Authentication in the Cloud

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Agenda

- Definitions
- Approaches for Authentication
- Authentication in the Cloud
- Federated Identity
- Summary

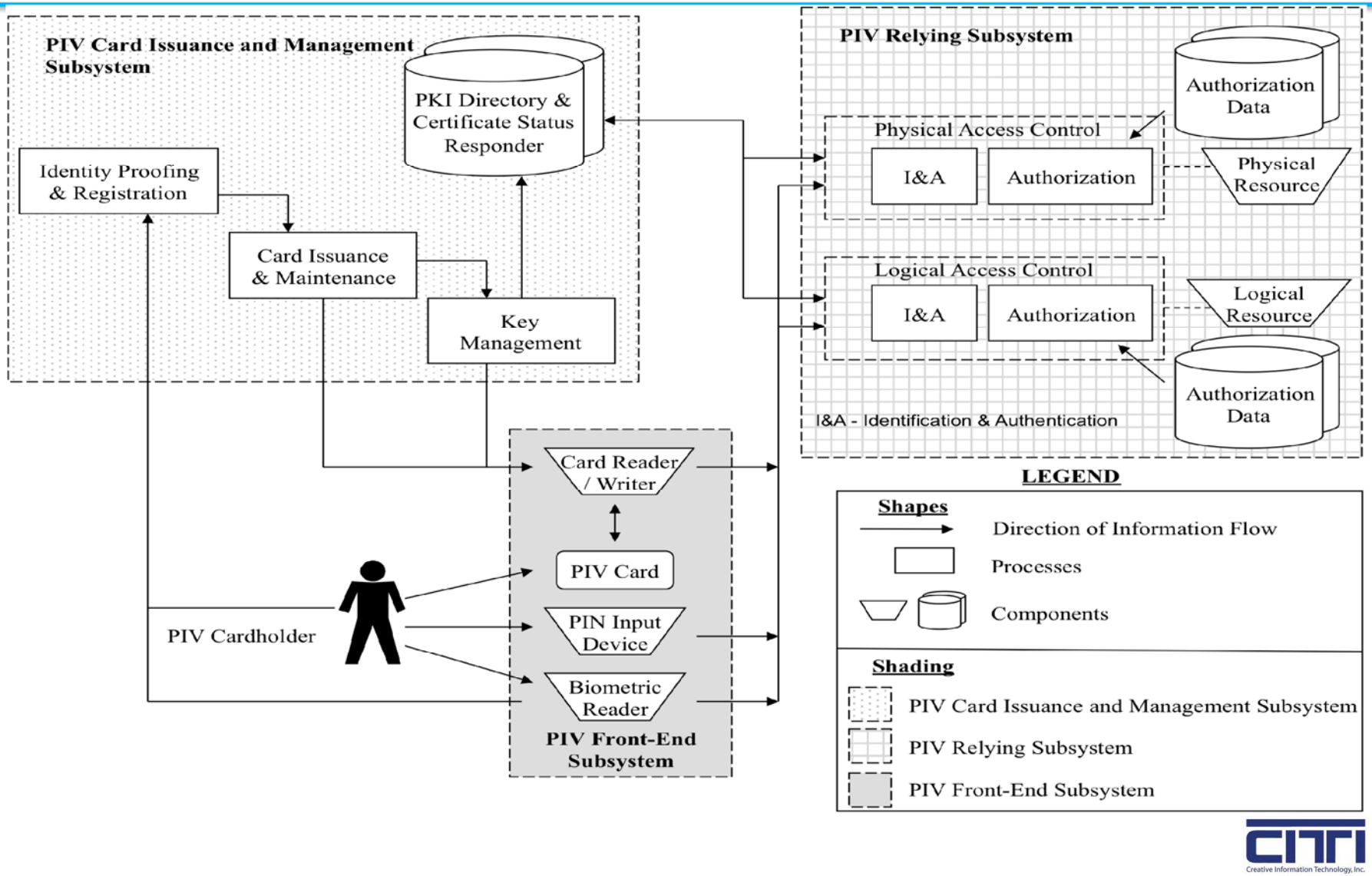
Definitions

- Authentication: Ensure that all individuals (or non-person entities) attempting access are properly validated
- Confidentiality: Ensure that all access to information is authorized
- Integrity: Protect information from unauthorized creation, modification, or deletion
- Nonrepudiation: Ensure the accountability of parties when gaining access and performing actions

Approaches for Authentication

- Something you know (Password, PIN)
  - Most common form of authentication
  - Can be forgotten
- Something you have (smart card, token)
  - Carry something with you, use it every time you want to be authenticated
  - Can be lost or stolen
- Something you are (fingerprint, iris)
  - Biometric; based on some physical or behavioral trait
  - Much harder to lose
  - If stolen, cannot be “replaced”

Example: PIV Card



Other approaches

- Multiform Authentication (MFA)
  - More than one form of authentication is used to verify the legitimacy of a person or transaction
    - PIN/Password, Soft/Hard tokens, SMS, etc.
  - Makes it more difficult for an unauthorized person to access resources
  - Examples: Google, Windows Azure, AWS, PayPal, etc.
- Risk Based Authentication
  - Additional factors of authentication used based on “risk”
  - Example 1: Online banking from an unrecognized computer
  - Example 2: Periodically (once a week or month)

Authentication in the cloud

- Much bigger problem than authentication in local workstations or within a network domain
- Multiple clouds and multiple applications means multiple passwords
- Some services use multi-factor and risk-based authentication
- Solution: Federated identities

Federated Identity

- Federated identity: Linking a person's electronic identity and attributes stored across multiple distinct identity management systems
  - A service or application does not need to obtain and store users' credentials in order to authenticate users
  - It can use another "trusted identity management system" to authenticate the user
  - Examples: Use your Facebook, Google, or Paypal credentials elsewhere
- Benefits:
  - Authorization and authentication are decoupled
  - The Relying Party still controls the authorization
  - Users need to remember fewer passwords
  - Higher level of PII (Personally Identifiable Information) security and protection

Federated Identity Standards

- SAML (Security Assertion Markup Language):
  - Developed in 2002 by the OASIS Security Services Technical Committee (SAML 2.0 was ratified as an OASIS Standard in 2005)
  - An XML-based open standard for exchanging authentication and authorization
- OpenID:
  - An open standard released in 2006
  - Over one billion OpenID enabled user accounts and over 50,000 websites accepting OpenID for logins
  - Several large organizations either issue or accept OpenIDs, including Google, Facebook, Yahoo!, Microsoft, AOL, Sears, France Telecom, Novell, Sun, Telecom Italia, and many more
- OAuth:
  - Open standard available since 2006 (OAuth 2.0 in 2012)
  - Allows apps to share information via APIs with the right level of authorization

FCCX

- The Federal Cloud Credential Exchange (FCCX) allows agencies to securely interact with a single “broker” to authenticate consumers

- Centralized interface between agencies and credential providers reduces costs and complexity
- Enhanced consumer privacy and experience; user does not have to get a new credential for each agency application
- Decreased Federal government authentication costs

Summary

- Authentication: Ensure that all individuals (or non-person entities) attempting access are properly validated
- Approaches for Authentication
  - Something you know (Password, PIN)
  - Something you have (smart card, token)
  - Something you are (fingerprint, iris)
- Multiform Authentication and Risk Based Authentication further improve authentication, confidentiality, integrity, and non-repudiation
- Authentication in the Cloud is complicated by the number of passwords, tokens, etc. one needs to remember and manage
- Federated Identity significantly improves authentication in the cloud

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