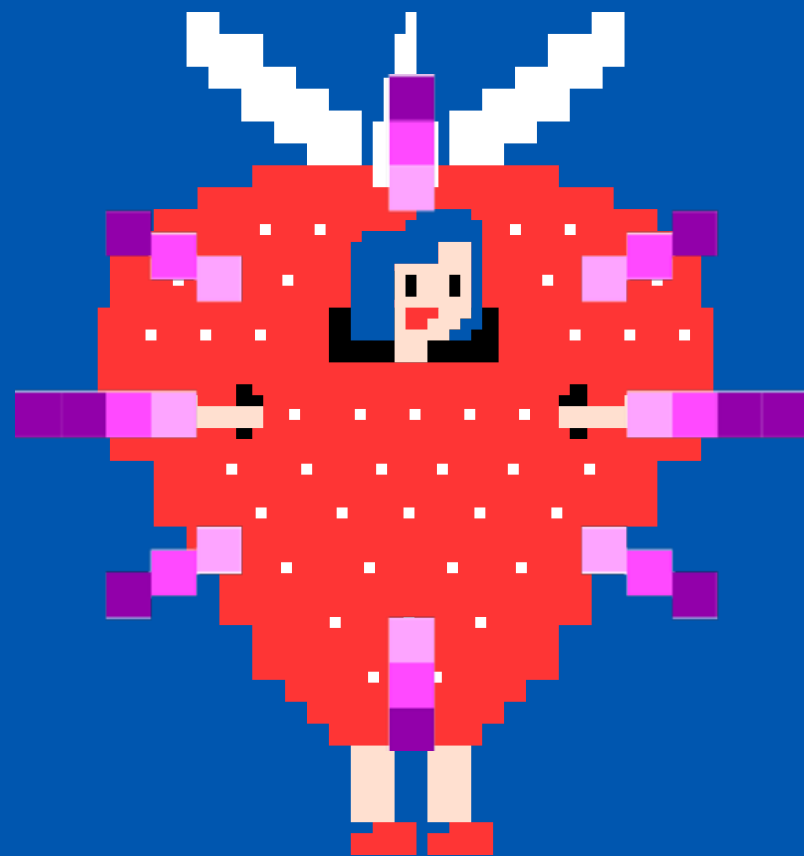
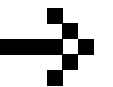


From Zero to Hero



# > GETTING STARTED IN CYBERSECURITY

Learn Cybersecurity on your own and beyond





# AGENDA

## Topics Covered

0x1-What is Cybersecurity.

0x2-Cybersecurity Roadmap

0x3-CTF as a learning tool

0x4-Tips and tricks

# Aldwin Tapican

## Whoami:

- 3rd Year BSCS Student in NEU
- Security Researcher
- Active CTF
- Backend Developer: Django and bootstrap 5
- CBI CICS Officer and ACSS Officer



<http://aj-tap.github.io>



# Cybersecurity

Practice of protecting computer systems, networks, and sensitive data from theft, damage, or unauthorized access.



## Offensive security

- Hack things before threat actors do
- Simulate real-world cyberattacks and attempt to breach the organization's defenses in order to identify **vulnerabilities** and weaknesses.

## Defensive Security

- Improve security gaps before adversaries find them.
- Monitoring network traffic for suspicious activity, and implementing firewalls and other security measures to prevent unauthorized access.



**improve the organization's overall security posture**



# WHY CYBERSECURITY?

Among the key findings of the report, it notes that demand for cybersecurity talent is high and continuing to grow, with a projected global workforce gap of 3.12 million professionals

--- International Information System Security Certification Consortium (ISC)<sup>2</sup>



- **There still aren't enough cybersecurity workers to meet demand**

A key indicator is the ratio of currently employed cybersecurity workers to new openings, which gives an indication of how big the worker shortfall is. The supply-demand ratio is currently 68 workers per 100 job openings, edging up from the previous period's ratio of 65 workers per 100 openings. Based on these numbers, we need nearly 530,000 more cybersecurity workers in the US in order to close current supply gaps.

## DARKReading

The Edge

DR Tech

Sections ↕

Events ↕

Remote Workforce

🕒 4 MIN READ 📰 NEWS

## Cybersecurity Jobs Remain Secure Despite Recession Fears

Only 10% of corporate executives expect to lay off members of cybersecurity teams in 2023, much lower than other areas, as companies protect hard-to-find skill sets.

## CYBERSECURITY DIVE

Deep Dive Library

Strategy Breaches Vulnerability Cyberattacks Threats Leadership

## The cybersecurity talent shortage: The outlook for 2023

The available potential workforce isn't keeping pace with demand, and experts blame a lack of interest from young people entering the job market.

Published Jan. 5, 2023

Over the last three years, **87%** of organizations reported actively seeking to meet diversity goals when hiring new graduates

Source: Fortinet 2022 Cybersecurity Skills Gap Global Research Report

<https://cloud.connect.isc2.org/career-pursuers-report>

[https://www.nist.gov/system/files/documents/2022/07/06/NICE%20FactSheet\\_Workforce%20Demand\\_Final\\_20211202.pdf](https://www.nist.gov/system/files/documents/2022/07/06/NICE%20FactSheet_Workforce%20Demand_Final_20211202.pdf)[technology/information-security-analysts.htm](https://technology/information-security-analysts.htm)



# Careers in Cyber

Here are some reasons to consider a career in cybersecurity:

- High Salary - Security jobs have lucrative starting salaries.
- Excitement - Work in this field can involve legally hacking systems or defending against cyberattacks, which is thrilling and challenging.
- High Demand - There is an enormous gap of over 3.5 million unfilled cyber positions globally.



Incident Responder



Security Analyst



Digital Forensics Examiner



Security Engineer



Penetration Tester



Red Teamer



Malware Analyst



# RECENT THREATS 2023

**DARK**Reading

Application Security | 1 MIN READ | QUICK HITS

## AI-Created YouTube Videos Spread Around Malware

AI-generated videos pose as tutorials on how to get cracked versions of Photoshop, Premiere Pro, and more.



videos pretending to be step-by-step tutorials on how to access programs

**DARK**Reading

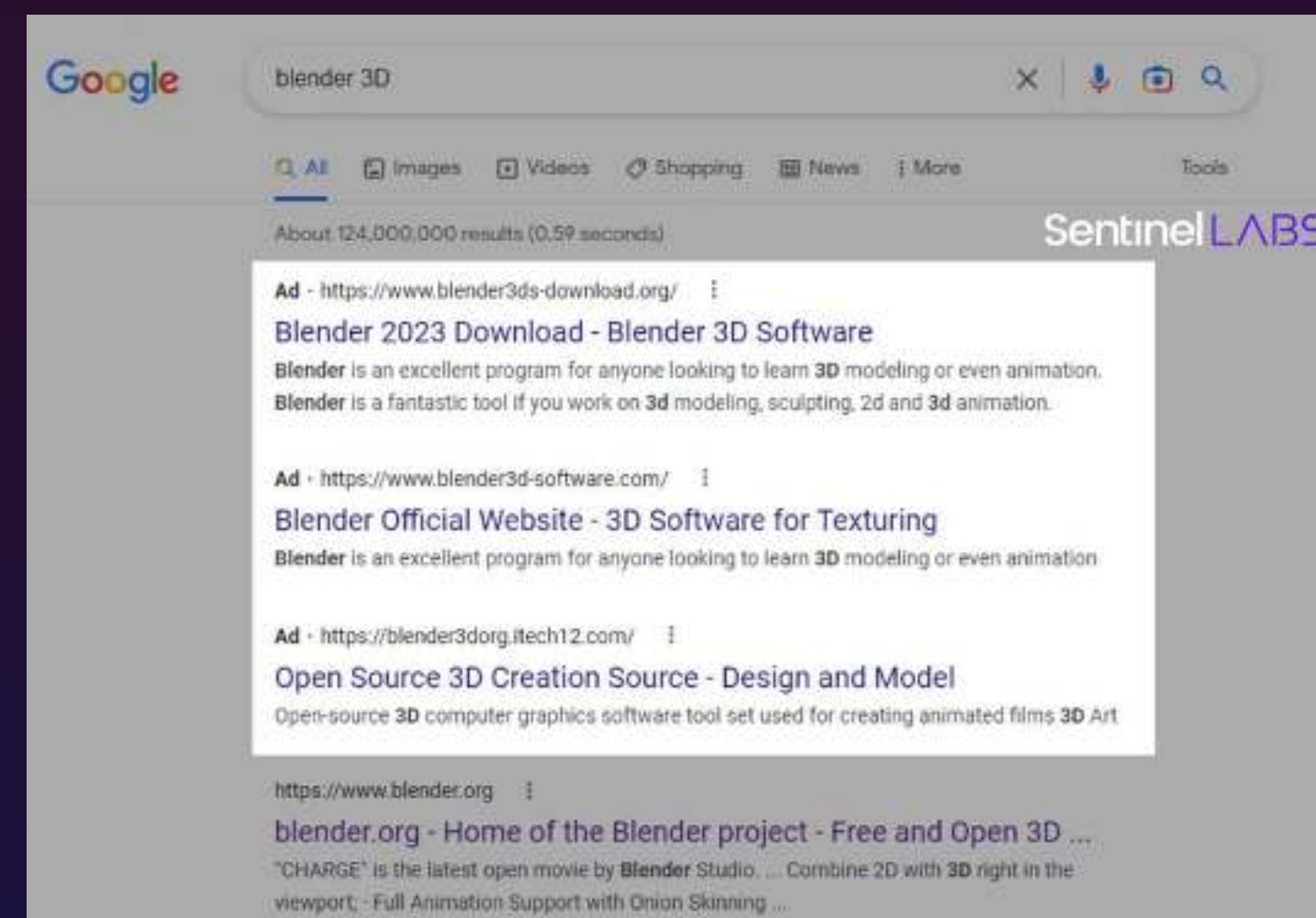
## Infostealer Malware Market Booms, as MFA Fatigue Sets In

The successful combo of stolen credentials and social engineering to breach networks is increasing demand for infostealers on the Dark Web.

