Studienarbeit: Reverse Engineering Lab

Studiengang Informatik
OST - Ostschweizer Fachhochschule
Campus Rapperswil Jon

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School of Computer Science
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Abstract

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4.1 Project Plan

4.1.1 Project Overview

The goal of this project is to create and organize a lab, which shows and explains future students of the Ostschweizer Fachhochschule (OST) how reverse engineering is performed and which tactics are used to get information out of a program. To accomplish this task, the lab will have several exercises organized in the different domains. These exercises will be accessible through the Hacking-Lab hosted on the OST server.

Hand-In

The finished Report will be handed in according to the rules set by the "Studiengangsleitung Informatik" and the supervisor:

- The PDF version will be sent to the advisor and to the OST archive.
- The printed version will be handed in to the supervisor for reading and grading.

4.1.2 Management

Time Management

The project started on the first week of the semester (KW 38) and ends in week 51 giving us around 14 weeks to be done with the Hand-In.
Since the module has a total ECTS of 8 each of the students has to work around 240h during the semester which can be seen in table 4.1 together with the total planned time investment. This means, that per week each student should work around 17.1 hours.

Name	ECTS	Time spent per Week [h]	Total Time spent [h]
Gianluca Nenz	8	17.1	240
Ronny Mueller	8	17.1	240
Thomas Kleb	8	17.1	240
Total	32	52.3	720

Table 4.1: Time Investments

Planning and Project Management

In the past modules Software Engineering Practices 1 and 2 (SEP 1 + 2) we were introduced to different ways to plan and organize a project. The main tools we learned, RUP (Rational Unified Process) and Scrum, are mainly used in software development but can be adapted to other projects aswell. They both use different aspects of time management and organisation which is why we intend to apply them to our project.
We use RUP to section our project into Inception, where we get a first insight into the project and how we want it to resolve; Elaboration, to plan our project, define the workload-distribution and setting up first concepts of the finished labs; The construction phase is mainly used to plan, build and test the labs while the last phase, the transition phase, is used as buffer and to finish our product.
To make sure everything works as planned we use Scrum with its Sprints to setup Milestones and Tasks which help structurize the development.

4.1.3 Organisation

Participants

The "Studienarbeit"-Team consists of three students: Gianluca Nenz, Ronny Mueller and Thomas Kleb. Work on the project and documentation will be evenly distributed between these three participants. Bigger decisions are made as a team in either the meetings with or without the advisor (the advisor will be notified on any change made).

Advisor

The teams advisor for the "Studienarbeit" is Ivan Buetler who is teaching cyber security modules at the OST.

Division of Labor

The project has multiple facets that need to be taken care of. This is why the team has decided to distributed the work load between the three. This doesn't mean that the work is done by only the chosen student but rather that he is the one responsible that it works as planned.

Gianluca Nenz	Ronny Mueller	Thomas Kleb
Meetings	Work 1	Protocols
Work 2	Work 2	Documentation
Work 3	Work 3	Work 3
Work 4	Work 4	Work 4

Table 4.2: Work Distribution per Student

4.1.4 Planning and Milestones

Phases and Iterations

The project is comprised of the four steps explained in **??**. Each of those phases has multiple iterations which create the different sprints for the project. The meetings with the advisor will be on thursdays while the team meetings will be held tuesdays. Each iteration / sprint will be of a seven day length.

We started the "Studienarbeit" before we began with the regular school. In the week before we each made research and plans about the comming project. After having a talk with the advisor it was decided to first find out the level of knowledge each student has to make it easier for the advisor to plan.

Inception			
Iteration	Start	End	Description
0	12.09.2022	18.09.2022	Collection of Ideas and planning first meeting
1	19.09.2022	25.09.2022	First meeting and handout of exercises to assess the knowledge of the students
2	26.09.2022	02.10.2022	Working on the exercises and receiving solutions for harder ones

Table 4.3: RUP: Inception Phase Planning

The elaboration phase is used to plan and assess the possible risks in this project. This consists of a documentation structure, the project plan and the risk management to make sure the construction phase has no major hickups.

