DATX11-23-21

A gamified platform to learn security

Background:
Learning about IT security is always hard. The way in which this learning was traditionally acquired in the hacking community was purely pragmatical with the learner writing their own vulnerability exploit code.

Nowadays, this learning can be done legally and in a gamified way to improve the learning. Two different but related approaches exist to do so. On one hand, competitions exist where participants can test their knowledge by solving challenges. Unfortunately, these usually run for a short amount of time and may not have challenges adequate to the level of the learner. On the other hand, learning platforms like Over The Wire or Hack the Box exist but they usually lack a clear set of learning objectives and instead just propose challenges of growing complexity.

Project description:
The main objective of this project is creating a platform to help other students acquire the knowledge imparted on the security courses at Chalmers.

In the first step, students will research how to create meaningful challenges that help those solving them acquire new skills related to security. Examples of such challenges would be those one can find on a CTF competition or on security learning platforms. These challenges usually are limited by different practical reasons (for example limiting exploitation to the specific technique being taught, the need to ensure a flag is extracted after successful exploitation , or the ability to host the vulnerable code). Students must, therefore, also learn about these limitations and how they are addressed by challenge writers. Students will also research existing platforms (like CTFd) they can leverage as the base on which to create their own.

On the second step, students will analyze the learning objectives of the IT Security courses offered by Chalmers and propose challenges that can help students reach such objectives.

On the third step, students will put their knowledge into practice by creating their own platform that can be used by the students and actually implementing some of the challenges they proposed. If the project is successful, the platform will be used for future iterations of the courses.

Finally students are expected to write a report summarizing their learning from the project.

Suggested reading (and watching) material:
https://ctftime.org/ctf-wtf/
https://overthewire.org/wargames/
https://www.hackthebox.com/

Target group: D, DV and IT

Special prerequisites: Prior knowledge on programming and computer security basics (EDA263 can be taken along this project) are strongly recommended.

Proposal author: Francisco Blas Izquierdo Riera