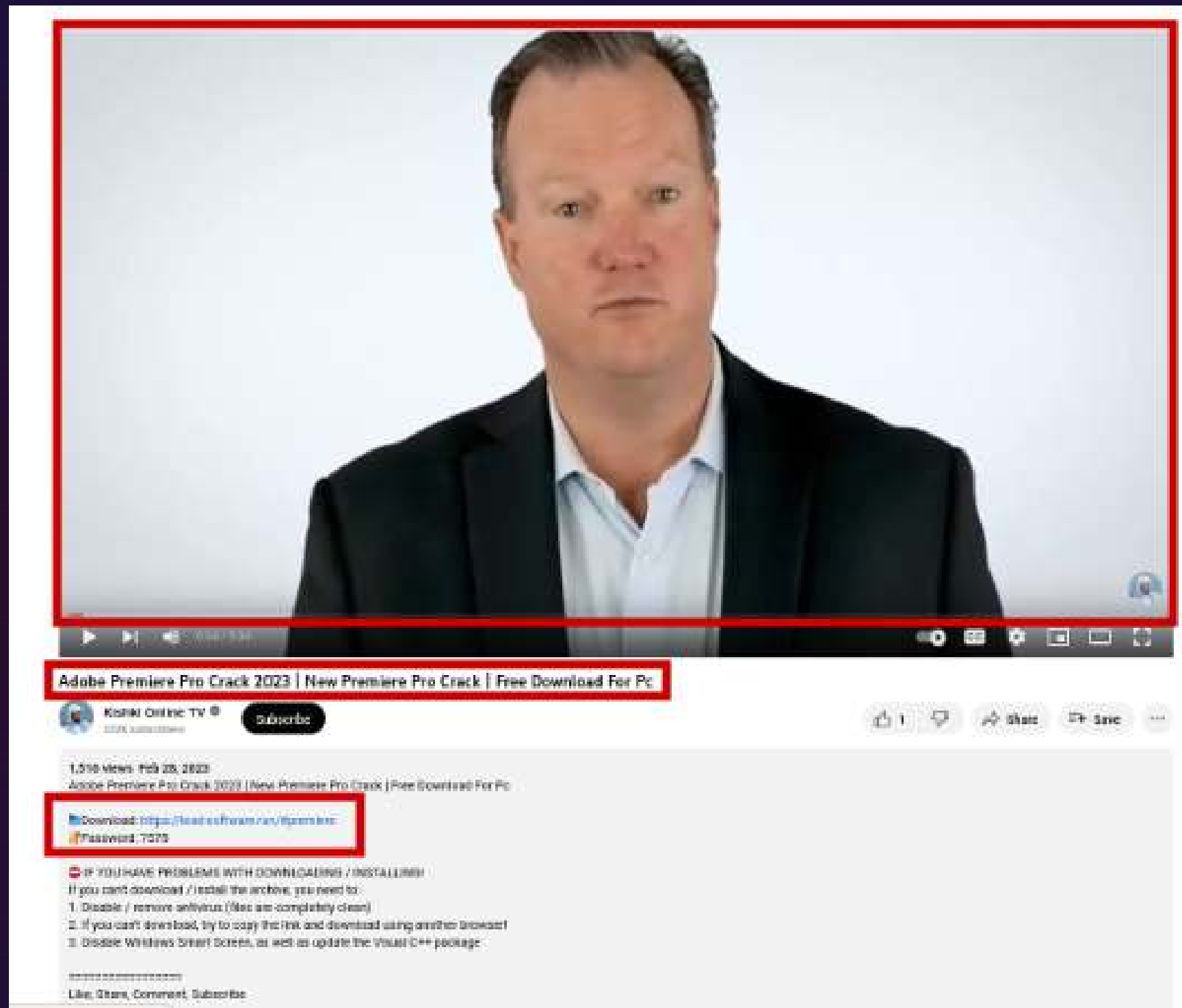
<https://www.darkreading.com/application-security/ai-creating-compelling-youtube-videos-loaded-with-malware->  
<https://www.darkreading.com/threat-intelligence/infostealer-malware-market-booms-mfa-fatigue>  
<https://www.sentinelone.com/blog/breaking-down-the-seo-poisoning-attack-how-attackers-are-hijacking-search-results/>  
<https://blog.sekoia.io/steal-a-copycat-of-vidar-and-raccoon-infostealers-gaining-in-popularity-part-1/>



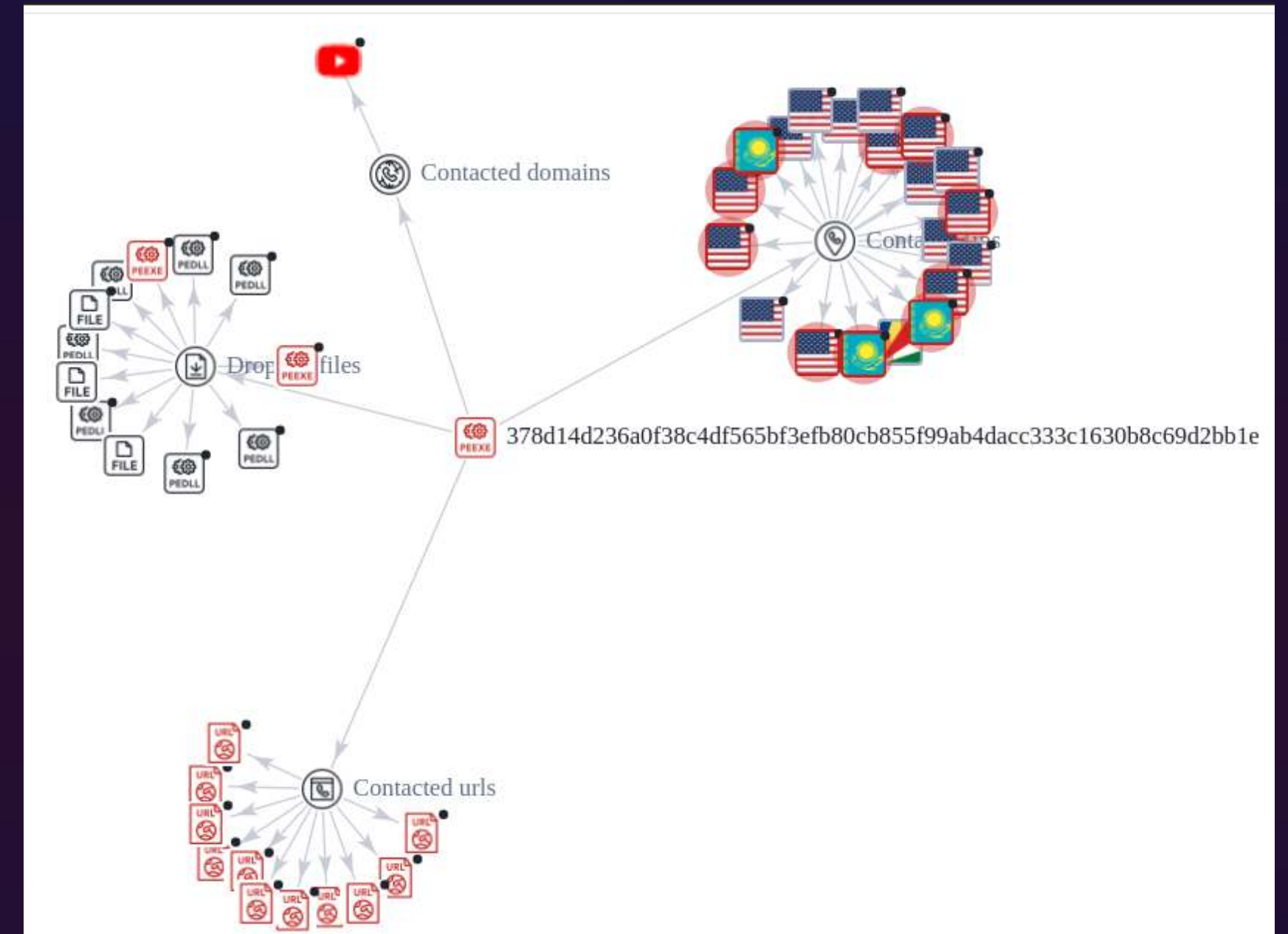
Malicious Facebook ads pretending legitimate



Malicious Google Search results (Sentinel Labs)



AI-Generated YouTube videos contain links to information-stealing malware such as Vidar, RedLine, and Raccoon.



VT-Graph shows the contacted domains that have been interacted with by the malware and also malicious files that have been downloaded.



