CS4240/6240 Spring 2024 Course Project Description

Your project is worth 100 points. *This is a small security related project, not Master's thesis size project. It has to be practical and interesting. You will upload it to the github and share link with the class.*

The goal of the project is to further develop understanding of the course material, which is centered around system administration and security. Therefore, your project should explore topics related to security. Projects are done in groups of up to 4 students. If a group has a graduate student, then that graduate student will need to provide an extension to the project – develop an additional functionality of some kind. This extension will be graded as a graduate student requirement and will not affect the grade of the undergraduate teammates.

Students will need to conduct research into similar projects and motivate why their project is important. This project should become a well-documented open source project that others in the Linux community can use. It is recommended that the project is housed on github, but it is not required. Project can be based on other open source projects. Your tool can be a command-line tool, or use a visual interface developed in a visual language of your choice. The general topic areas are listed below:

- Develop an open source tool that detects intrusion to the system, suspends the attack, and secures the system.
- Develop a visual or command-line tool to penetrate a system (this should be geared towards the latest Linux distributions).
- Develop a tool to collect and process data from IoT.

You are welcome to propose topics of your choice, BUT all topics are subject to approval!

Project Proposal Due: 3/16 before 11:59 pm (0 points):

Write a 1-page (or less) *informal* project proposal in .pdf format. Clearly identify the objectives of your project. Describe in detail what you are doing and why you are doing it. Show related research/projects. Explain why your project is important. List members of your group (no more than 4), and describe the system/s that you are using for your project. Your project should either use a VM, or any Linux installation of your choice, *not* Windows and *not* Mac. Submit to canvas to get your project approval and feedback.

Presentation in class on 4/11, 4/16 and 4/18 (30 points):

You will present your project in class in person. Your presentation will be no longer than 10 minutes, and no shorter than 8 minutes. Provide motivation why you have done what you have done, and why it is important/cool/fun/etc. You would need 3-4 slides (not more than that) just to show the highlights of your project.

Final paper submission Due: 4/18 before 11:59 pm via canvas (70 points):

You will submit a 2 – 2.5 page ACM-style paper that describes the details of your project. The

paper should be written in ACM format. Please keep in mind that this format is a lot tighter than the regular double-spaced APA or MLA format. The paper should be detailed enough so that those who are not familiar with your work could understand all the details of it. The 2-2.5 page content has to be accompanied by (a reasonable number of) data tables and/or figures of a reasonable size. You need to show exactly how the project works and how someone who is interested in it can install and run it. Your paper should have several components (*may vary depending on what applies to your work*):

- *Abstract:* please remember that an abstract has a very simple goal – to let potential readers know what the paper is about. Readers often look through the abstracts to determine if a paper is within their research interest. You are not motivating the subject matter here or explaining why you have chosen the particular topic.

- *Introduction*: introduce your topic, summarize what you did, why you did it and your results.

- *Background*: include the background that is appropriate for your project. Include material from your research, but only the information that is directly relevant to your project. You should find several external sources of information that provide you guidance for your work.

- *Motivations and objectives*: explain what you are trying to do and why you are doing it. Position your project with respect to the related work you identified in the background section.

- *Methodology/Design*: explain the methods and/or system design that you used to achieve your objectives. You should have at least one figure that illustrates the methodology or design.

- *Analysis/results*: This documents the validation, demonstration, analysis of your project.

- *Conclusions and future work*: Summarize what you achieved and draw conclusions on your work. Identify weaknesses in what you have done. Describe any future work that you think needs to be performed.