Mobile Derived Credentials for Assured Identity within DoD

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Agenda

- DoD Vision for Assured Identity
- Security Concerns and Mitigations for Mobile Computing
- Derived PIV Credentials for “Assured Identity”
- Wrap-Up

DoD Vision for Assured Identity (I)

- **DoD has issued over 2.8M Common Access Cards (CACs) since 2001; however, the CAC:**
  - ***Is not practical in tactical/constrained environments***
  - ***Is cumbersome to use with mobile devices***
  - ***Does not enable secure interoperability with mission partners***

- **FedForum 2016 (Jun'16) - DoD CIO Terry Halvorsen stated:**
  - ***CAC lacks agility; will be phased out over next 2 years***
  - ***CAC will not be used for access to information systems***
  - ***Continue PKI and Multi-factor authentication using***
    - **Biometrics**
    - **Behavior-based techniques**
    - **Personal data**

DoD Vision for Assured Identity (II)

- **Aug 2016 – DoD IT & Cybersecurity Roadmap released**
  - ***2-year plan to eliminate CAC from DoD information systems***
  - ***Deploy authentication infrastructure to dynamically control authorized user access***
  - ***Integrate commercial mobile IT capabilities***

- **April 2016 – DOD Mobility Strategy - Kim Rice, PM, Mobility PMO**
  - ***Enable Personnel to securely work in any location, over any device across any network***
  - ***Allow use of Various Devices (laptop, smartphone, tablet …)***
  - ***Promote availability of applications developed specifically for small, wireless computing devices***

Security Challenges with Mobile Devices

- **Small form factor makes it easy to lose, misplace**
- **Device passwords seldom enabled**
- **Multiple channels of attack and access**
  - ***Poorly secured communication channels (e.g. WiFi)***
- **Complexity and proprietary nature of Mobile OS**
  - ***Multiplicity of Mobile OS versions in the field***
  - ***Patches and updates implemented sporadically***
- **Plethora of mobile apps**
  - ***Ease of quick download and use of malware***
  - ***Difficulty of source verification and integrity checks***
- **Ease of unauthorized OS modification (e.g. "jailbreak")**

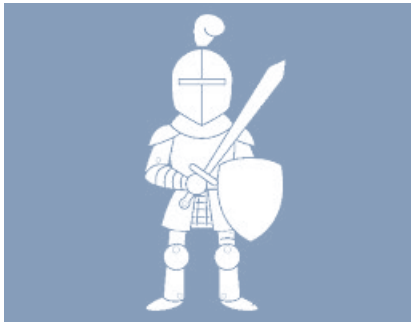
*** Reference: 2012 GAO Report "Better Implementation of Controls for Mobile Devices Should Be Encouraged"**

Mobile Device Attack Paths

- Attacker gains physical control of device
- User visits malicious website
- User download Apps from web (other than from reputable source)
- Attacker eavesdrops on unencrypted communications from device

Securing Mobile Devices – User Controls

- Maintain physical control of device
- Enable user authentication to device
- Use 2-factor to protect sensitive transactions
- Limit use of insecure communication channels
- Download Apps from reputable sources only
- Install security software – firewall, anti-malware
- Install security updates promptly
- Enable remote wipe of data



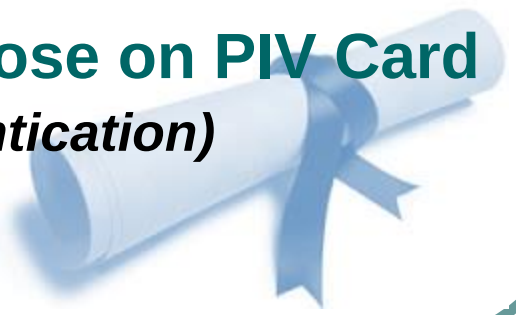
*** Reference: 2012 GAO Report "Better Implementation of Controls for Mobile Devices Should Be Encouraged"**

Securing Mobile Devices - Agency Controls

- **Establish / Implement Mobile Device Security Program**
  - ***Security Policy***
  - ***User Training***
  - ***Deployment Plan***
- **Implement layered security for mobile device**
  - ***Authentication to device***
  - ***Cryptographic protection of data and transactions***
  - ***User training and awareness of security risks***
- **Implement Mobile Device Management (MDM) solution – Server and Client App(s)**
  - ***Run in the background***
  - ***Run in "sandboxed" environment***
  - ***Manage the security configuration of device***
  - ***Implement 2-factor techniques***
  - ***Encrypt stored data***