# DEMO TIME

## Typical Malware infection sequence

### Victim's perspective

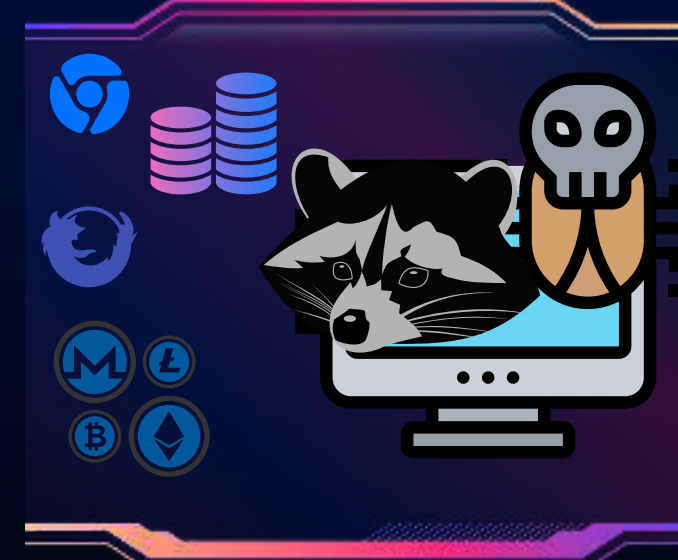


### Threat actor's perspective



## Information Stealer Malware

### Raccoon Stealer

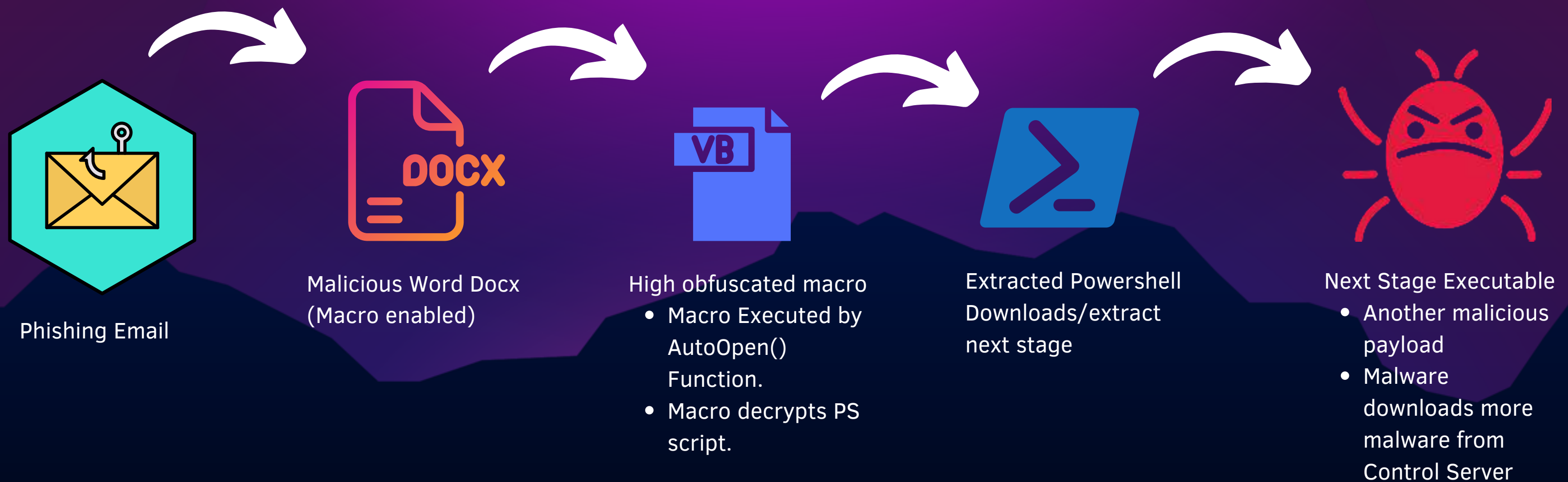


### Redline Stealer



## RECAP DEMO TIME

### Infection chain scenario Malicious Word Document Pathway





## RECAP DEMO TIME

### Blue team

Performs :  
Malware Triage and gather  
Indicator of Compromise (IOCs)

Tools used:

- Windows 10 FlareVM
  - Wireshark
  - procexp
  - Sublimetext

### Red Team

Performs :  
Simulate the attack  
Crafted a Malicious Document  
and malicious payload.  
Setup a Meterpreter listener.

Tools used:

- Parrot OS
  - Metasploit Framework.
  - MSF venom.
  - Python HTTP.
  - Powershell scripts.

# 3 Phase Cybersecurity Roadmap





# Year One: The Fundamentals

## Windows/Linux

- Install, Configure, Adminster
- Windows Internals
- Secure and Harden
  - CIS Benchmarks

## Virtualization

- Basics of Virtualization
- Virtualbox/Vmware/QEMU

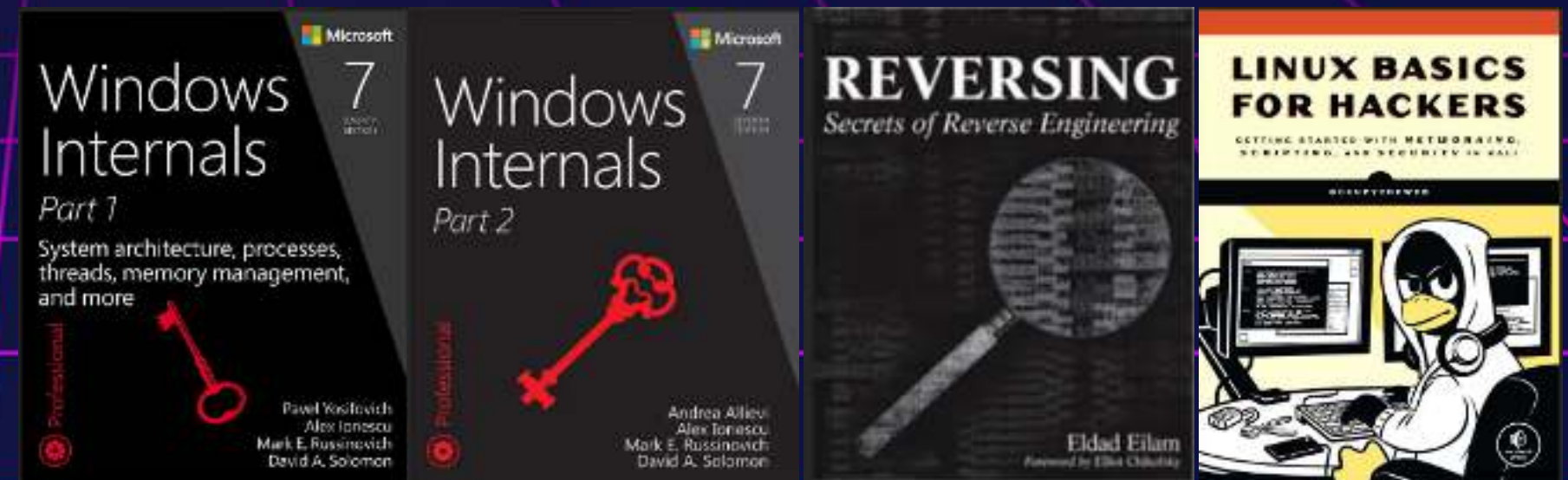


## Operating Systems

### Links:

- <https://tryhackme.com/room/linuxfundamentalspart1>
- <https://tryhackme.com/room/windowsfundamentals1xbx>
- <https://www.ibm.com/topics/virtual-machines>
- <https://linuxjourney.com/>
- <https://www.debian.org/doc/manuals/debian-handbook/index.en.html>
- <https://docs.microsoft.com/en-us/sysinternals/>
- <https://www.cisecurity.org/cis-benchmarks>

### Books:





# Year One: The Fundamentals



## Networking and Web Development

### Links:

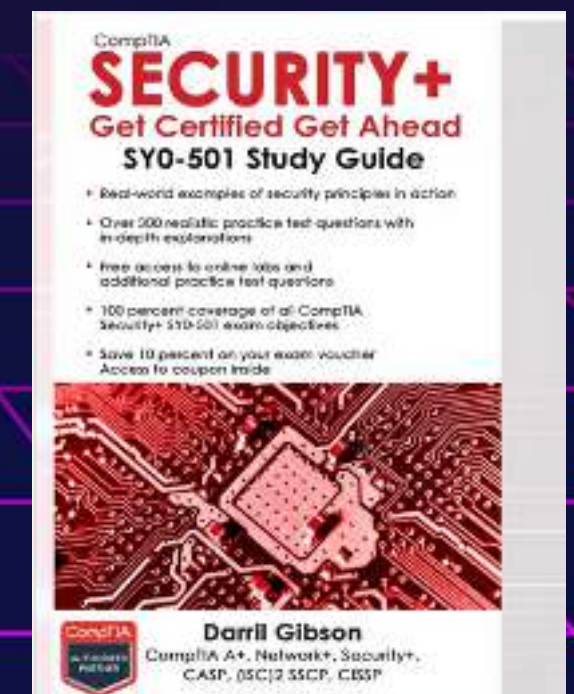
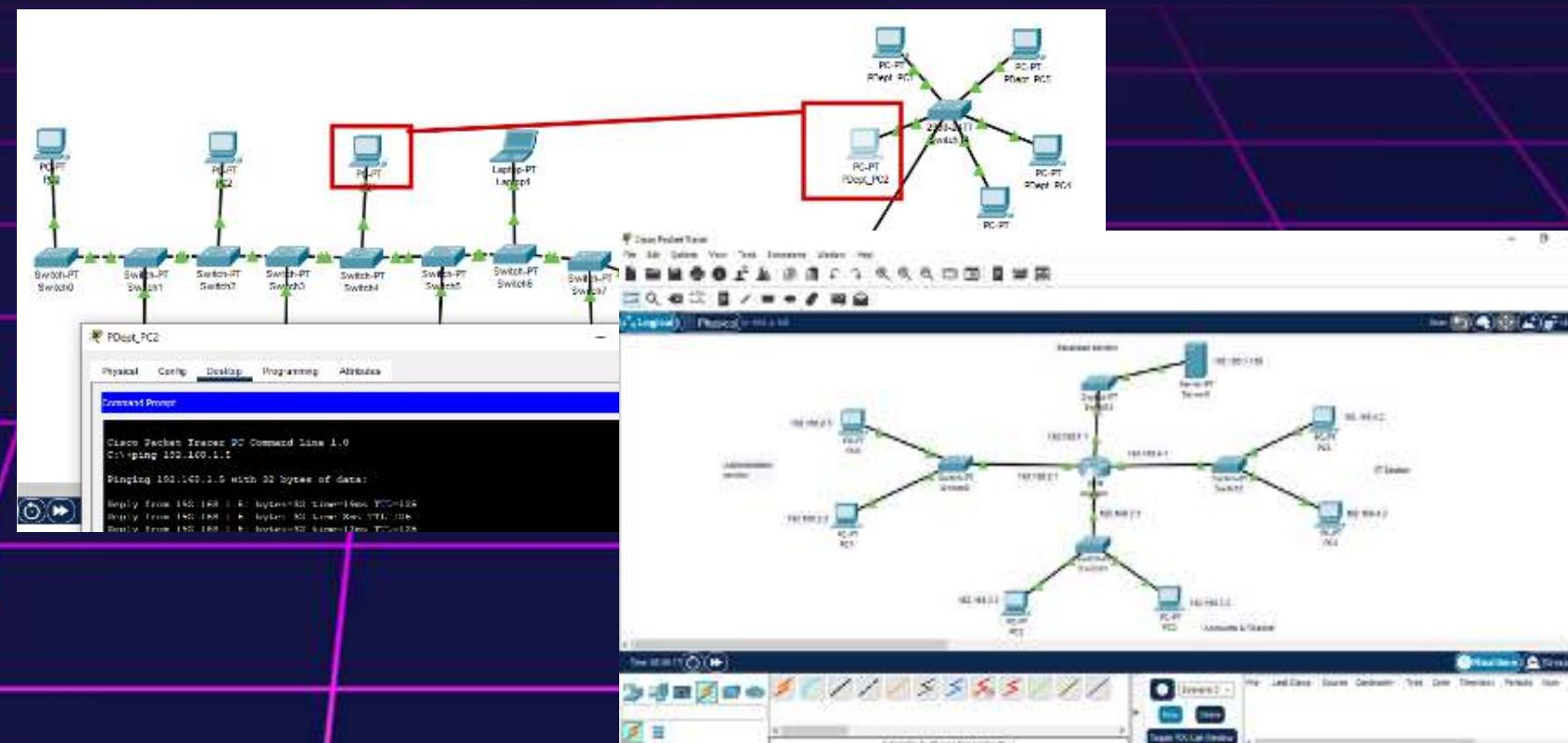
- <https://www.softwaretestinghelp.com/computer-networking-basics/>
- <https://www.guru99.com/data-communication-computer-network-tutorial.html>
- <https://www.netacad.com/courses/packet-tracer>
- <https://skillsforall.com/course/exploring-networking-cisco-packet-tracer>
- <https://www.netacad.com/courses/networking>
- <https://www.freecodecamp.org/>

