Introduction to Network Security

Mohammad Noureddine

Department of Computer Science and Software Engineering
Rose-Hulman Institute of Technology

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Today's Goals

- Nag about how Linux crashes.
- Introductions and ice breakers.
- Course organization.
- Labs.
- Project.
- Maybe final exam?
- Introduction to networking.

Damn you Debian!

- Just last night, vm hosting class webpage decided to crash!
- Can't even boot anymore.
- Bad disk corruption.
- No idea what happened.
- No course website.
- Moving to a new server.
- Lab virtual machines should be ready today!

About me

- Please call me *Mohammad*.

Education

Education

- BE in Computer Engineering from AUB.
- ME in Electrical Engineering from AUB.
- PhD in Computer Science from UIUC.

Research

- Networking and network security.
- Programmable networks.
- General systems security.

Interests and Hobbies

- Basketball (a bit).
- Reading:
  - Philosophy.
  - Politics (mostly political history).
  - Mythology.
  - Agatha Christie.
- **Coffee**.

About you!

- (Preferred) name.
- Major.
- Why are you taking this class?
- Ask me a question.
  - I get to ask you the same question!

Skillset

To really make it in this class, you will need to train the following muscles:

- `python` and `C` programming.
- A lot of `Unix` terminal management.
  - This is crucial to make your life easier.
- A good pair of eyes.
  - A lot of staring at the screen.
  - Working with weird config files.
- Writing.
- Presentation.

Course Format

- **Who has class at 3:00 pm?**
  - Would you like to meet twice a week instead of 4 times?
- Mostly no lectures from me.
  - Occasional demo and introduction here and there.
  - Don't have to listen to my voice for 50 minutes.
- Class time is reserved for doing labs, asking questions throughout.
  - Makes more sense to meet twice a week for a longer time period.
- Labs will take some time and you will need to submit lab sheet.

Peer Teaching

- Once a week, one group of students will present about last week's topic.
- Goal is to teach us about the main concepts of the lab.
- Use examples and generate additional data to illustrate what you are teaching.
- Feynman technique (ish).
  - Corollary, you have to master at least one of the topics we talk about.

