PV204: Project Presentation

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Overview

- JPass: the Opensource application
- Applet Design
- PC Application
- Security Analysis
- Conclusion

JPass: the Opensource application

1. Password Manager
2. *https://github.com/gaborbata/jpass*
3. Functionalities:
   - Creation/generation of passwords
   - Organize username, password, URL
   - Import/Export in XML
   - User Verification
   - Change PIN
   - Save /Open file

JPass: Features Targeted

1. User verification through smart card (PIN)
2. Password generation in smart card
3. Storage of passwords in smart card
4. Other attributes URL, ID can be stored in JPass (secured way)

Applet Design

1. User authentication
2. Change user PIN
3. Generate Passwords
4. Store passwords
5. Password Retrieval
6. Update/delete password

PC Application

1. User authentication
2. Change user PIN
3. Generate passwords request
4. Save passwords
5. Retrieve passwords
6. Update/delete password

Communication Security

Attacker Model

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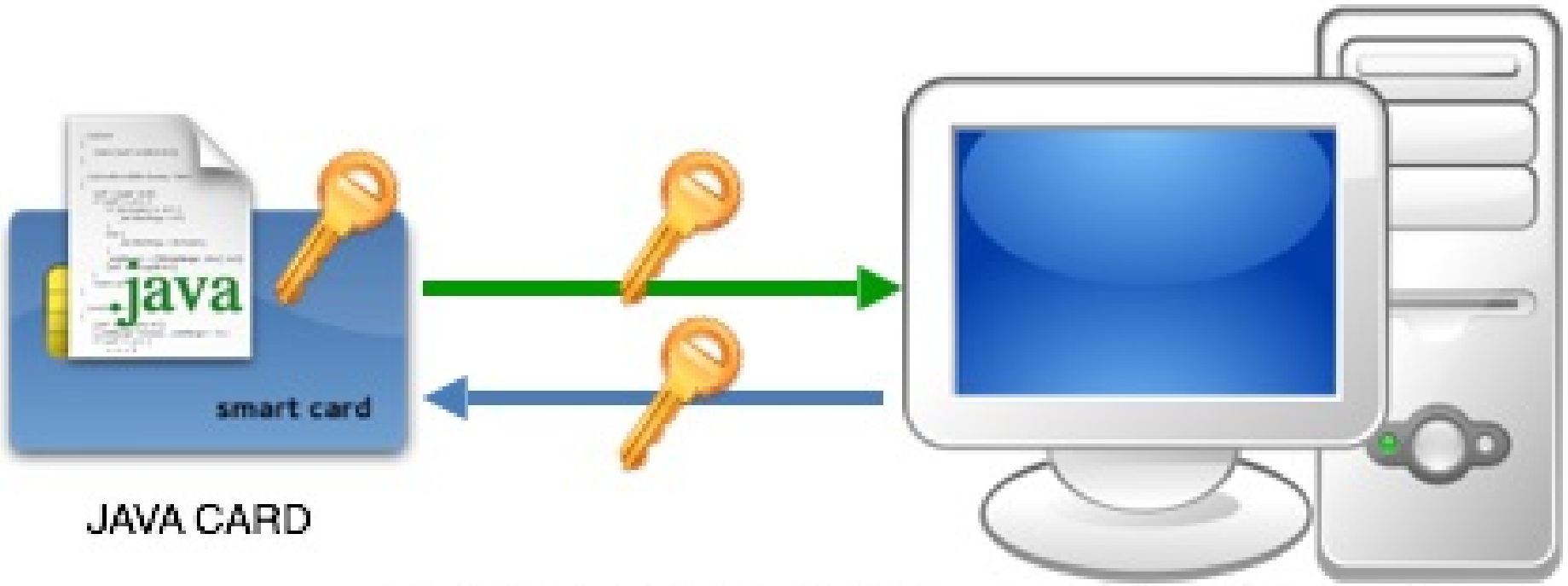
4. Modify and send data to the smart card of PC application
   $\Longrightarrow$ attacker can try to authenticate to smart card
   $\Longrightarrow$ send arbitrary commands to smart card
   $\Longrightarrow$ try to get data leaked from pc application or smart card

Security Mechanism



Security Mechanism:Session Key Derivation

1. Session Key Derivation:
   - Generate a salt (random number) in smart card
   - Session key hash (PIN + random number)
   - Different session key for every session due to salt
   - PIN acts as master secret which can be changed based on some policy
2. Freshness of data
   - applet and PC application use nonce to ensure it

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4. Modify and send data to the smart card of PC application
   - $\Longrightarrow$ Any modification of encrypted data would destroy it and can be rejected
   - $\Longrightarrow$ Use HMAC to ensure the integrity of data

THANK YOU