### OSI/TCP Model

- Understand the layers make up the model.
- Common protocols like HTTP, SSH, FTP, SMB, SMTP etc.

### Web Development

- HTML, CSS, Javascript
- Web stacks: LAMP, MERN, Django, ASP.NET, etc.





# Year One: The Fundamentals

## Programming skills and Knowledge

- Powershell/bash scripts
  - Automate your daily tasks
- Start Simple with Python
- Go
- Javascript
- C++
- Develops intuition

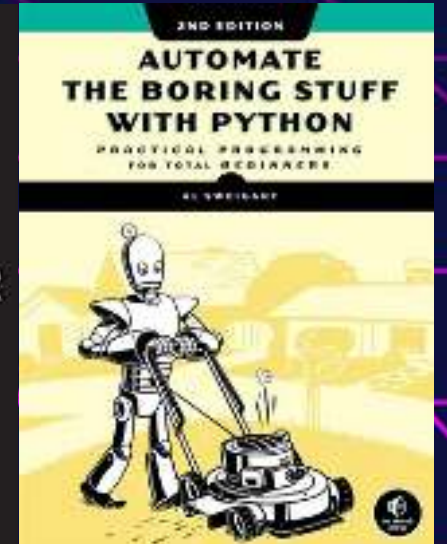
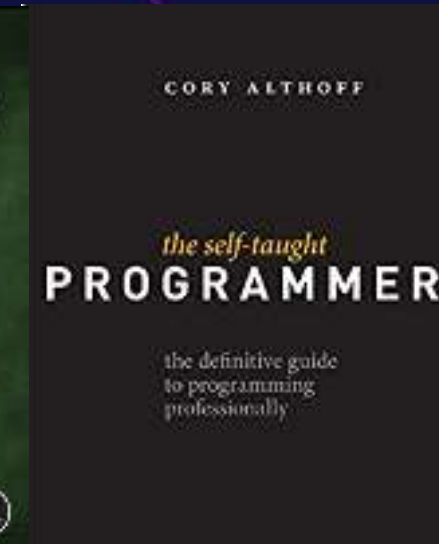
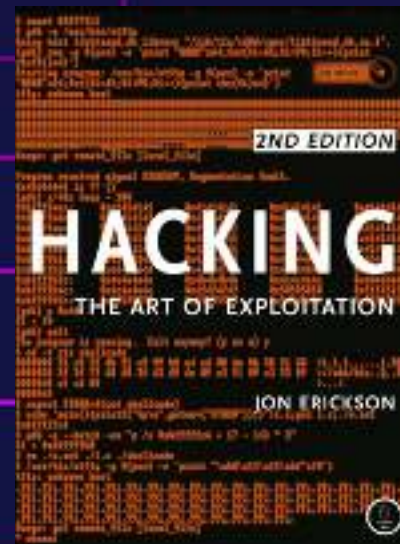


## Programming languages

### Links:

- <https://learn-bash.org/>
- <https://www.learnpython.org/>
- <https://www.learn-c.org/>
- <https://www.learn-cpp.org/>
- <https://nodejs.dev/en/learn/>
- <https://dev.java/learn/>
- <https://learn.microsoft.com/en-us/training/modules/introduction-to-powershell/>

### Books:





# Year Two: Cybersecurity Concepts



## Security Fundamentals

### Links:

- <https://csrc.nist.gov/glossary>
- <https://www.nist.gov/cyberframework>
- <https://www.nccoe.nist.gov/publication/1800-25/VoIA/index.html>
- <https://www.cisecurity.org>
- <https://owasp.org/Top10/>

## Security Concepts

- Information Security Terminologies
- CIA Triad Model
- Attacks, threats, vulnerabilities, risk

## Security Standards

- National Information Security Technology (NIST) Standard Specification
  - RMF
  - Cybersecurity Framework
- CIS (Center for Internet Security)





# Year Two: Cybersecurity Concepts

## Pentesting Fundamentals

- PTES
- MITRE ATTACK
- Cyber Kill Chain
- OWASP Top 10
- OWASP Security Testing Guide
- Analyze open source reports pentest
- Understand Common Security suite and tools.



## Frameworks/Methodology

### Links:

- [http://www.pentest-standard.org/index.php/Main\\_Page](http://www.pentest-standard.org/index.php/Main_Page)
- <https://attack.mitre.org/>
- <https://www.lockheedmartin.com/en-us/capabilities/cyber/cyber-kill-chain.html>
- <https://www.unifiedkillchain.com/>
- <https://nvlpubs.nist.gov/nistpubs/specialpublications/nist.sp.800-61r2.pdf>
- <https://owasp.org/www-project-top-ten/>
- <https://github.com/Sector443/awesome-list-of-public-pentesting-reports>

MITRE ATT&CK IS AUTHORITATIVE & COMPLETE

### PRE-ATT&CK™



Priority Definition  
Target Selection  
Information Gathering  
Weakness Identification  
Adversary OpSec



Establish & Maintain Infrastructure  
Persona Development  
Build Capabilities  
Test Capabilities  
Stage Capabilities

### ATT&CK™



Initial Access  
Execution  
Persistence



Privilege Escalation  
Defense Evasion  
Credential Access



Discovery  
Lateral Movement  
Collection

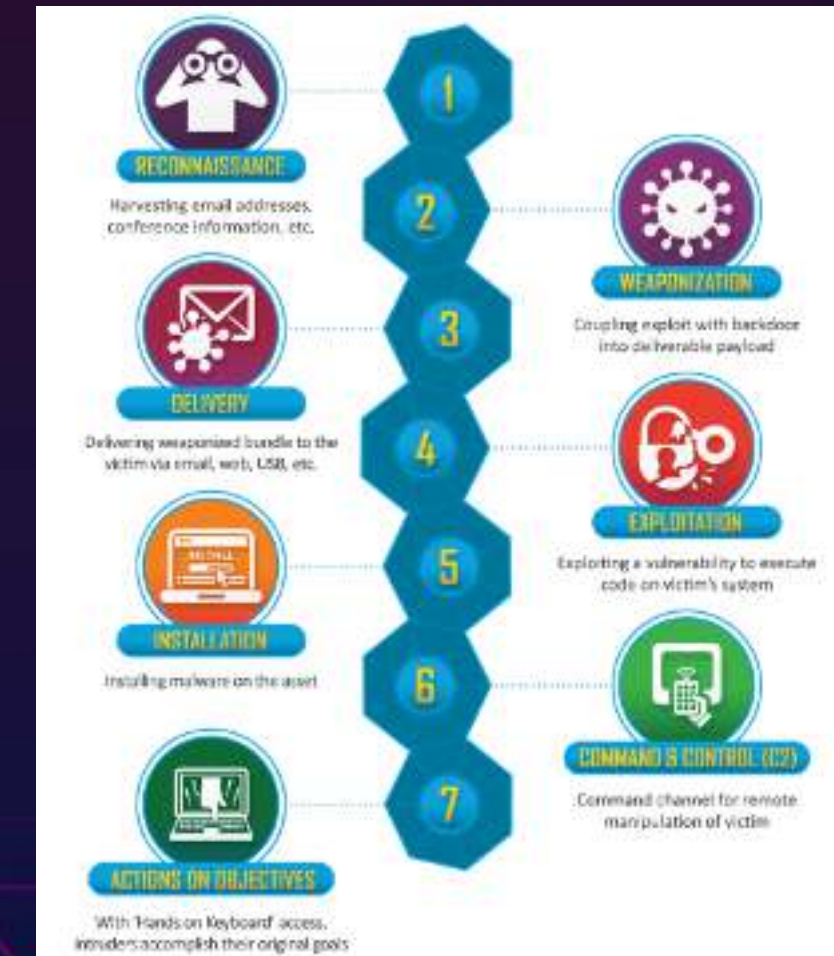


Exfiltration  
Command & Control



OWASP

TOP 10





# Year three: Getting hands dirty

## Attack & Defend

- Approach your learning with directness.
  - Gain an understanding of how adversaries operate and how to detect them. (Adversary Simulation)
  - Learn how Malware Operates and Types
  - Setup vulnerable server and attack it.
- CTFs
  - Participate, Identify your weak spots and improve!



