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Fresh Eyes on OpenSSL: A Newcomer's Report

Stefan Eberle

20/10/2026

Purpose of the Talk

What it is

- Personal experience
- Opinion

of a **beginner**

What it is not

- Objective way to improve things
- Solution to a problem

Never implement crypto on your own. Use trusted libraries, because there are a hundred things you can get wrong while implementing it.

- paraphrase from a cryptography beginners lecture

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How I got into this



- *Studied math and computer science to become a teacher*
- *Attended my first cryptography lectures in Prague*
- *Internship at IBM D Research & Development*
- *Have been trying to understand OpenSSL ever since*

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How I started learning

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Framework:

- *9 months time*
- *No prior knowledge of big code bases*
- *A lot of math to understand next to OpenSSL*

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How I started learning

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How I developed

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Developing

- Documentation (= Code)
- Debugger
- Supported by AI

Testing

- Sanity checks
- Unit-Tests
- Openssl's `test`

*OpenSSL requires **thorough understanding** for*

- *Architecture*
- *Side-channel resistance*

Agentic development can't cover this!

Just experience through reading the codebase.

My approach:

Pen and paper proofs, great supervisor, debugging, flowcharts

Main pain points

Getting into the architecture with all its

- *providers*
- *hardware acceleration*
- *different platforms, partially C, various assemblers (Perl)*
- *dispatches, fallbacks, wrapper functions*

Podcast with Pythons Alex Gaynor and Paul Kehrer says that OpenSSL is too overcomplicated

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Sweet spots

- *Good documentation for users*
- *Very powerful*
- *Broad and extensible*

- ***Has a well organised conference***

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Quo vadis OpenSSL?

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„Review, not authorship, is the scarce resource in this project

- openssl/CONTRIBUTING.md

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Getting newcomers on board?

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Con

- Flood of AI-generated findings and pull requests
- Security first means gatekeeping

Pro

- Need for a new generation of developers and reviewers
- Fresh knowledge from recent research
- New tooling ideas

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What would be helpful for newcomer?

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Resources (developer tutorials, videos, workshops) for newcomers:

- *Overview of architecture*
- *Guide for documentation*
- *Suggestion of tools (OpenSSL speed...)*

→ *Better for **humans** not just for bots*

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Thanks for your time

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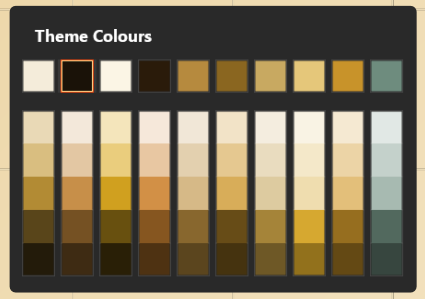
Presentation Guidelines

- **Mind the gaps**
  - Make sure there is a gap between your added content and the frame's borders.
- **Fonts**
  - Titles: Newsreader **Bold** and *Italic*
    - *Max Size 80, Min Size 36*
  - Body text: Inter Tight
    - Max Size 24, Min Size 12
  - Footer: JetBrains Mono
- **Logo**
  - Nothing should be placed inside the safe zones of the logo.
- **Colours**
  - Avoid using colours that are not predefined in the **Theme Colours**.



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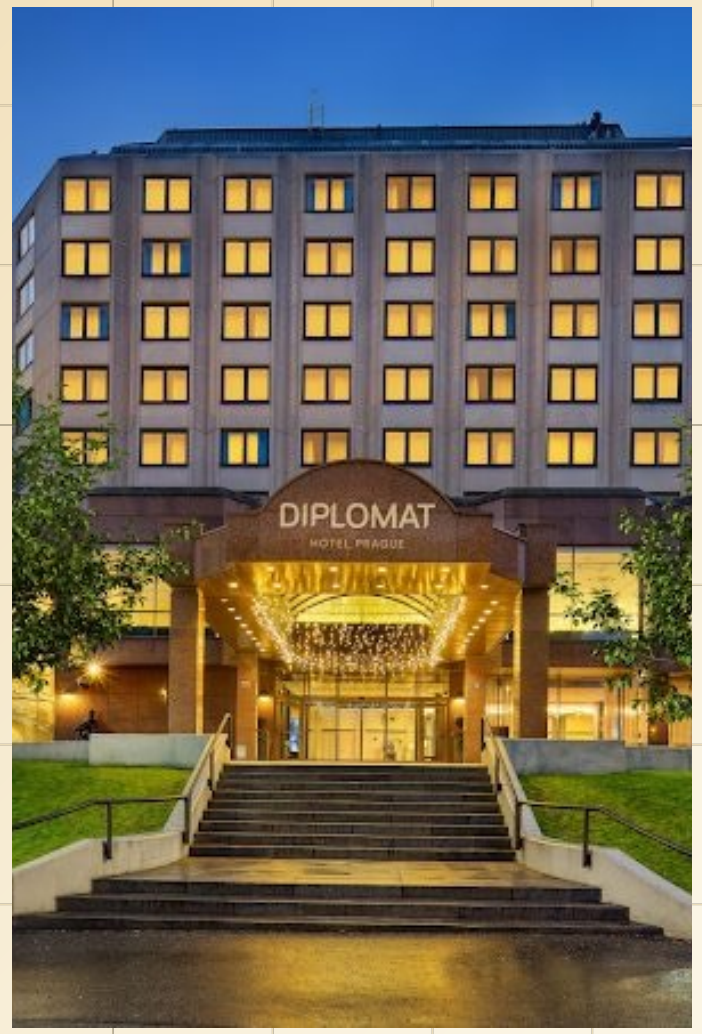

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- Lorem Ipsum, 1998



The Grand Bohemia

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