



Federal Office
for Information Security



E-gate case study: The German EasyPASS Project



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BSI – activities regarding eMRTDs

- IT security
 - Specification and standardization of security mechanisms (ICAO, ISO, EU, national level)
 - National root CAs (CSCA, CVCA, N-PKD)
- Biometrics
 - Evaluation of biometric technologies
 - Biometric framework BioMiddle
- Certification and approval
- Pilot projects
 - ePassports at the German border (e.g. EasyPASS)





Main steps towards EasyPASS

- Nov. 2005: Issuance of the 1st generation ePassport (face)
- Nov. 2007: Issuance of the 2nd generation ePassport (face and finger)
- Nov. 2007 – June 2009: Pilot project “Reading and Checking ePassports”
 - Read and checked ePassports from 62 countries
 - Setup of the background infrastructure to provide trusted CSCA certificates
 - Able to check the complete chain of trust from 40 countries
- Aug. 2009: Start of the pilot project **EasyPASS**
- Nov. 2010: Issuance of the new German ID card



EasyPASS – project overview

- Pilot project of BSI and the German Federal Police
- Semi-automated eGate scenario
 - Monitoring (and if necessary interaction) by border police officer
- 4 Self-service eGates, 1 monitoring station
- Open for citizens of EU/EEA/CH (18+ years old)
- Located at Frankfurt Airport
- Timetable
 - Start of operation was in August 2009
 - Pilot phase until March 2010
 - Since April 2010 regular operation





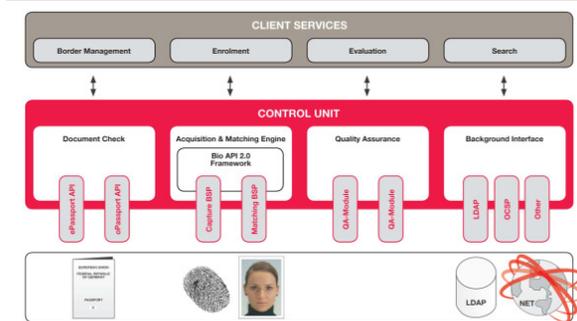
EasyPASS border control process using facial recognition





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
 - 3 different face comparison algorithms, each integrated as BioAPI Verification BSP





Operational figures – Characteristic of the user group (Oct. 2009 – Sept. 2010)

- Citizens of EU/EEA/CH (18+ years old) entering the Schengen area at Frankfurt Airport
- Origin: **89%** German nationals
11% foreign nationals from EU/EEA/CH
- Gender: **60%** male
40% female
- Age: **28%** 18 – 29 years old
46% 30 – 49 years old
23% 50 – 69 years old
3% 70 – 99 years old



Operational figures – No. of users (Oct. 2009 – Sept. 2010)

- **≈ 50.000** users passing through EasyPASS
- **≈ 43.000** users passing EasyPASS automatically
 - **86%** success rate
 - border crossing without manual interaction
 - **14%** rejection rate
 - additional manual inspection by border guard



Operational figures – Rejections by EasyPASS control process (Oct. 2009 – Sept. 2010)

Decomposition of the **14%** rejection rate

- **5,5%** rejected due to face verification failed
 - @ \approx **0,1% FAR** (False Accept Rate)
- **8,5%** rejected by the system due to other reasons
 - non compliant user behaviour
 - document check failed
 - hits from background database checks



Operational figures – Process time (Oct. 2009 – Sept. 2010)

- **≈ 18 sec.** average time period to pass the eGates
 - 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 sec.** for Reading and checking ePassport data (optical and electronic checks)
 - **5 - 6 sec.** for the traveller to enter the eGate
 - **1 sec.** for biometrics (face capture and comparison)
 - **5 - 6 sec.** for the traveller to leave the eGate



EasyPASS – 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
 - Only 10 out of 50.000 travellers (0,02%) have been rejected due to failures of the electronic document checks
- Travellers
 - do not know if they have an ePassport
 - are not familiar with the document reader
 - are happy with the fast and easy process