## Autodidact learning + Practice

### Links:

- <https://book.hacktricks.xyz/welcome/readme>
- <https://portswigger.net/web-security>
- <https://github.com/digininja/DVWA>
- <https://www.vulnhub.com/>
- <https://github.com/ashemery/exploitation-course>
- <https://github.com/redcanaryco/atomic-red-team>

### Practices on platforms:



**VULNHUB**  
VULNERABLE BY DESIGN



10 10  
1110  
0101 01  
01 01

**Try  
Hack  
Me**



**picoCTF**



**HACKTHEBOX**

# Year four: Career hunt



Connect with professionals in the industry and submit a job application.

- LinkedIn, JobStreet, Facebook groups, university career fairs, webinars, and conferences.
- Volunteer works in Org
- Create a personal project, publish writeups, showcase your talent.
- Create a meaningful connection.
  - 50 meaningful > 1000 connections in linkedin
- Softskills Don't forget it ;)

Plaforms:



**JobStreet.com**

**indeed®**





# CTF: How the Best Hackers Learn Their Craft

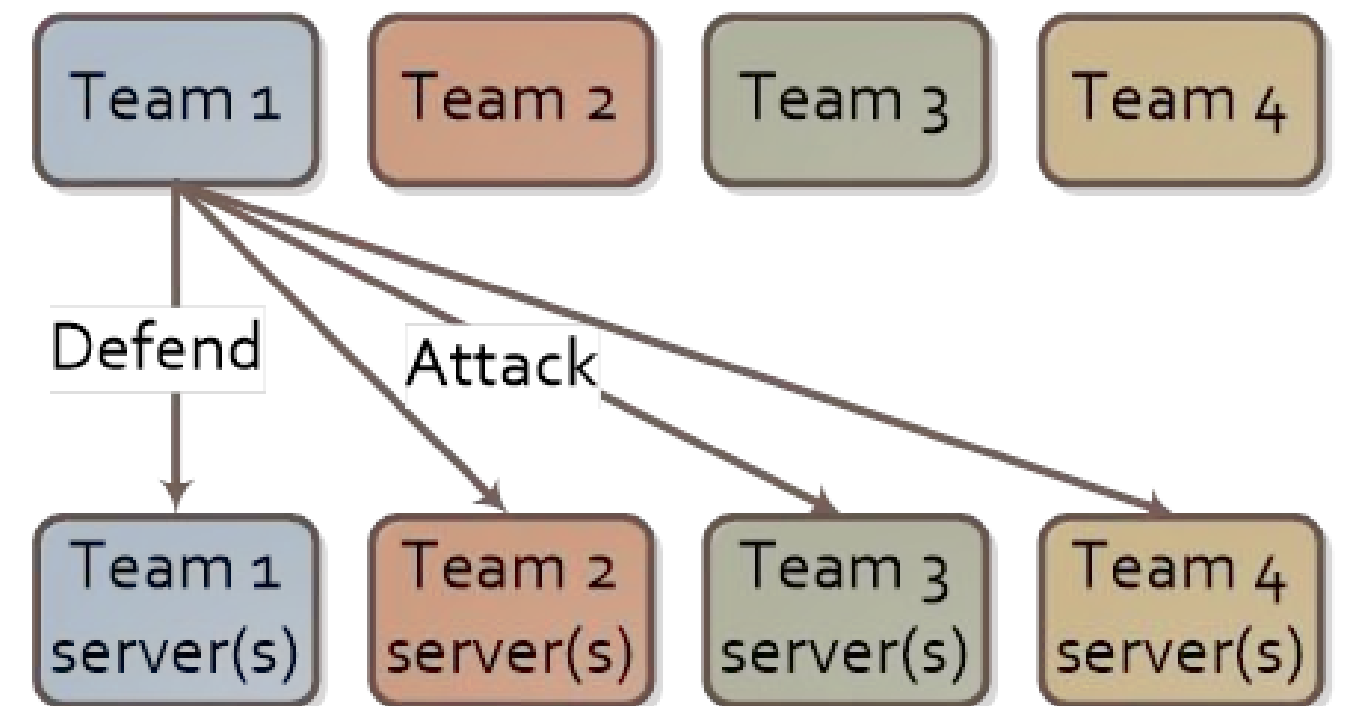


# Capture The Flag 101

## Jeopardy Style

Web	Crypto	Forensics	Reverse	Misc	Pwn
1	165	100	50	50	50
150	150	150	100	100	150
204	150	150	150	165	200
203	200	200	200	150	250
206	257	200	300	200	323
318	334	250	300	300	440
325	400	347	400		
	430	350			

## Attack-Defense






# Typical Jeopardy CTF Page

Cyber Apocalypse 2023 - ...

Challenges Scoreboard

 **Integer\_OverFlow**  
6 members

864TH RANK

5125 POINTS

18/74 CHALLENGES

18/74 FLAGS

Search challenges by name or category

Submit flag & press enter

**UNSOLVED** 6 REVERSING CHALLENGES

POINTS	DIFFICULTY	ASSIGNEE
Cave System 283 solves	300	easy
Alien Saboteur 76 solves	325	medium
Gimmick DSP 39 solves	350	medium
Vessel Cartographer 28 solves	375	hard
Somewhat Linear 102 solves	325	hard
Analogue Signal Process...	425	insane

**SOLVED** 4 REVERSING CHALLENGES

Warmup Pwn Web Blockchain Hardware Reversing ML Misc

Show More

Gamified  
learning



<https://ctf101.org/>

**REPLY** <CHALLENGES/> Discover Challenges ▾ Challenge Originals Referral program


Cyber Security Challenge About Learning Training Faq Rules **Your Challenge Page**

CODING	WEB	BINARY	CRYPTO	MISCELLANEOUS
<b>Travelling around the wor(l)ds</b> 100 pts Completed on 10/14/2022 @ 10:53 PM with 4 tries VIEW	<b>Dungeons &amp; Breakfast</b> 100 pts VIEW	<b>mlem</b> 100 pts VIEW	<b>Non-Fungible Rune</b> 100 pts VIEW	<b>Seek and ye shall find</b> 100 pts VIEW
<b>aMAZEing portals</b> 200 pts Completed on 10/15/2022 @ 1:36 AM with just one try! VIEW	<b>EmoGig!</b> 200 pts VIEW	<b>Link the Jump</b> 200 pts VIEW	<b>Don't forget the best Bits</b> 200 pts VIEW	<b>hIP hIP hooray</b> 200 pts VIEW
<b>sudo -r fog</b> 300 pts VIEW	<b>You sock</b> 300 pts VIEW	<b>Pluto is a (un)planet</b> 300 pts VIEW	<b>Be blob a lula</b> 300 pts VIEW	<b>Let the logo play</b> 300 pts VIEW
<b>Four steps to the top</b> 400 pts VIEW	<b>Berry There</b> 400 pts VIEW	<b>Portal communication system™ I</b> 400 pts VIEW	<b>It worked yesterday :)</b> 400 pts VIEW	<b>Signals from the multiverse</b> 400 pts VIEW
<b>boh.lol</b> 500 pts VIEW	<b>O' fish</b> 500 pts VIEW	<b>Portal communication system™ II</b> 500 pts VIEW	<b>TouringZ S.p.A.</b> 500 pts VIEW	<b>Broken Adventure Time</b> 500 pts VIEW

Showing 1 - 5 of 3723  
Last update on 10/20/2022 10:11 AM  
[Show all](#)

**SEE MORE STATS**

**my team:**  
**For the fun :D**



**DISCORD**

If you want to ask for help, you can access the private **Discord server** and join the community.

