Automated Border Control based on (ICAO compliant) eMRTDs

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Outline

- Update on EasyPASS
  - Operational experiences/figures
- EasyPASS PLUS pilot project
  - Support for the new German ID card
  - Background infrastructure (EAC PKI)
- ABC in Europe
  - ABC installations
  - Frontex ABC guidelines
EasyPASS – overview

- ABC system operated by the German Federal Police
- Located at Frankfurt Airport
- 4 self-service eGates, 1 monitoring station
- Open for citizens from 31 European countries (18+ years old)
- Timetable
  - Start of operation was in August 2009
  - Pilot phase until March 2010
  - Since April 2010 regular operation
EasyPASS – system architecture

- Software integration platform BioMiddle
  - Modular and platform independent architecture for biometric applications
  - Standard interfaces and protocols (SOAP, BioAPI 2.0, ISO/IEC 19794-x, etc.)
  - Allows for an easy integration of document readers, biometric components and background systems

- Image acquisition
  - Integration of camera via BioAPI Capture BSP
  - Internal pre-qualification regarding ISO19794-5

- Face verification
  - Different face comparison algorithms for the pilot phase, each integrated as BioAPI Verification BSP
EasyPASS – operational figures (1)

- ≈ 500 users passing through EasyPASS per day
- 88% success rate
  - border crossing without manual interaction
- 12% operational reject rate
  - additional manual inspection by border guard
  - ≈ 5% rejected due to face verification failed
    - @ ≈ 0.1% FAR (False Accept Rate)
  - ≈ 7% rejected by the system due to other reasons
    - non compliant user behaviour
    - document check failed
    - hits from background database checks
EasyPASS – operational figures (2)

- \( \approx 18 \text{ sec.} \) average time period to pass the eGate
  - Time from presenting the ePassport on the DocReader until the system is ready to process next traveller

- Average time periods for main sub-processes
  - \( 5 - 6 \text{ sec.} \) for Reading and checking ePassport data (optical and electronic checks)
  - \( 5 - 6 \text{ sec.} \) for the traveller to enter the eGate
  - \( 1 \text{ sec.} \) for biometrics (face capture and comparison)
  - \( 5 - 6 \text{ sec.} \) for the traveller to leave the eGate
EasyPASS –
main lessons learned

- Verification thresholds recommended by vendors did not fit to the actual application scenario
  - Appropriate thresholds have to be calculated based on the real user group and the actual system setup
- Electronic document checks are reliable
  - < 0.1% of the travellers are rejected due to failures of the electronic document checks
    - Availability of CSCA certificates is a key issue
- Travellers
  - do not know if they carry an ePassport
  - are not familiar with the document reader
  - are happy with the fast and easy process
EasyPASS PLUS pilot project

- Pilot project of BSI and the German Federal Police
- Main goals
  - Support for the new German national ID card in EasyPASS
  - Development and implementation of the background infrastructure (EAC-PKI)
    - Terminal Control Center - TCC
- Timetable
  - Pilot operation since August 2011
  - Pilot phase until June 2012
### New German ID card

<table>
<thead>
<tr>
<th>Card body</th>
<th>Electronic functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to all electronic functions/data via Extended Access Control Version 2 (EAC 2)</td>
<td></td>
</tr>
<tr>
<td>• access certificates are mandatory (EAC-PKI)</td>
<td></td>
</tr>
<tr>
<td><strong>1. eMRTD function incl. biometrics</strong></td>
<td></td>
</tr>
<tr>
<td>• digital photograph and (upon request) two fingerprints</td>
<td></td>
</tr>
<tr>
<td>• only for entitled authorities, e.g. border control</td>
<td></td>
</tr>
<tr>
<td><strong>2. Electronic ID function</strong></td>
<td></td>
</tr>
<tr>
<td>• for E-Business- and E-Government</td>
<td></td>
</tr>
<tr>
<td>• access only to certain non-biometric data fields</td>
<td></td>
</tr>
<tr>
<td><strong>3. Qualified electronic signature</strong></td>
<td></td>
</tr>
<tr>
<td>• upon request</td>
<td></td>
</tr>
</tbody>
</table>

**Since Nov. 2010:**
credit-card-size ID 1 format
eMRTD PKI landscape

EasyPASS until Q3/2011

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Gaithersburg, March 6, 2012
**TCC – Terminal Control Center**

- TCC as central PKI component
  - Management of certificates and cryptographic keys
  - Authentication of connected terminals
  - Communication to DVCA and terminals via standardized interfaces
- ICAO-PKI (TCC for Passive Authentication)
  - Central storage of trusted CSCA certificates
  - Centralized checking of DS certificates
- EAC-PKI (TCC as core of the Inspection System)
  - Central storage of private keys in HSM
  - Easy certificate management incl. renewal
eMRTD PKI landscape incl. Terminal Control Center

EasyPASS since Q4/2011
EasyPASS – summing-up

- Combination of different checks to ensure a secure ABC process
  - Complete checking of eMRTD electronic security features at a high reliability level
  - Biometrics are of no use, if not authenticated!
- Fast and easy process (approx. 18 sec)
- Innovative software architecture (BioMiddle)
- Detailed monitoring of real life performance
- Since Q4/2011 support for the German ID card
  - Centralized checking of DS certificates and EAC via Terminal Control Center (TCC)
- Future challenges in the ABC / eGate area
  - Multiapplication (eMRTD, Visa, RTP)
  - Multibiometric (face, fingerprint, iris)
# ABC installations in Europe

<table>
<thead>
<tr>
<th>Country</th>
<th>System</th>
<th>Start of Operation</th>
<th>Locations</th>
<th>Token</th>
<th>Biometrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT</td>
<td>RAPID</td>
<td>2007</td>
<td>all int. airports</td>
<td>ePassport</td>
<td>face</td>
</tr>
<tr>
<td>UK</td>
<td>ePassport Gates</td>
<td>2008</td>
<td>all major int. airports</td>
<td>ePassport</td>
<td>face</td>
</tr>
<tr>
<td>FI</td>
<td>ABC lines</td>
<td>2008</td>
<td>Helsinki airport and Vaalimaa BCP</td>
<td>ePassport</td>
<td>face</td>
</tr>
<tr>
<td>FR</td>
<td>PARAFES</td>
<td>2009</td>
<td>2 airports (Paris CDG and Orly)</td>
<td>RTP / ePassport from 2012 on</td>
<td>fingerprint</td>
</tr>
<tr>
<td>DE</td>
<td>EasyPASS</td>
<td>2010</td>
<td>Frankfurt airport</td>
<td>ePassport / German ID card</td>
<td>face</td>
</tr>
<tr>
<td>ES</td>
<td>ABC system</td>
<td>2010</td>
<td>2 airports (Madrid and Barcelona)</td>
<td>ePassport / Spanish ID card</td>
<td>face / fingerprint</td>
</tr>
<tr>
<td>CZ</td>
<td>EasyGO</td>
<td>2011</td>
<td>Prague airport</td>
<td>ePassport</td>
<td>face</td>
</tr>
<tr>
<td>NL</td>
<td>No-Q</td>
<td>2012</td>
<td>Amsterdam airport</td>
<td>ePassport</td>
<td>face</td>
</tr>
</tbody>
</table>
Frontex ABC Guidelines

- ABC Working Group
  - NL, UK, FI, ES, PT, FR and DE
  - WG started in Feb. 2010
  - Version 1.1, March 2011
  - Biometrics: face verification only
- ABC Guidelines version 2.0 (coming in Q2/2012)
  - Two separate documents (technical / operational)
  - Biometrics: face and fingerprint

Thank you!

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