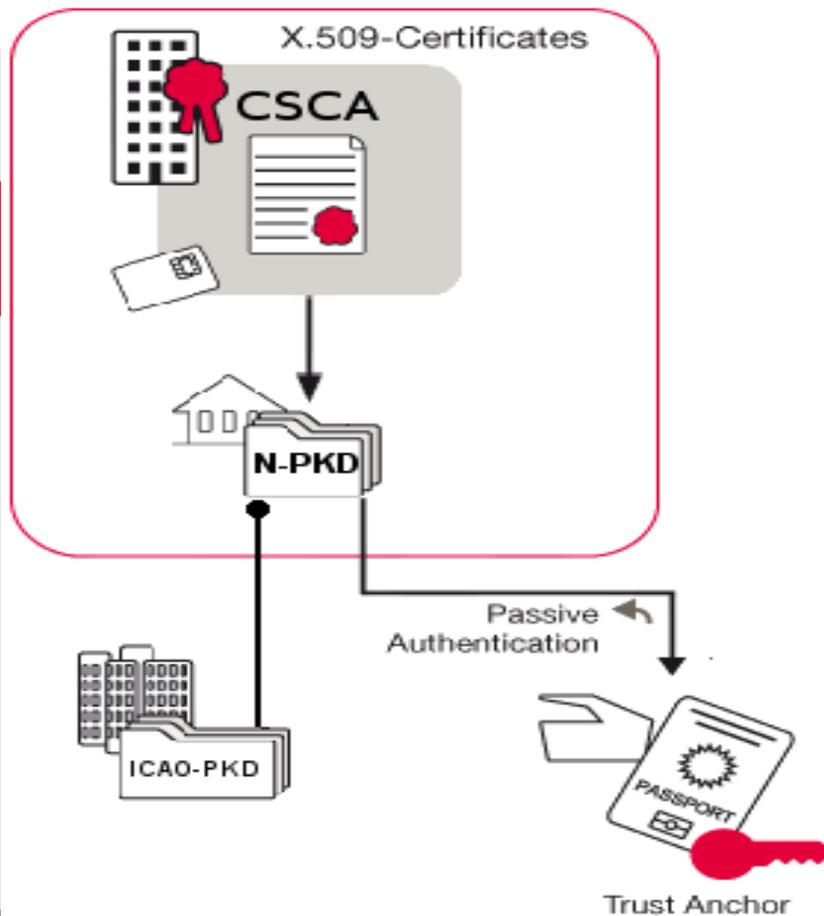
TCC – EAC extension for new German ID Card

- Extended Access Control (EAC) via Terminal Control Center (TCC) for
 - Read access to EAC protected data in ePassports
 - Support for the new German ID Card in EasyPASS and during regular border control
- Timetable
 - Pilot phase since May 2011
 - Regular operation estimated Q2/2012 including exchange of DV certificates within EU



