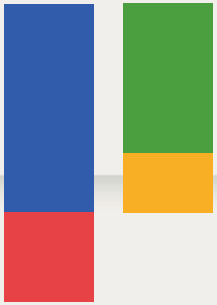

PrimeKey

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Assumption

- General knowledge about Common Criteria
  - Security Target, Protection Profiles, etc
- Sponsor, ***Developer***, Lab, Certification Body

A case study on certification and audit of open source security software

The Internet should be a safe place for sensitive information and communication

- EJBCA - Most downloaded PKI in the world, since 2001
- Certificate Authority Software
- >10 billion certificates issued
- Access to source code
- Open standards and Crypto agility
- Easy to get started
- **Common Criteria Certified**

EJBCA
PKI by PrimeKey

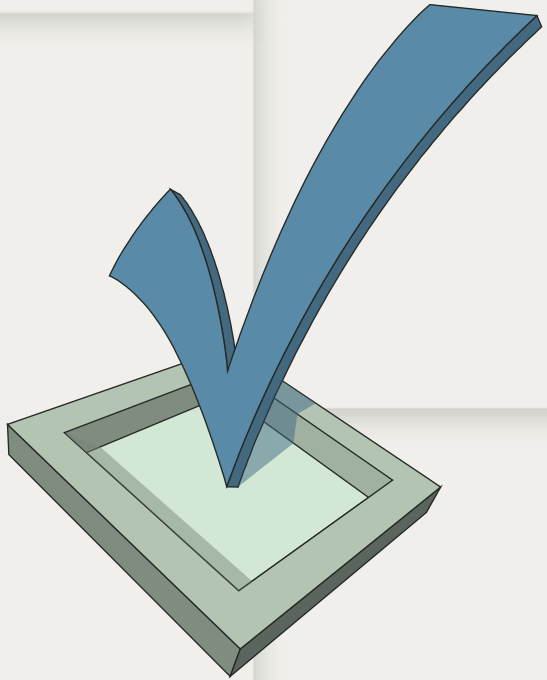
- **14 days free trail in AWS**
- **Community** (basics for free)

Relevant audits and certifications

- WebTrust/CAB Forum
- eIDAS/ETSI
- Common Criteria
- FIPS

It is used

- Public Tenders, World-wide
- Digital Signature Law
- Audits, eIDAS/ETSI & WebTrust
- Marketing & Brand



EJBCA Common Criteria Certification

- 2012
  - NIST, CIMC PP v1.0, security level 3
  - EAL 4+ (ALC_FLR.2)
  - CeSecore and EJBCA - Composite
- 2018
  - NIAP, Protection Profile for Certification Authorities, v2.1
  - No EAL
  - EJBCA

What works?

- Development process
- Protection Profile
- Audit Log
- Improving Quality
- Open is OK

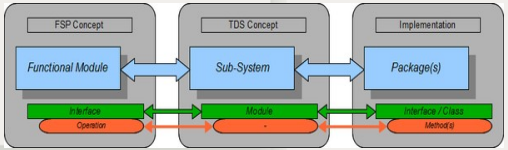
What is broken?

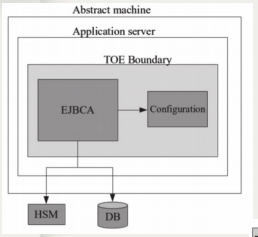
- Impact assessment
- Environment
- User understanding
- Waterfall
- Unused work
- Cost

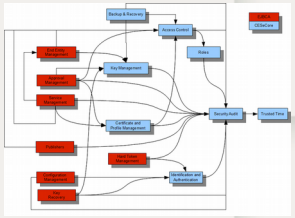
EAL CC Documentation

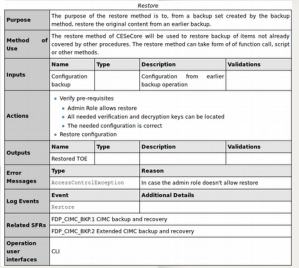
What is actually used?

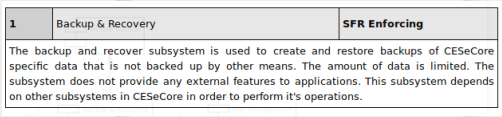
- **Security Target** (ST)
- Functional Specification (FSP)
- Design Specification (TDS)
- Implementation Representation (IMP)
- **Life Cycle Support** (ALC)
- Test Specification (ATE)
- Mapping SFR/Security Functions

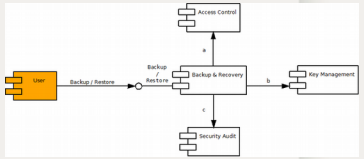


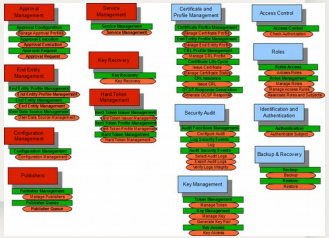












Common Criteria & EJBCA - Result

- **Open Source** works just fine
- Slightly **slower development** per issue
- **Better quality** per issue
- Well defined and tested **Audit Log**
- Improved **development process**
- Product **trustworthiness**
- Some re-usable **documentation**