Elaboration			
Iteration	Start	End	Description
3	03.10.2022	09.10.2022	First big meeting with advisor; Creating project plan and risk analysis.
4	10.10.2022	13.10.2022	Project Plan and Documentation is set; Problem Domains and Learning-concepts are defined
5	14.10.2022	25.10.2022	Lab Conepts are defined

Table 4.4: RUP: Elaboration Phase Planning

The construction phase is where the labs are primarily built.

Construction			
Iteration	Start	End	Description
6	25.10.2022	01.11.2022	—-
7	01.11.2022	08.11.2022	—-
8	08.11.2022	15.11.2022	—-
9	15.11.2022	22.11.2022	—-
10	22.11.2022	29.11.2022	—-
11	29.11.2022	06.12.2022	—-

Table 4.5: RUP: Construction Phase Planning

To make sure enough time is planned a buffer week was added to the transition phase. This phase is also mainly used to finish up the documentation and implement the different labs to Hacking Lab. The last week is used to clean up and hand in the documentation and abstract to both the OST and the advisor.

Transition			
Iteration	Start	End	Description
12	06.12.2022	13.12.2022	Buffer
13	13.12.2022	20.12.2022	—-
14	20.12.2022	23.12.2022	—-

Table 4.6: RUP: Transition Phase Planning

Milestones

To guarantee the success of the project milestones were defined with a deadline.

Milestones	Deadline	Description
M1 - Solving RE Exercises	05.10.2022	The Team solves the given exercises to find the level of RE knowledge.
M2 - Defining Problem Domains and Learnconcepts	13.10.2022	Problem Domains are defined, first Lernconcepts are planned
M3 - Lab Concepts	25.10.2022	Lab Concepts are defined to start working on the construction.
M4 - Setup Labs	06.12.2022	Labs are setup and tested.
M5 - Hand-In	23.12.2022	Document is handed in to the advisor and OST

Time Tracking

For time tracking the team has decided on using GitLabs integrated time tracking.

Issue Tracking

The issue tracking is done on GitLabs own interface to have as few difficulties as possible. To have an easier overview of the different issues the team has created tags to differentiate between the issues and their assigned student.

Meetings

The team has meetings each tuesday to elaborate problems and check up on the progress. This meetings are also used to distributed the work load and the different parts of the sprint.
On Thursdays the team meets the advisor Ivan Buetler to inform him on the progress done and the problems that came up. These meetings have different time schedules to fit everyones calender.
Each meeting will be documented and uploaded to the GIT repository. After each meeting the participants should know what to do and how to contact each other if any problems arise.

CI/CD

Testing

Projectmanagment

The whole project will use a GitLab repository. To make sure no confusion happens a multirepo principle is used where one repository is for the documentation and protocols only and other are for code, information gathered, etc. Each student works on a branch and before pushing to the main branch has another student look into the code / text written.

4.2 Risk Analysis

4.3 Project Monitoring

Overview

Milestones

Time Tracking

4.4 Personal Rapports

Gianluca Nenz

Ronny Mueller

Thomas Kleb

Chapter 5

Meetings

5.1 06-10-22

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5.2 Glossary

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5.5 Illustration Directory

Appendix

5.6 Eigenständigkeitserklärung

Eigenständigkeitserklärung

Erklärung
Wir erklären hiermit,

- dass wir die vorliegende Arbeit selbst und ohne fremde Hilfe durchgeführt haben, ausser derjenigen, welche explizit in der Aufgabenstellung erwähnt ist oder mit de Betreuer schriftlich vereinbart wurde,
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Gianluca Nenz	Date
Ronny Mueller	Date
Thomas Kleb	Date

5.7 Nutzungsrechte

5.8 Danksagung