eMRTD PKI landscape EasyPASS before TCC

ICAO-PKI

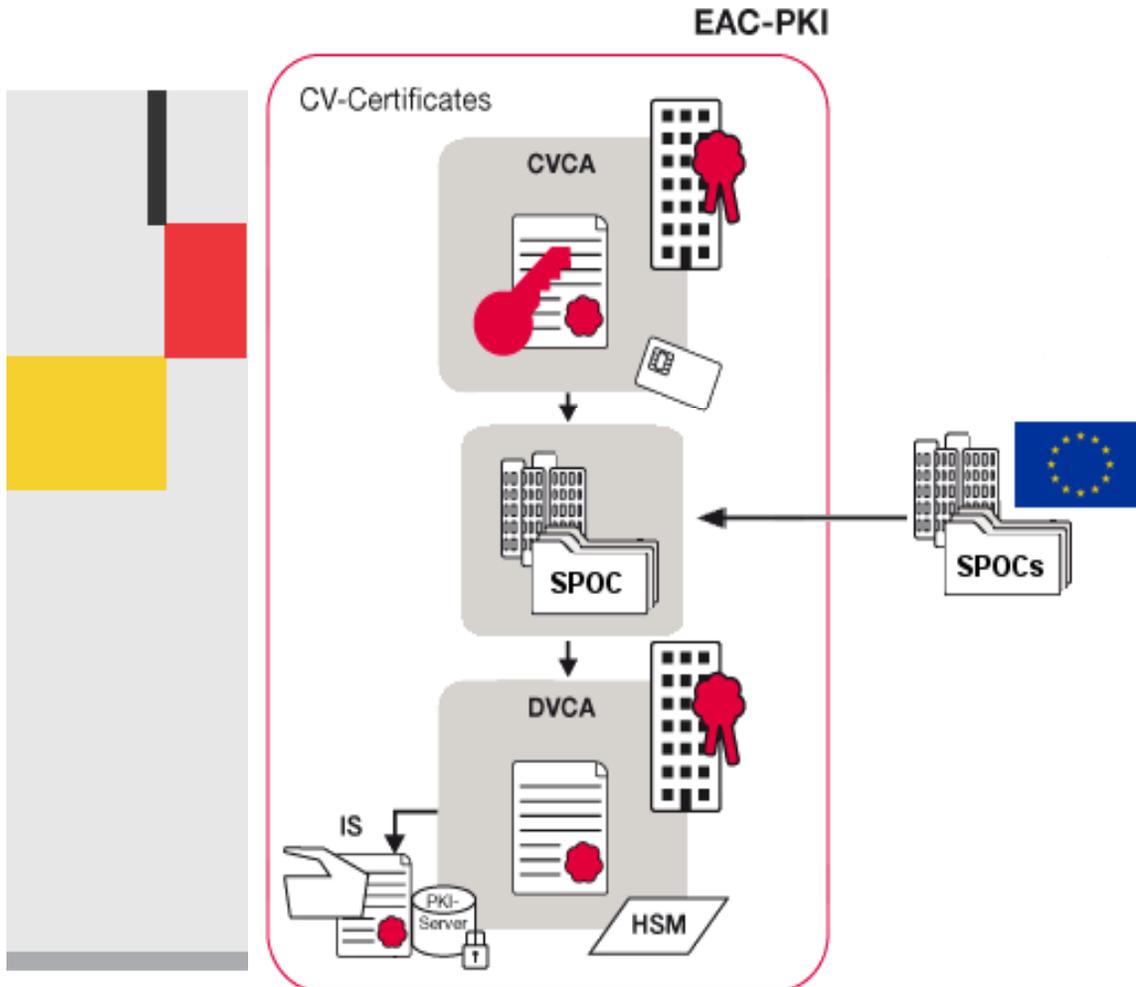


ICAO-PKI

- Central storage of trusted CSCA certificates



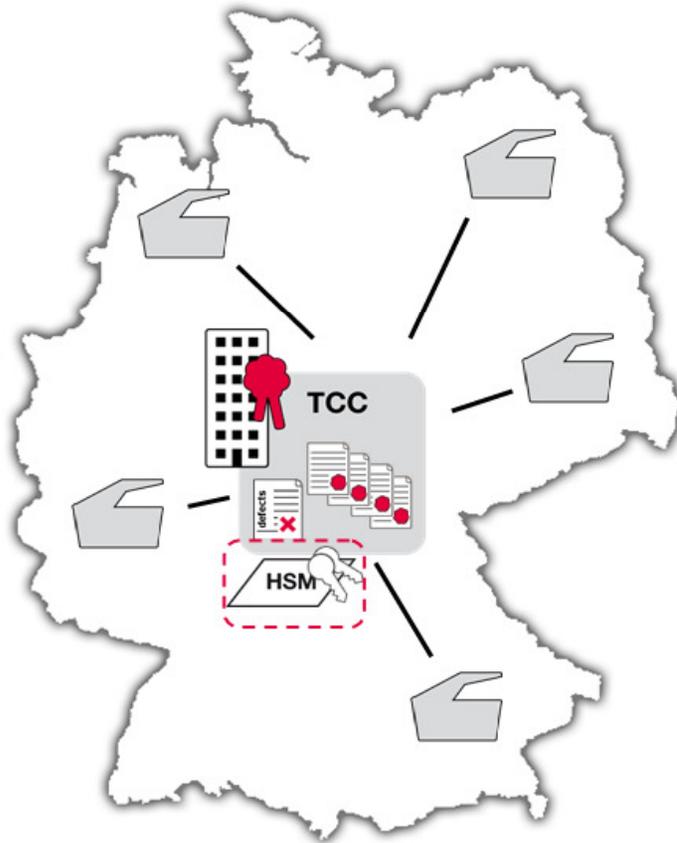
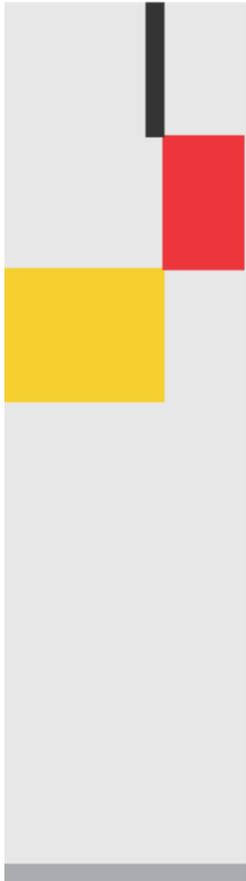
eMRTD PKI landscape Additional EAC-PKI



- EAC-PKI
- Central storage of private keys in HSM
- Easy certificate management incl. Renewal
- Certificate exchange within EU via SPOC



