Lab: Usable Security and Privacy
Conducting Studies with Experts

Supervisors:
Alena Naiakshina
Anastasia Danilova
About us …

• Our research field:

Usable Security and Privacy for Developers & Administrators
Lab Topic 1: Documentation Usability

- Good documentation might lead to more secure code
- How can API documentation be evaluated? Find criteria to evaluate documentations

- Design a guideline & conduct a developer study to investigate documentation usability

- Possibly as group project
Literature

• You Get Where You're Looking for: The Impact of Information Sources on Code Security
  Yasemin Acar ; Michael Backes ; Sascha Fahl ; Doowon Kim ; Michelle L. Mazurek ; Christian Stransky

• Developers Need Support, Too: A Survey of Security Advice for Software Developers
  Yasemin Acar ; Christian Stransky ; Dominik Wermke ; L. Mazurek ; Sascha Fahl
Lab Topic 2: Developer Mental Model Warning

- Design and explore the mental model of software developers
- How would software developer want to be warned, drawing
- Design guideline and conduct software developer studies
- Evaluate and summarize mental models
Literature

- Cristian Bravo-Lillo, Lorrie Faith Cranor, Julie Downs, Saranga Komanduri: Bridging the Gap in Computer Security Warnings A Mental Model Approach
Lab Topic 3: Administrator Security Warnings

• Examine prior research on administrator security warnings

• Which warning types could be possible

• Design study and find out about security warning approaches and types

• evaluate interviews
Lab Topic 4: Security Warning on Committing

- Implement a warning which is displayed on committing
- Choose an IDE which you want to use e.g. Eclipse, Netbeans
- Add warnings on committing in the IDE
Lab Topic 5: Usability Evaluation IDS

- IDS = Intrusion Detection System
- Evaluate usability of the most prominent IDS with developer studies
- How easy is the set-up?
- How easy is the usage?
Lab Topic 6: Security advice

• What do developers use to program:
  
documentation, stackoverflow, tutorials etc

• How much security advice do they find on the resources

• Which security advice do they prefer: Security warnings, documentation, education etc.?
Lab Topic 7: Security motivation administrators

• What do administrators see as motivation factors and deterrents for security
• Interview + Survey

Similar to “Think secure from the beginning”: A Survey with Software Developers from Assal et al.
Literature

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• Developers Need Support, Too: A Survey of Security Advice for Software Developers
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Own ideas

- Any **own ideas** for a project in Usable Security and Privacy for developers/admins?

  GREAT!

  - We’d love to work with you on that!
Apply

• Please send your exposé to:
  
danilova@cs.uni-bonn.de

**Deadline for exposé: 9 April**

• On the **16 April** you will be informed whether you were chosen/not chosen for your favourite lab topic
• **Register deadline for the lab in BASIS:** 30.04.2019
Conducting Studies with Experts Pt.2

Supervisors:
Christian Tiefenau
Maximilian Häring
Lab Topic 1 + 2: Alexa Hut

• Mute Amazon Echo with Token

• Work 1: Develop and evaluate concept of possible tokens
  • How to build trust through physical devices?
  • How do they look like?

• Work 2: Build prototypes and conduct a study
Lab Topic 3: Experience sampling for experts

- Get feedback in the field

- Experience sampling -> welche events möchte ich mitbekommen
  - Identify desired events (ssh connection, security related tasks, logins,...)
  - Elaborate how to detect those events in the experts' context

- Build a prototype and run a pilot study
Lab Topic 4: Data analysis on real world data

tiefenau@cs.uni-bonn.de

• Collection of real world configuration evaluation results of TLS-servers
  • Qualys + HTBridge

• Analyze the data
  • Find configuration patterns (Enable TLS --> Enable HSTS -->...)
  • Common flaws (Keysize too small, Usage of old (broken) Ciphers, ...)
  • ....
Lab Topic 5: Version Watcher haering@cs.uni-bonn.de

• Implementation of an web application that gathers and displays version information
  • Software, version, provider of the update (apt-get etc.)

• Gathering data over time and analyze it.
  • How long does each provider need?
  • Should you use XY if you want to update in time?
Lab Topic 6: IoT device and version detection

- Implement a network scanner that displays devices + version numbers
  - e.g. through fingerprinting of versions

- Conduct a small study
  - show the feasibility
  - record the reaction of the participants
  - gather the status quo of the participants
Lab Topic 7: Security awareness and sources to conduct of administrators

• What sources to administrators conduct and how aware are they?

• Study design (interview, survey)
Apply

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  tiefenau@cs.uni-bonn.de
  haering@cs.uni-bonn.de

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Fuzzing GUI

Supervisor: Klaus Tulbure
About me …

• My research field:

Usable Program Analysis
Fuzzer

- "intelligent brute-force" analysis of programs
Lab Topic 1: Fuzzing GUI

- design a GUI that assists the user on the fuzzing work-flow
- the GUI should provide a live representation of the fuzzing process and controls for the fuzzer
- implement it as a plug-in for a common IDE/editor, e.g.
  - Microsoft Visual Studio Code
  - JetBrains Clion
- Recommended skills:
  - C/C++, CMake
Lab Topic 1: Fuzzing GUI

Literature


Lab Topic 2: Back-end for Fuzzing GUI

- provide a bridge between the fuzzer and the GUI front-end
- pre-process the program information for the front-end
- observe and control the fuzzer
- state-of-the-art fuzzers: libfuzzer and American Fuzzy Lop
Lab Topic 2: Back-end for Fuzzing GUI

Literature


• LLVM Project. "libFuzzer" https://llvm.org/docs/LibFuzzer.html
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• Please send your exposé to:
  tulburek@cs.uni-bonn.de

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Studies and Fuzzing

Supervisors:
Mischa Meier
Stephan Plöger
About us …

• Our research field:

Usable Program Analysis, Fuzzing and CTF
Lab Topic 1: Study - Usability Fuzzers

- How usable are common fuzzers
- If you don't know what fuzzers are not super easy but ok-ish
- Good knowledge of studies
Lab Topic 2: Study - Fixing Bugs

• About Static and Dynamic Analysis

• How good is the output of static and dynamic analysis for fixing bugs

• High-Level-knowledge of fuzzing and studies

• Hard task but rewarding
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  meierm@cs.uni-bonn.de
  
ploegers@cs.uni-bonn.de

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Lab: Security in Distributed Systems
Studies and Fuzzing

Supervisors:
Mischa Meier
Stephan Plöger
About us …

• Our research field:

Usable Program Analysis, Fuzzing and CTF
Lab Topic 3: Study-Platform Frontend

- Backend exists and is cool
- new Frontend and maybe a little bit Backend
- JavaScript or the like
- Experience in Frontend-development
Lab Topic 4: Task defend CTF

• If you don't know what CTF is this Lab is not for you
• Create tasks for a defend CTF
• More information in a one-to-one conversation
Lab Topic 5: Extend the CTF infrastructure

• If you don’t know what CTF is this Lab is not for you

• currently: one machine per team
• vision: a network per team (simulation of an infrastructure)

• Task: Extend and show the feasibility with an easy CTF setup
Lab Topic 6: Function Argument Detection

- in Binaries ((no source-code))
- Monotone Framework
- We have an algorithm implemented and need adjustments
- More information in a one-to-one conversation
- Please don't do it, it is very hard (but cool)
Apply

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  ploegers@cs.uni-bonn.de

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Intro Research Topic
Topic
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