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LUZERN

# NFC Research Projects at HTA Lucerne

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#### **About Us**

University of Applied Sciences of Central Switzerland

- 900 students (6 fields of study)
- 100 researchers
- Research turnover 8 Mio CHF/y
  - 75% external funding
  - 125 projects/year
  - Project duration: 3-48 month





- NFC Terminals
- SmartOK
- Physical Access Control
- Second Secure Channel



#### **NFC Terminal**

- Project start: January 2006
- Goal
  - Replacement of existing reader terminals
    - Mifare
    - ISO 14443a/b
    - Felica
    - ISO 15693
  - Adding NFC support for new use cases
  - One terminal for all standards
  - Seamless integration in existing system





#### **NFC Terminal**

- Problems we encountered
  - No finished/available reader chip that supports NFCIP-2 (customer requirement)
  - Communication between reader and NFC enabled device
    - Incompatible implementation
    - Beta versions of reader chips
    - Buggy development kits
  - Conclusion
    - To early, technology wasn't ready





- NFC Terminals
- SmartOK
- Physical Access Control
- Second Secure Channel



## **SmartOK – Mobile Authentication**

- Project start: June 2006
- Goals
  - Easy to use authentication
  - Bidirectional interaction with user (C-R)
  - Multiple "OK" support
- Result
  - Prototype that shows the concept





- NFC Terminals
- SmartOK
- Physical Access Control
- Second Secure Channel


## **Physical Access Control**

- Goal
  - Add NFC enabled mobile phone to existing infrastructure (as replacement for smartcards)
- What we did
  - Applet on the smartcard chip (SIM or smartMX) of the mobile phone – remote deployment
- Results
  - Easy to develop
  - Known technology
  - Not as fast as other smartcards





## **Physical Access Control**

- Existing Infrastructure
  - Reader Terminal
    - SmartCard for Access Control
- New Infrastructure
  - New Reader Terminal
  - SmartCard for Access Control
  - Mobile Phone for Access Control







- NFC Terminals
- SmartOK
- Physical Access Control
- Second Secure Channel

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## **Second Secure Channel**

- Project start: January 2007
- Secure authentication needed for
  - E-Banking
  - VPN
- Problems today
  - Separate devices for each access (e.g. SecureID)
  - No personal relation to the device

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## **Second Secure Channel**

- Secure Token
  - NFC enabled mobile device
- Advantage
  - One device for everything
  - No Transcription
  - Personal relation to the device
  - Disadvantage
    - single point of failure







## **LEGIC – All-in-one Mobilephone**

- Payment / Access with NFC-enabled Mobilephones
- Presentation at CeBIT 2007







#### Pressemitteilung

Unternehmensnachrichten - Contactless Smart Cards

15. März 2007

#### Türen öffnen und Getränke bezahlen – mit dem Handy

Weltpremiere auf der CeBIT 2007 – Kontaktlose all-in-one card Anwendungen von LEGIC in NFC-Mobiltelefone integriert

Stellen Sie sich vor, Ihr persönliches Mobiltelefon wäre die Eintrittskarte zum



### **Projects in discussion/preparation**

## Flexible online/offline licensing



 "Paper chase" for tourist office





#### Conclusion

- Huge potential for applications
- Great customer interests
  - but few project contracts
- NFC <-> RFID
- Standardization
- NFC Alternatives
- Availability of devices/chips
- Early adopter problems



