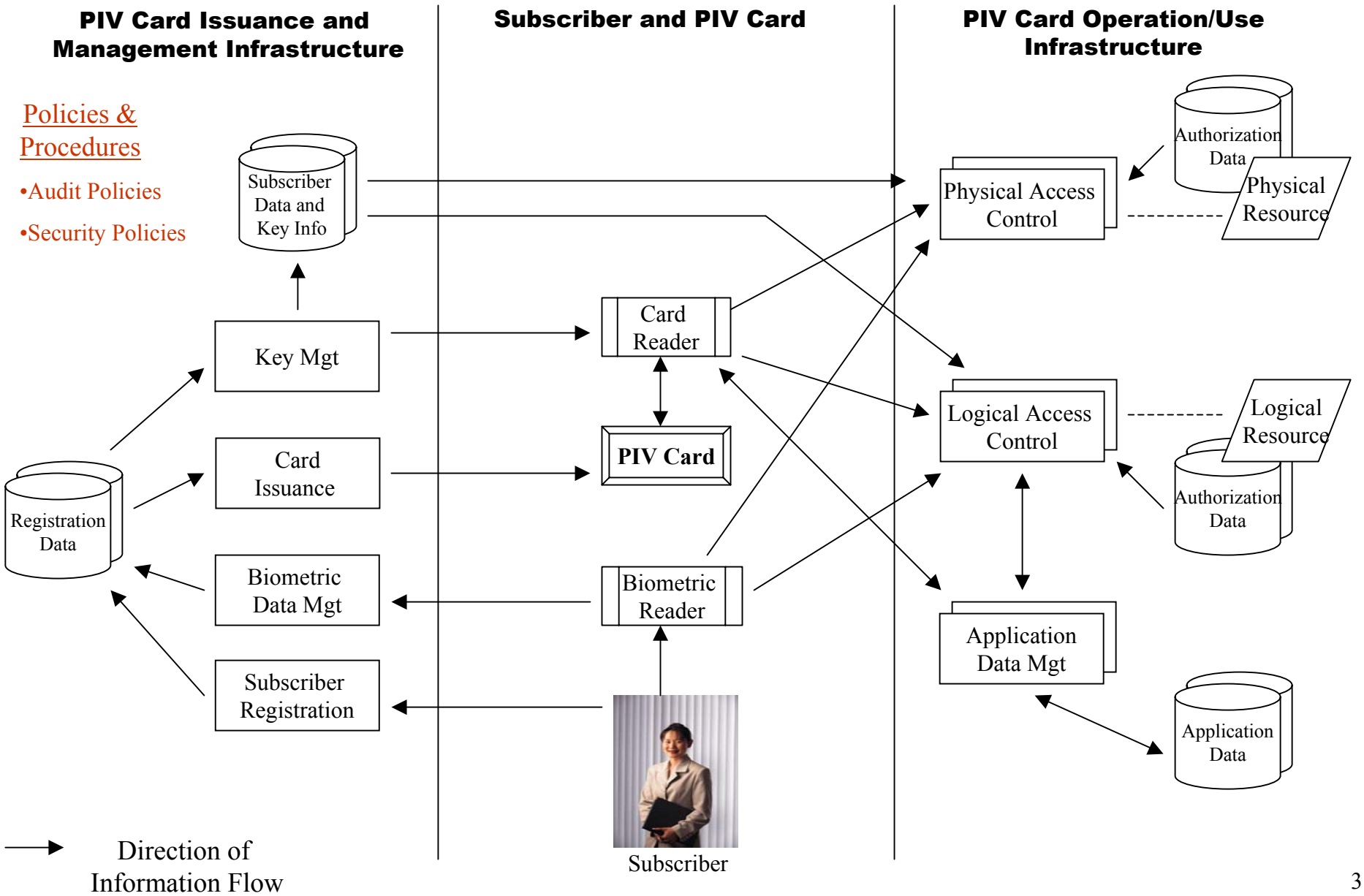


# PIV System Concept and Model

## PIV Card Operation/Use



# PIV System Concept and Model



# Phase I Process
## Application and Request

- Prospective recipient presents I-9 documents to parent organization (may require 10 finger flat fingerprint capture)
- Parent organization copies I-9 documents and prepares request for identity token
- Parent organization forwards copies of I-9 documents and the request to its management for approval
- Background check appropriate to access level
- Management approves request and forwards copies of I-9 documents and the request to issuing activity

# Phase I Process (Continued)

## Registration and Issuance

- Issuing organization establishes validity of request and approval.
- Issuing organization verifies that I-9 documents presented by prospective recipient match copies provided by requestor and physical appearance of prospective recipient.
- Issuing organization photographs and fingerprints prospective recipient and has prospective recipient enter a PIN.
- Issuing organization prepares and issues identity token
- Issuing organization enters issuance record into database

# Phase I Process (Continued)

## Access Control and Life Cycle Management

- Access control process determined by resource owner.
- Registration databases maintained by issuers as accessible by entities controlling access to resources.
- PKI Certificate management responsibility of issuers.
- Token replaced/re-issued periodically (5 years?).
- Revocation notification for exceptional circumstances (e.g., revocation with prejudice).