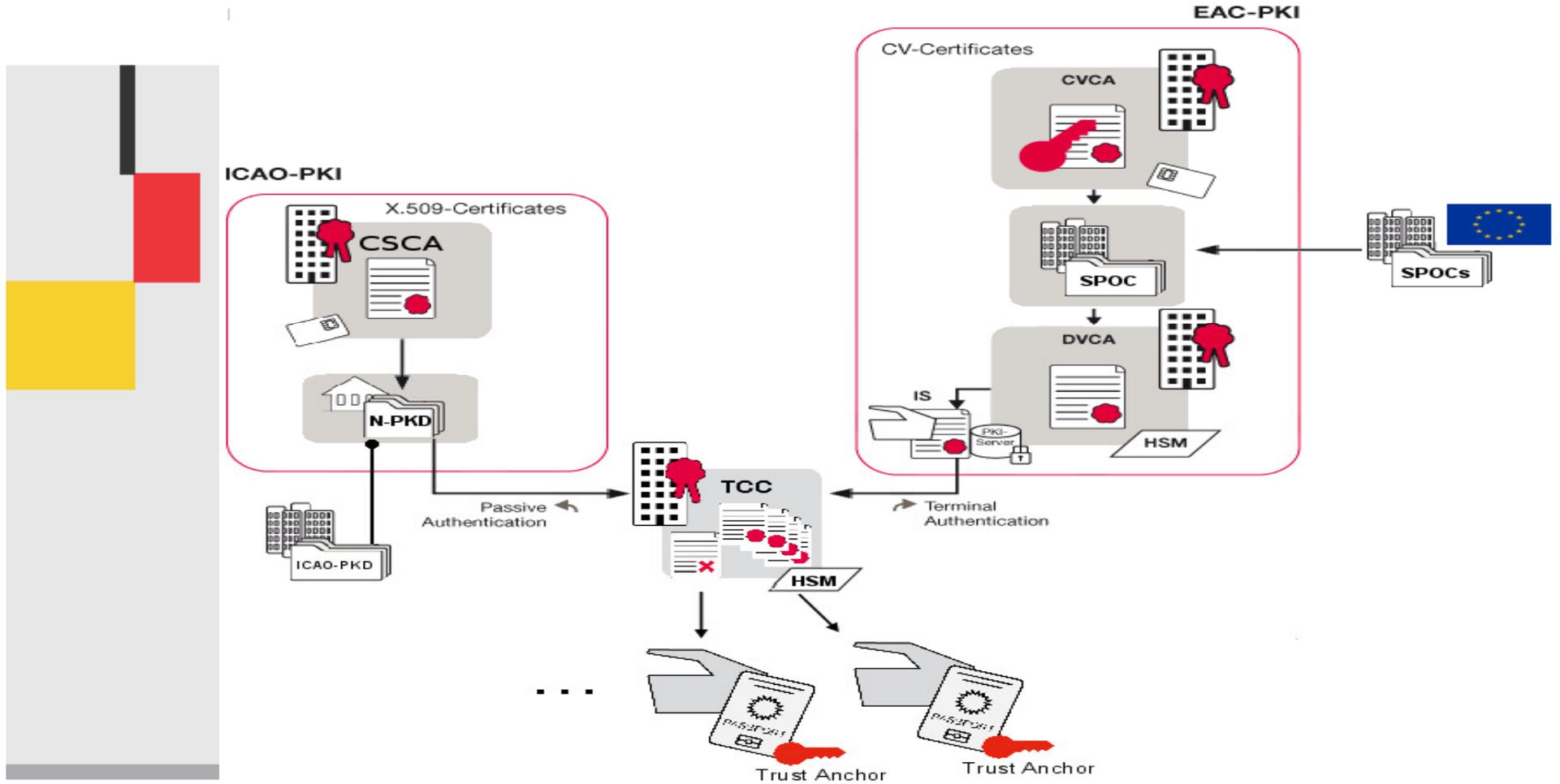
TCC – Terminal Control Center



- TCC as central PKI component
 - Centralized checking of DS certificates
 - Management of certificates and cryptographic keys
 - Authentication of connected terminals
 - Communication to DVCA and terminals via standardized interfaces



eMRTD PKI landscape incl. TCC EasyPASS in Q4/2011





EasyPASS – summing-up key issues

- Combination of different checks to ensure a secure ABC process
 - Validation of optical and electronic document security features
 - Biometric comparison on a high secure level
 - Online background checks
- Complete checking of the electronic features
 - **Biometrics are of no use, if not authenticated!**
- Fast and easy process (approx. 18 sec)
- Innovative software architecture (BioMiddle)
- Detailed evaluation of real life performance
- Support for the German ID card
 - Centralized checking of DS certificates and EAC via Terminal Control Center (TCC)





EasyPASS – project partners

- BSI
 - System design
 - Realisation of pilot project
- Federal Police
 - Specification of requirements
 - Operation of EasyPASS
- FRAPORT AG (owner and operator of Frankfurt Airport)
 - Provision of infrastructure



EasyPASS – technology providers

- secunet Security Networks AG
 - Software framework
 - System integration
 - Project evaluation
 - Implementation of TCC
- L-1 Identity Solutions AG
(in cooperation with
Magnetic Autocontrol GmbH)
 - eGate hardware
 - Intelligent camera system
 - Biometric verification algorithm
 - Biometric quality measurement
- Cognitec Systems GmbH
 - Biometric verification algorithm
 - Biometric quality measurement
- NEC Deutschland GmbH
 - Biometric verification algorithm
 - Biometric quality measurement
- Bundesdruckerei GmbH
 - Document readers
 - Document database



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Thank you!



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