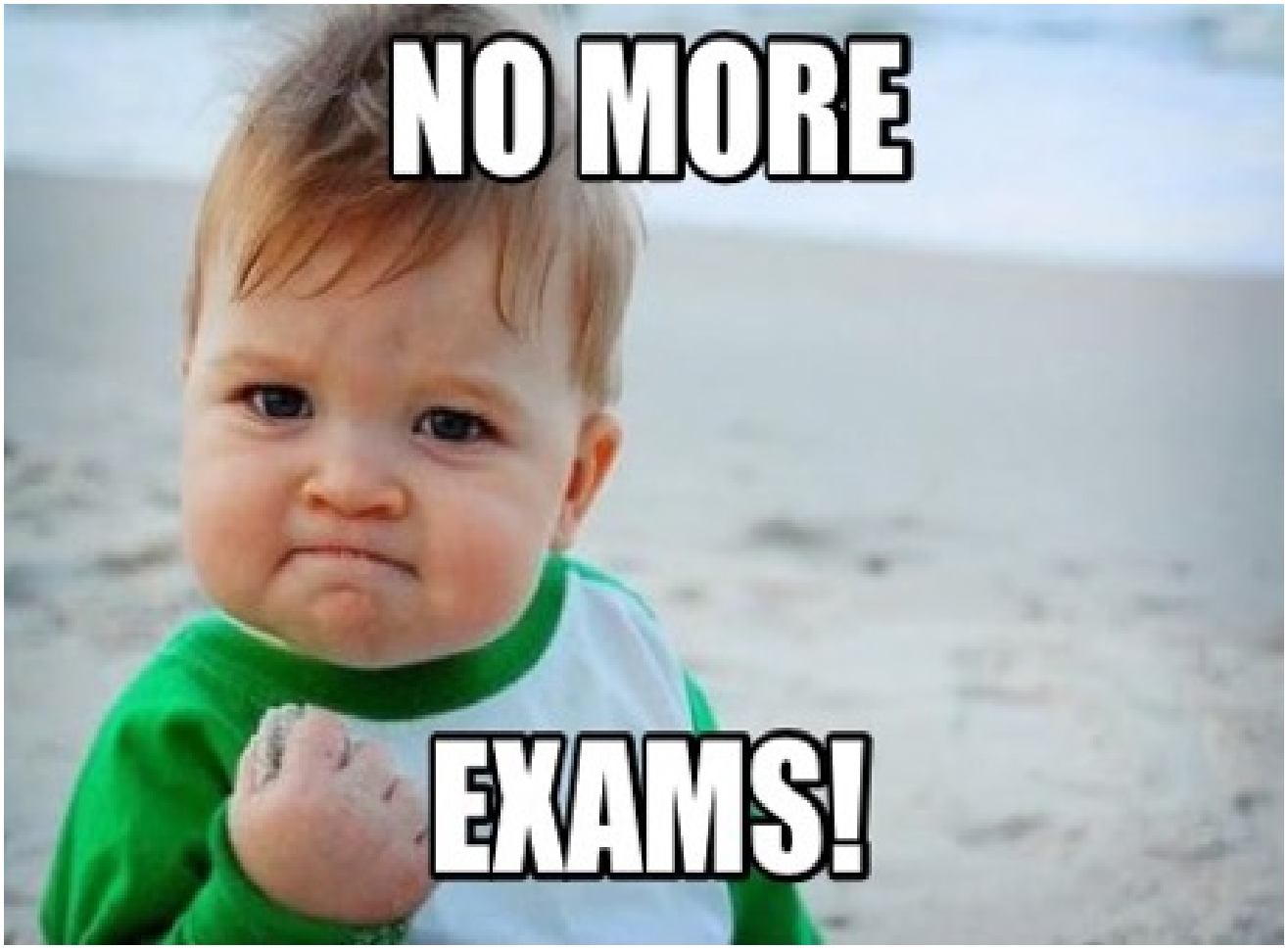
Project

- Work in groups of 4.
- Develop a new lab for the class.
- In the same way as the class labs are.
- You pick the topic, but it must include a practical element.
- More information later on.

Labs

- Done in and out of class.
- Require login to provided virtual machine.
  - **Must be on Rose-Hulman VPN to access it.**
  - Can be done on your own Linux machine, if it is beefy enough.
- Almost always there will be a lab sheet for you to fill out with the concepts you pick.
  - Observations.
  - Definitions of concepts.
  - Submitted via gradescope.
- Some labs may require writing an incident response report.

No Exams

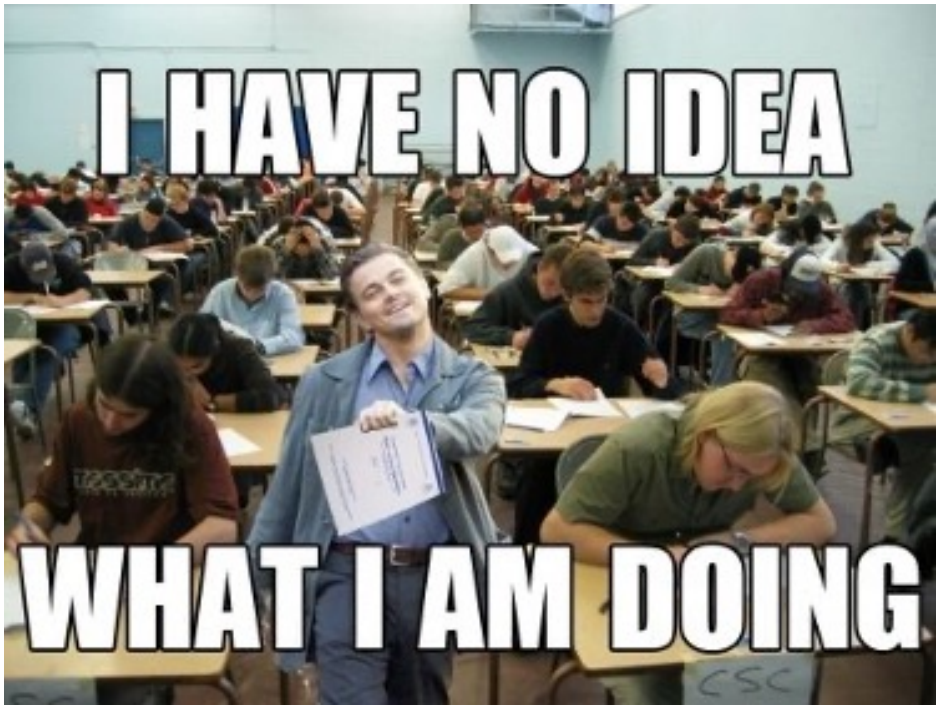


But, . . .

- Maybe a final exam.
- Crazy idea, not sure if doable.
- Set up a small network, give you access point.
- Give list of possible exploits.
- Map the network, find the topology, get to target server, get secret!
- Too ambitious but we'll see!

Help Wanted

- Course is very much still under development.
- Only second time offering it (previous infrastructure decommissioned).
- Please give feedback, open issues on `GitHub`.



What is a network?

What is security?

Why study network security?

What this class is not!

- Buffer overflow attacks.
- XSS scripting.
- SQL injection.
- Spectre and Metldown.
- Password cracking.
- See CSSE 340 for more on those topics.