EJBCA - Summary

- Open Source - LGPL
- Version 1.0, December 2001
- Modern code bas
- 6871 Jira issues May 5 2018
- ~400K lines of code (SLOC)

cPP CC Certification

Test focused vs Documentation focused

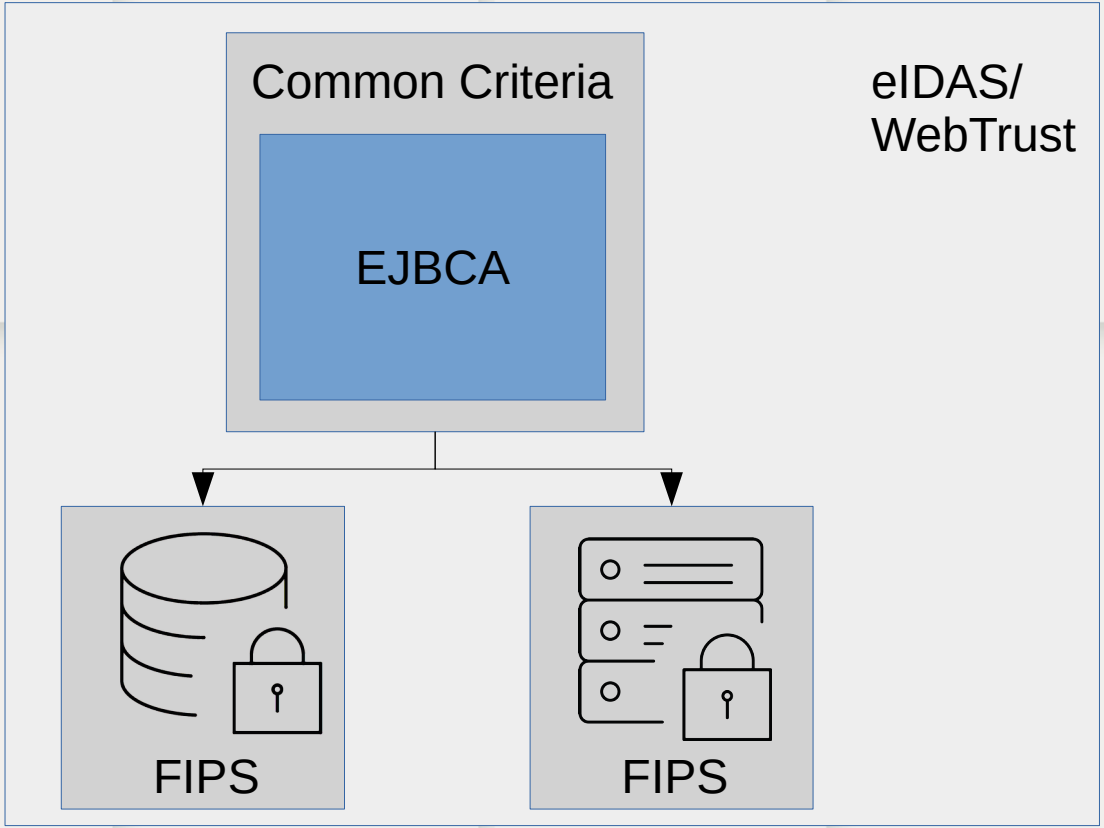
Lightweight documentation, focus on functions

- Security Target (ST)
- Test Specification (ATE)
- Mapping SFR/Security Functions

cPP CC Fears

- Development Process
- Code/Product Integrity
- Tought testing –
  ”*there are always gaps*”

Common Criteria and FIPS



BouncyCastle

Software *should* be CC, but Crypto/HSM *must* be FIPS.

- HSMs (asymmetric keys)
- Software (symmetric keys)

Using BouncyCastle gives both:

- Rapid development using non-FIPS
- Ability to switch in the FIPS provider

HSM FIPS mode issues

Recent issues related to FIPS and HSMs:

- Vendor_1 key generation. Get_MechanismInfo returns max size 4096, even when not in FIPS mode.
- Vendor_2:
  - Need to set *available mechanisms* when generating keys
  - Not possible to have key with sign+encrypt

Almost one year to fix and re-certify!

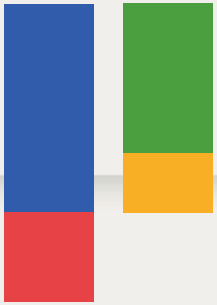
Conclusion

- In general good experience of CC
- Improvement with lightweight process
- Don’t miss out on development process and code integrity
- Remove Impact Assessment in current form
- Make it easier to understand for Users

Should do: Add a user FAQ on Common Criteria Portal

”Will the new certificate for EJBCA be based on an evaluation against TS 419261?”

”We have to use the certified version of EJBCA?”



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