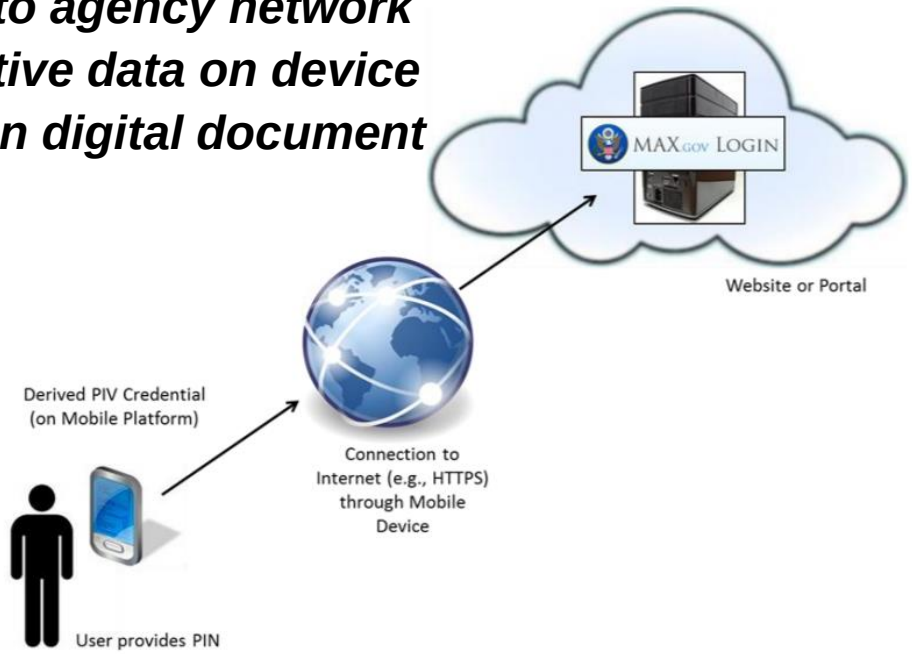
What are Derived PIV Credentials?

- **Specified in NIST Special Publication 800-157**
  - ***Final version published December 2014***
- **A security token, implemented and deployed directly on a mobile device (such as smart phone or tablet)**
- **Issued to holder of a valid PIV Card**
  - ***Trust derived from authenticated possession of PIV Card***
  - ***Identity proofing and vetting not necessary***
- **Set of PKI credentials similar to those on PIV Card**
  - ***PIV Authentication (for identity authentication)***
  - ***PIV Signature (for digital signature)***
  - ***PIV Key Management (for encryption)***



How are Derived Credentials Used?

- **With secure Apps <u>on</u> mobile device**
  - ***Secure Browsing with 2-factor authentication***
  - ***Secure email send and receive (encrypt/sign)***
  - ***IPSEC-based VPN tunnels to agency network***
  - ***Strong encryption of sensitive data on device***
  - ***Sign and verify signature on digital document***



- **Currently, not for use with separate platform (e.g., laptop)**
  - ***Contactless connection to platform not supported***

Derived PIV Credential Implementation

- **Where Derived Credentials are stored/used in Mobile Device:**
  - ***Removable (non-embedded) Hardware Crypto Token (LOA-4)***
    - **Secure Digital (SD) Card**
    - **Universal Integrated Circuit Card (UICC)**
    - **Universal Serial Bus (USB) Token**
  - ***Embedded Crypto Token***
    - **Hardware implementation (LOA-4)**
    - **Software Implementation (LOA-3)**
- **Who can issue**
  - ***Any Agency that issues PIV Card***
  - ***Other Agency***

Derived PIV Credentials - Life Cycle (I)

- **Initial Issuance**
  - ***Subscriber proves possession/control of valid PIV card***
  - ***Issuer checks that PIV Card is not revoked***
  - ***Derived PIV credentials issued to mobile device***
    - **LOA-3 – may be issued through remote session(s)**
    - **LOA-4 – must be issued in person; biometric authentication reqd.**
  - ***Multiple Derived Credentials may be issued to same PIV Cardholder***

- **Derived Credential Maintenance (Rekey, Revoke, Reissue)**
  - ***Can be done remotely or in-person***
  - ***Derived PIV credentials usable even if PIV Card is lost / revoked***

Derived PIV Credentials - Life Cycle (II)

- **Termination**
  - ***When Derived PIV credentials no longer needed***
  - ***When PIV Card is terminated***
- **Linkage with PIV Card to be maintained**
  - ***Active and periodic checks with PIV Card Issuer for termination/change***
  - ***Linkage updated when Subscriber gets new PIV Card***

Assured Identity with Derived Credentials

- **Enables initialization of mobile devices for secure use by Federal mobile worker**
  - ***Agency-issued device***
  - ***Personal device (BYOD)***

- **Challenges**
  - ***Policy with regard to Derived Credential Issuance/Mgmt***
  - ***Secure Remote enrollment and provisioning***
  - ***Maintaining active link to underlying PIV Card***
    - **Update/Terminate in lock step with PIV Card**
  - ***Use in contactless environments (laptop, physical access point)***
  - ***Use with Mobile Device native apps***

Wrap-Up

- **Summary**
  - ***Secure Mobile computing a core part of future DoD IT***
  - ***Mobile security challenges need to be addressed***
  - ***Derived Credentials offer strong foundation for assured identity***
  - ***Multiple use cases to leverage Derived Credentials***

- **Questions / Comments ?**

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- **About Electrosoft**
  - ***We deliver a diversified set of technology-based solutions and services with a deep focus on cybersecurity***
  - ***We co-authored over a dozen NIST security publications!***
  - ***Major Customers: DoD, GSA, Treasury, VA, DHS***
  - ***Founded in 2001; Headquartered in Reston, Virginia***
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