**GENERATE CODE**

**Ranking:**

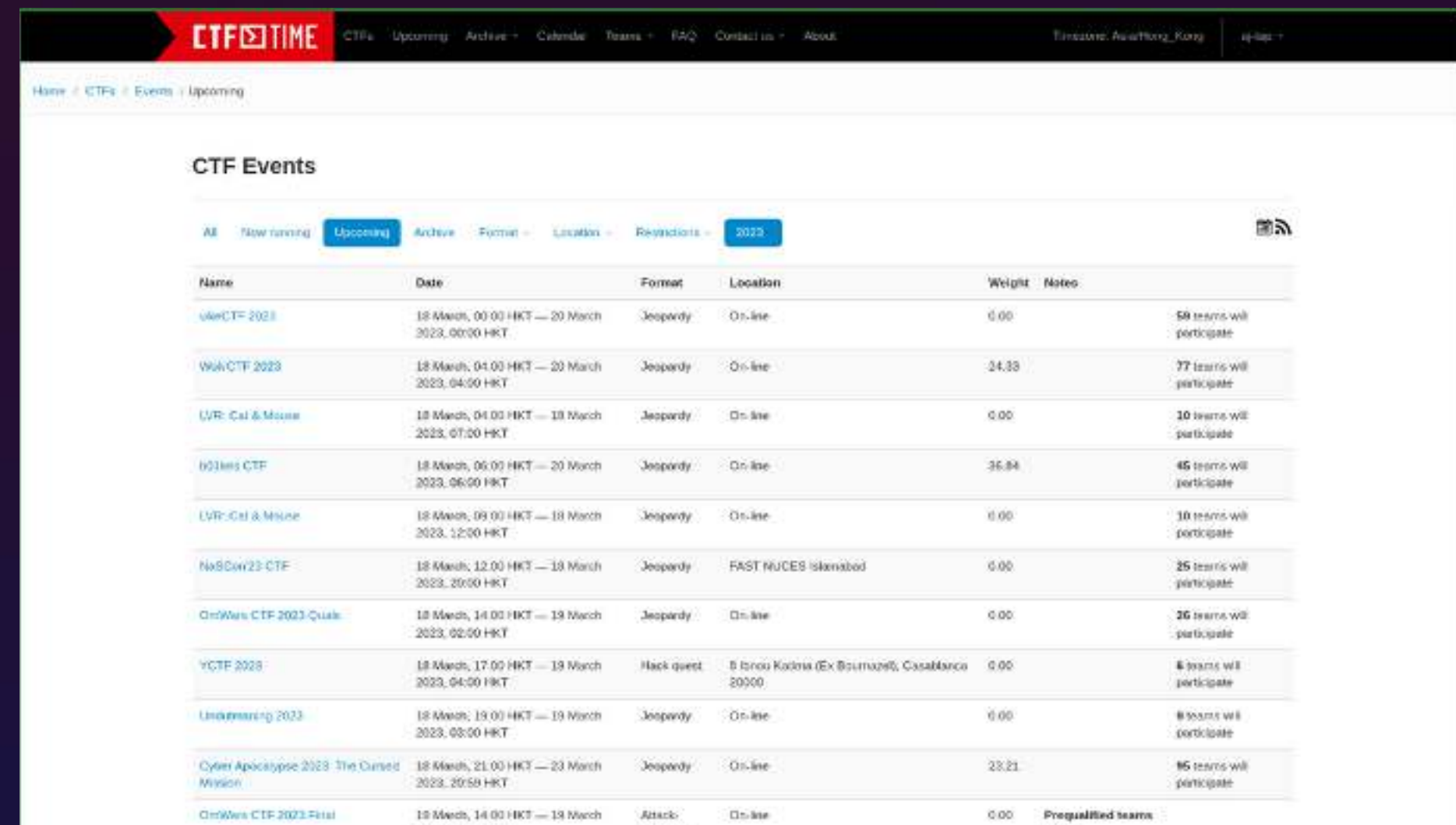
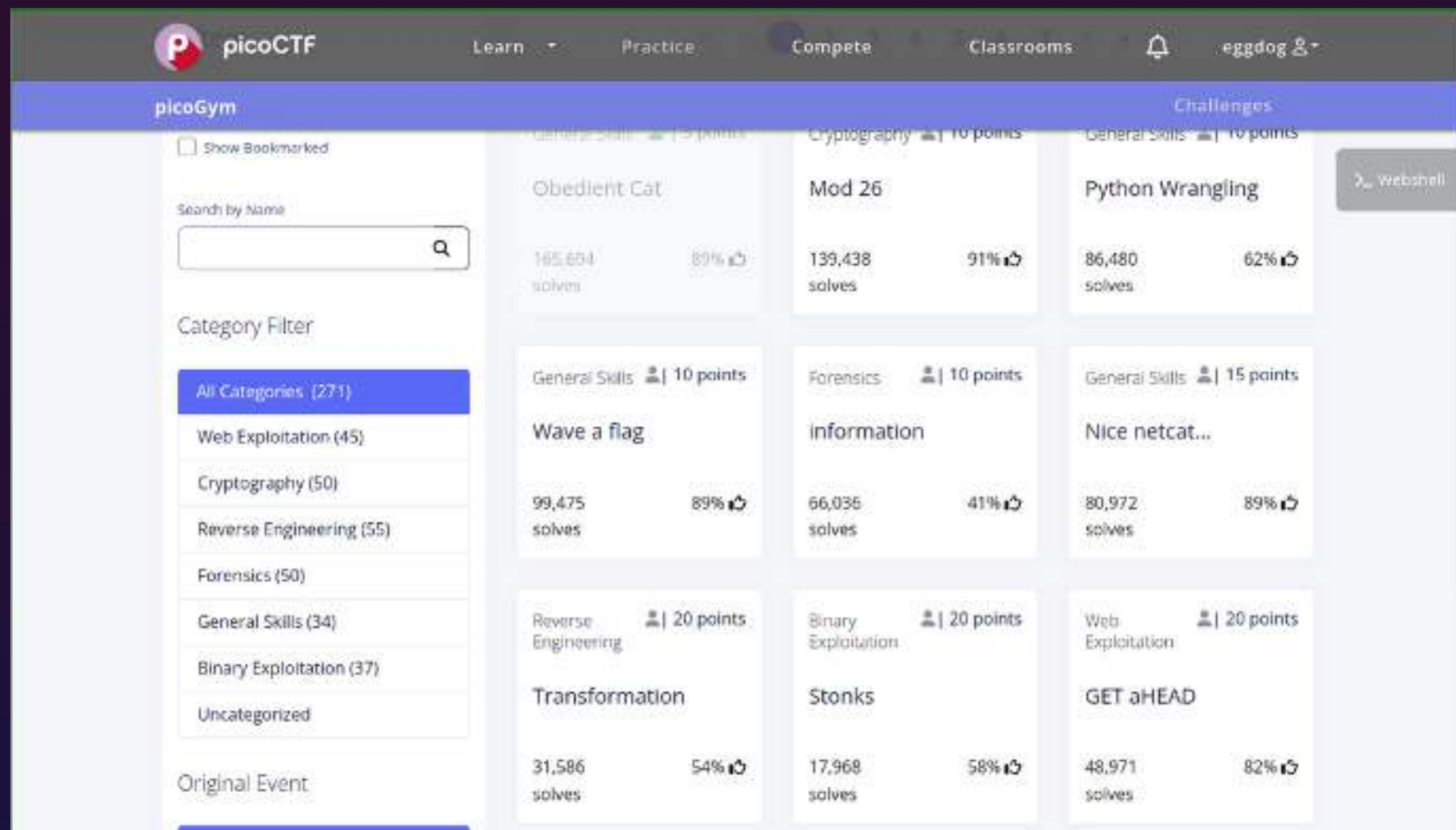
- WreckTheLine**  
[SEE THE SCORES](#)  
5.768 pts  
on 10/15/2022 7:26 PM
- Tower of Hanoi**  
[SEE THE SCORES](#)  
5.348 pts  
on 10/15/2022 7:00 PM
- ДГП КРҮ**  
[SEE THE SCORES](#)  
4.692 pts  
on 10/15/2022 2:13 PM
- fibonhack**  
[SEE THE SCORES](#)  
4.158 pts  
on 10/15/2022 6:04 PM
- Srdnlen**  
[SEE THE SCORES](#)  
3.564 pts  
on 10/15/2022 5:18 PM



## Where to find these CTF

# PicoCTF

## CTF Time



```
https://play.picoctf.org/practice
https://ctf101.org/
```

# CTF Examples Question

Obedient Cat



| 5 points

Tags: picoCTF 2021 General Skills

AUTHOR: SYREAL

Description

This file has a flag in plain sight (aka "in-the-clear").

[Download flag.](#)

Hints ?

1 2 3

165,691 solves / 170,261 users attempted  
(97%)



89%  
Liked



picoCTF{s4n1ty\_v3r1f13d\_f28ac910}

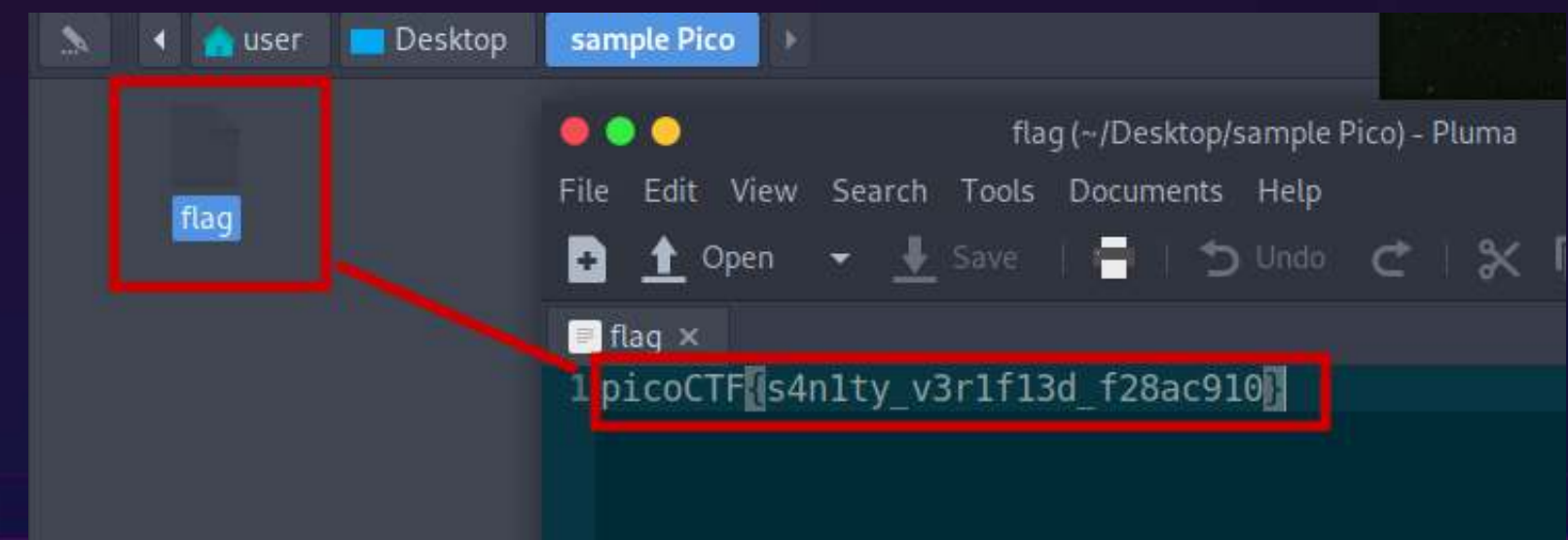
Submit  
Flag

Title

Short description

Attachment

Inputflag







# CTF SAMPLE CHALLENGE

## ★ Category: OSINT

File attachment name: WindowsXP.jpg



### Description:

What information can you possibly get with just one photo?

