Cybersecurity in Networks

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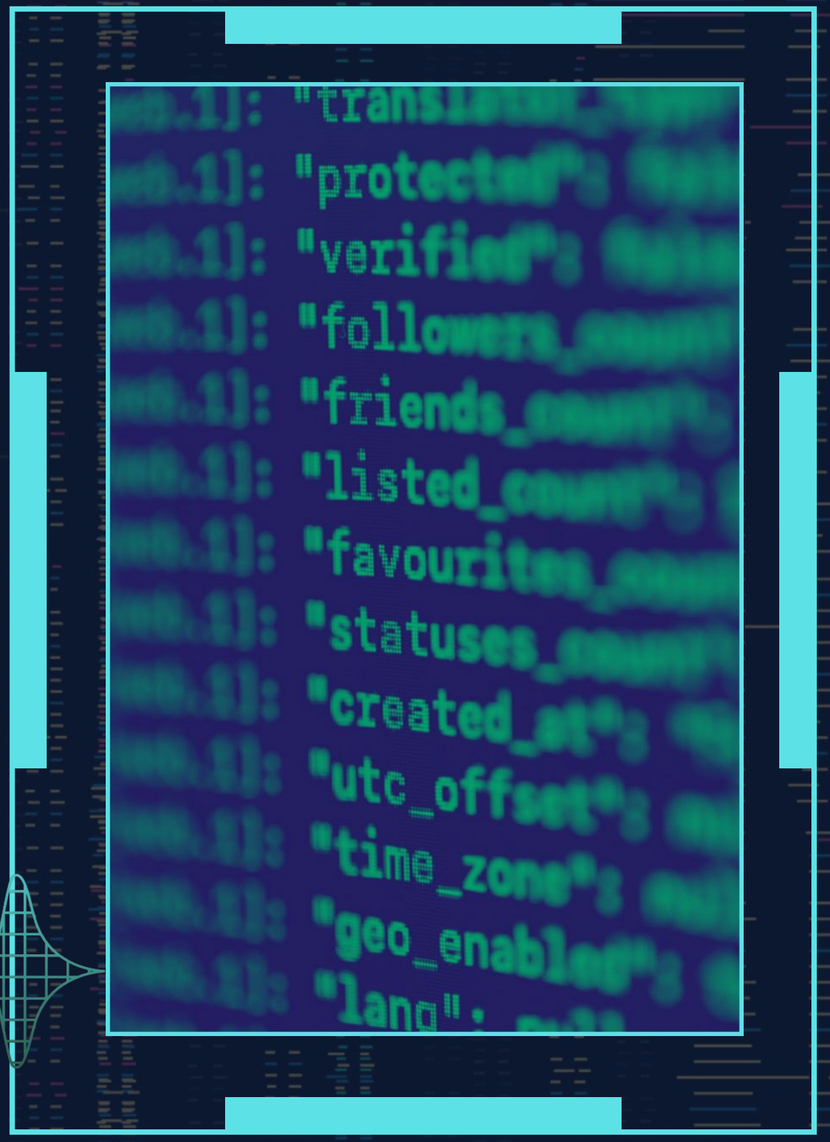

whoami

- Graduate of Computer Science at Dalhousie, Certificate in Communication Technology and Cyber Security
- Founder of the Dalhousie Cybersecurity Society (DCyS)
- 2 co-op terms with the Department of National Defence researching security hardening techniques on networks.
- Cybersecurity Enthusiast

Network Security

- Securing your software and system are important, but if your network is not secure, you're putting yourself or your business/company at risk of an attack. This includes cloud servers!

- Network security encompasses both cybersecurity and physical security.
  - Note: physical security is just as important as cybersecurity. If someone is able to walk into your server room and connect to your network devices, it can have devastating effects.

Components of Network Security:

- Firewalls
- Intrusion Detection/Prevention Systems (IDS & IPS)
- Access-Control
- Patching & Vulnerability Management
- Penetration Testing
- Loss Prevention Protocols & Procedure
- Network Traffic Monitoring/Analyzing
- and more...

Demo

Where can I learn more?

There are many different resources to learn more about cybersecurity, but these are my personal favourites:

- Cisco Packet Tracer and Cisco Networking Academy
  - https://www.netacad.com/cisco-packet-tracer
- SANS Holiday Hack/Kringlecon
  - Takes place in November/December every year.
  - Previous years are still available to play, and guides are available for challenges, so it's a great way to try something new and learn how to complete challenges you've never tried before.
  - https://www.sans.org/mlp/holiday-hack-challenge-2024/
- Podcasts:
  - Cybersecurity Today (https://www.itworldcanada.com/podcasts/cyber-security)
  - Darknet Diaries (https://darknetdiaries.com/)
- NetworkChuck (https://www.youtube.com/@NetworkChuck)
  - Interesting projects you can often follow along with, focuses on penetration testing and ethical hacking.
- Certificates & Free Training:
  - ISC2 Certified in Cybersecurity (CC) - Free Training and Exam (https://www.isc2.org/landing/1mcc)
  - CCNA - ShiftKey Academy Reimbursement Program (https://shiftkeylabs.ca/reimbursement-program)

Tools

Recommendation: Keep a curated list of tools that work for you. These are some of mine, but there are alternatives to many of these tools and some work better than others depending on the scenario.

- Cipher Identifier - useful for when you're trying to identify a cipher to be solved, links the tool to decipher it based on what it believes the cipher could be encrypted with.
- Microsoft Visio/draw.io - for drawing network diagrams
  - draw.io is completely free but web-based
  - Microsoft Visio is free while a Dalhousie student and has an app but some features are paywalled
- Overleaf - LaTeX document editor, good for keeping project documentation
  - I recommend finding a Technical Document template (or making your own) and using it for all projects
- Kali Linux and your preferred hypervisor (i.e., VMWare)
  - Although Kali Linux is often considered an "all-in-one" OS requiring minimal setup, I highly recommend that once you test out the tools it comes pre-installed with, you remove everything you don't use.
- Ubuntu/Rocky Linux
  - I recommend having a Linux VM you can delete and re-make easily for CTFs, projects, and general testing. Be careful what you download even on a VM, as it is still on your network.
- Wireshark - Network Packet Monitoring

Relevant Courses at Dalhousie

If you're interested in pursuing Cybersecurity/Network Security in your degree, these are my recommendations for courses. Research the courses yourself and/or speak to your academic advisor about what's right for you, these are just courses I took or think are relevant. It's not necessarily possible to take all of them, pick and choose based on your specific interests and schedule!

- CSCI 2201: Intro to Information Security
- CSCI 3171: Network Computing
- CSCI 3172: Web-Centric Computing
- CSCI 4101: Privacy & Access for the IT Professional
- CSCI 4116: Cryptography
- CSCI 4169: Usable Privacy and Security
- CSCI 4171: Networks and Communications
- CSCI 4174: Network Security
- CSCI 4178: Cyber Security and Defense

Note: Some of these courses build into the Communication Technology and Cyber Security certificate. To learn more, visit:
https://www.dal.ca/faculty/computerscience/undergraduate-programs/program-planning/certificates.html

Thank you!

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