Uni App Security Notes

Felix Pojtinger

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Introduction

Contributing

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These study materials are heavily based on professor Heuzeroth's "Anwendungssicherheit" lecture at HdM Stuttgart.

Found an error or have a suggestion? Please open an issue on GitHub (github.com/pojntfx/uni-appsecurity-notes):

Figure 1: QR code to source repository

If you like the study materials, a GitHub star is always appreciated :)

License

License

Figure 2: AGPL-3.0 license badge

Organization

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- 60 Minutes of test at the end
- Will have practical examples
- Threat detection plays a fundamental role in tests

Overview

Elements of a Secure Development Process

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Primary purpose: Analysis of the data flow; data is both protected by the GDPR and represents value of the corportation

- **Requirements**
  - Security-Requirements
  - Anti-Requirements
  - Abuse cases
  - Protection poker
  - $\rightarrow$ **Security analysis/architecture analysis**
- **Draft**
  - AuthN/AuthZ
  - Drafting concepts
  - **Risk modelling**
- **Implementation**
  - Secure implementation guidelines
  - **Code review, dynamic analysis**
- **Tests**
  - Security testing plans
  - Security testing cases
  - **Ethical hacking, pentesting, dynamic analysis**

Support Hierarchy

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- **Level 1**: Direct support with customers; call center, non-technical
- **Level 2**: People who know about typical problems with the software
- **Level 3**: Developers of the software

Basics

What is Secure Software?

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- Software which is protected against intentional attacks
- Every participant in the software development process should be interested in this objective
- Software must be hardened against all known attacks (and future, unknown attacks)

What is Security?

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- $Risk = \frac{Cost\ of\ breach}{Probability\ of\ breach}$
- A system is protected against threats compromising valuable data using measures which lead to a reduced, accepted risk.
- Accepted risk is defined by context of use (i.e. nuclear power: very low accepted risks)
- **Safety**: Protection of the environment from the functional effects a system
- **Security**: Protection of the system from threats from the environment
- Concrete definitions: uni-itsec-notes#security-objectives; most importantly ("CIA objectives"):
  - Confidentiality
  - Integrity
  - Availability
- If there are contractions between the security objectives (anonymity vs. accountability): The context defines which objectives dominate over others

CISSP Domains/Certificates

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- **Security Engineering**: Engineering and Management of Security
- **Security Assessment and Testing**: Designing, Performing and Analyzing Security Testing
- **Security Operations**: Foundational Concepts, Investigations, Incident Management and Disaster Recovery
- **Software Development Security**: Understanding, Applying and Enforcing Software Security
- $\rightarrow$ This course strives for 80% of TPSSE compliance

Why Security?

Why Security?

- Security is context dependent: On `localhost` and unprotected UNIX socket isn't an issue, but forward it with `socat` and it becomes a massive security vulnerability!
- With every change every test needs to be run again (regression testing)
- Typically ~30 errors in every 1000 lines of code
- Growing application complexity
- Devices are more and more connected which reduces the need for physical access
- Extensible architectures