### Flags to capture:

- What is this users avatar of?
- What city is this person in?
- What is his personal email address?
- What site did you find his email address on?
- Where has he gone on holiday?
- What is this persons password?





# CTF CHALLENGE RECAP



Understand the problem by researching.

- Google
  - We search OSINT and stumble a Methodology called OSINT framework
  - We learn that Photos Contains Metadata.

```
$exiftool WindowsXP.jpg | grep Copyright
Copyright          : OWoodflint
```

Using Exiftool that we learn from OSINT framework we extract metadata of the file

- Copyright:OWoodflint



What is this users avatar of?  
Answer: Cat

Simple google search of Owoodflint will reveal his accounts.

- He tweeted a Bssid which near in his house.

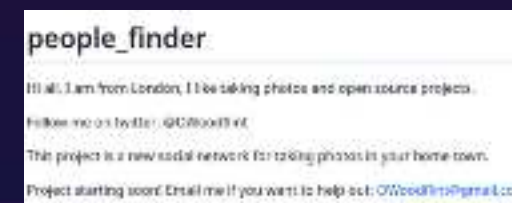


What is this persons password?  
Answer: pennYDrOppeR.!



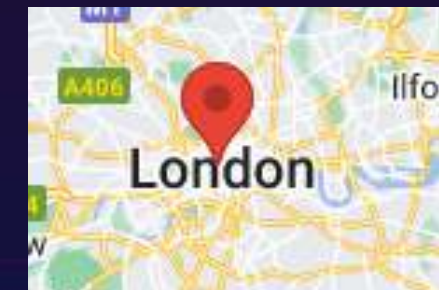
Where has he gone on holiday?  
Answer: OWoodflint@gmail.com

We also found his OWoodflint's wordpress flag.



What is his personal email address?  
Answer: OWoodflint@gmail.com

Looking to his github account we can find that he accidentally leaked his email in one of repository.



What city is this person in?  
Answer: London

By researching again we find out there is concept called "Wardriving" and based from OSINT Framework. Wigle is a database of wireless access points and cell tower locations

While doing the problem you constantly researching new topics we don't know and learn new concepts, techniques and methodologies.

# CTF Learning Process

## Principles of CTF

- Applied, deliberate practice
- Autodidactic Learning
- Creative Problem solving

4

## Reflections

- Look back
- taking the time to reflect and look back at what you have done
- Examine the solution obtained

3

## Implementation

- Carry out the plan
  - care and patience
- Persist with the plan that
- You have chosen. If it continues not to work discard it and choose another

1

## Analysis

- Understand the problem
- Most of the time you will encounter unknown problem.
- Research Skills
  - OSINT
  - Google the Topic

2

## Planning

- Guess and check
- Make an orderly list
- Eliminate Possibilities
- Look for a pattern
- Draw a picture
- Use a Model.





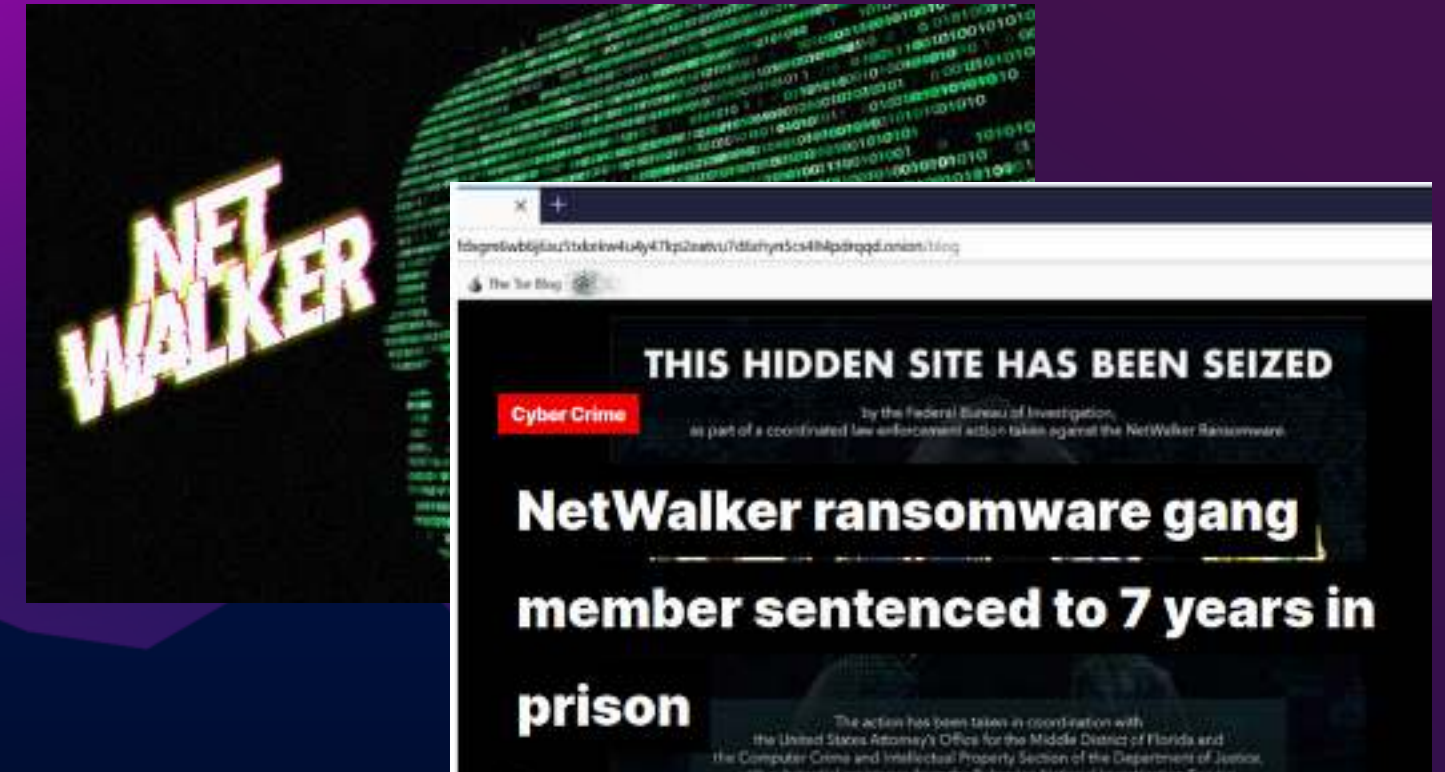
OSINT SKILLS CAN BE USED TO  
PROFILE CYBERCRIMINALS



Authorities soon tracked Sokolovsky's phone through Germany and eventually to The Netherlands, with his female companion helpfully documenting every step of the trip on her Instagram account.



Researchers who analyzed the malware found that it contained metadata that pointed to the use of a Russian-made programming tool called "Pelles C". The metadata also contained a reference to a file path that contained the username of the developer who created the malware.



“based on internet protocol addresses, data gleaned from US investigations into various Apple, Google, Microsoft, and Mega.nz accounts, aliases, email addresses, and personal information revealed on social media platforms, the Defendant was identified by the Canadian authorities,” court documents revealed.

<https://darknetdiaries.com/transcript/54/>  
<https://darknetdiaries.com/episode/58/>  
<https://www.hackread.com/netwalker-ransomware-gang-member-imprisoned/>  
<https://krebsonsecurity.com/2022/10/accused-raccoon-malware-developer-fled-ukraine-after-russian-invasion/>  
<https://www.pcmag.com/news/us-indicts-ukrainian-for-raccoon-stealer-malware-that-hit-millions-of-computers>





# Tips and tricks

# GATHERING RESOURCES



## Used book sale

- Cost effective
- Supplementary material
- Exam objectives remain the same
- Familiarity with older technologies
- Historical information

### Blue Team Training - LetsDefend 🤖

<https://letsdefend.io/>

50% off code: BLCKFRDY

Deal ends: 2nd December

### Offensive Security - Penetration Testing Training

<https://www.offensive-security.com/learn-one/>

20% off Learn One

Deal ends: 31st December

### SEKTOR7 Institute 🤖

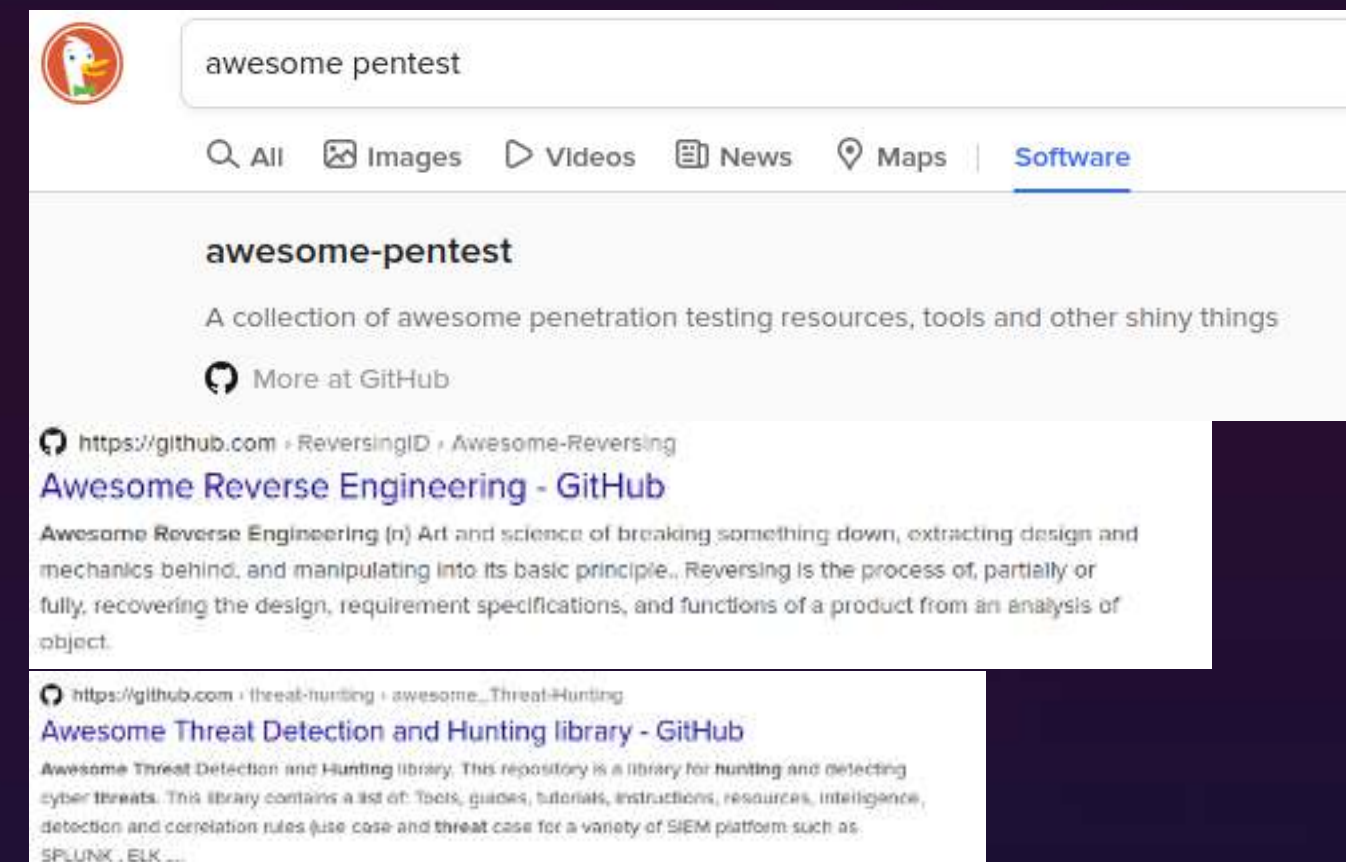
<https://institute.sektor7.net>

25% off regular price with code: BEFICOM-22

Deal ends: Cyber Monday

## Black Friday sales

- discounted Prices/Certifications/Training
- <https://github.com/0x90n/InfoSec-Black-Friday>



Google dorking or just simply search

Awesome <Topics> you can Currated list.



## HOW TO STAY UPDATED



### RSS Feed

convenient way to stay up-to-date with multiple websites and sources of information without having to visit each site individually.



### Twitter

Twitter is a great platform for staying up-to-date with the latest news and developments in the field of information security (InfoSec).



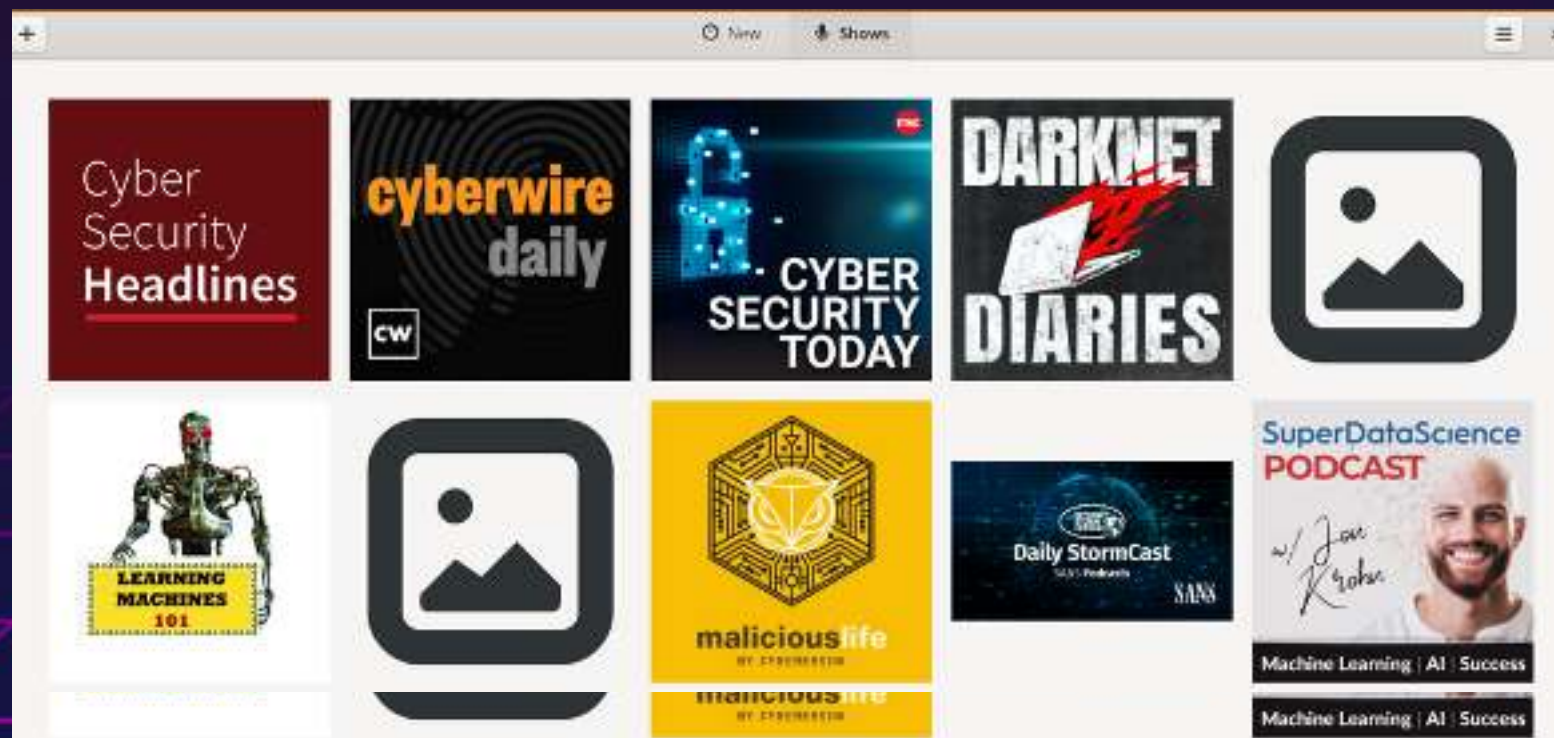
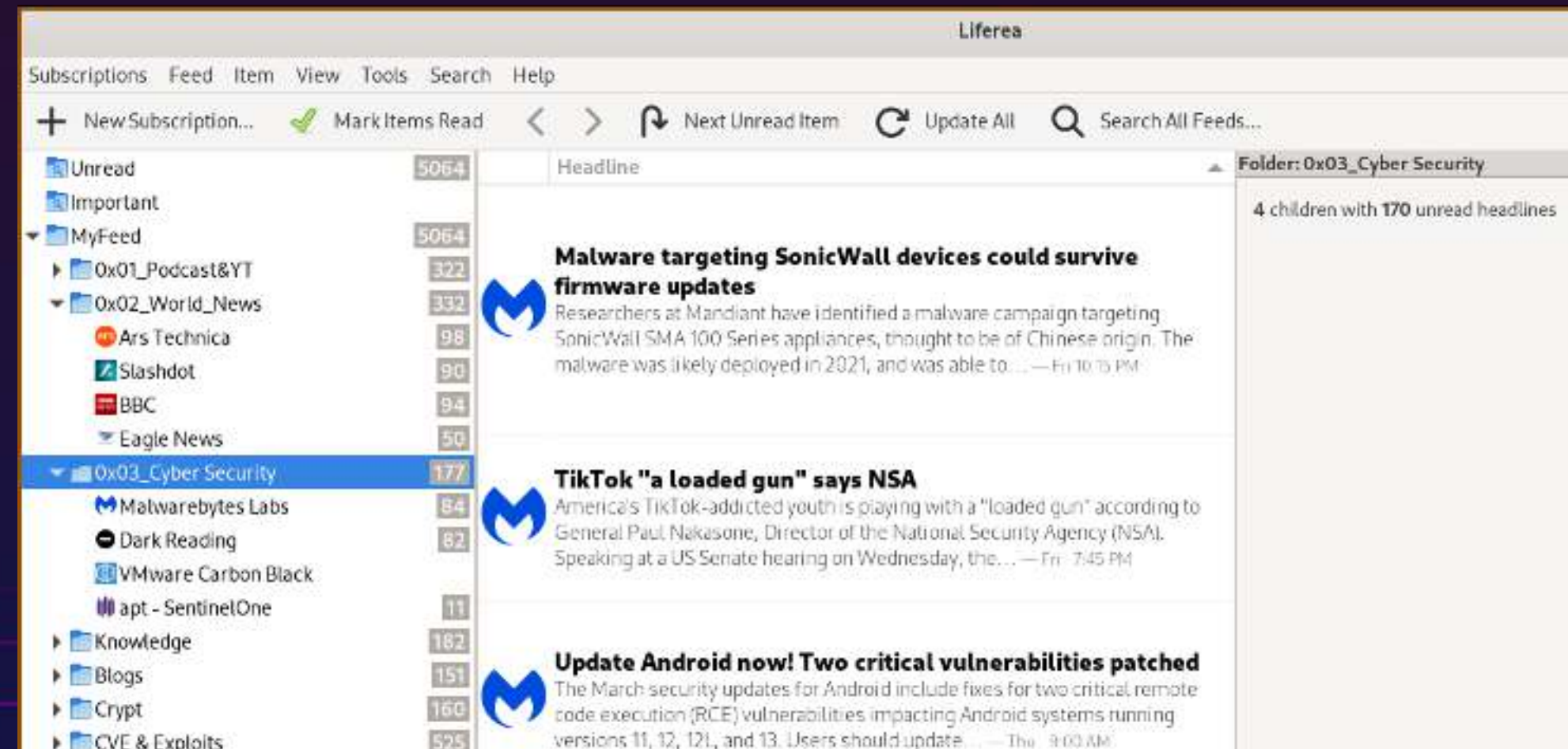
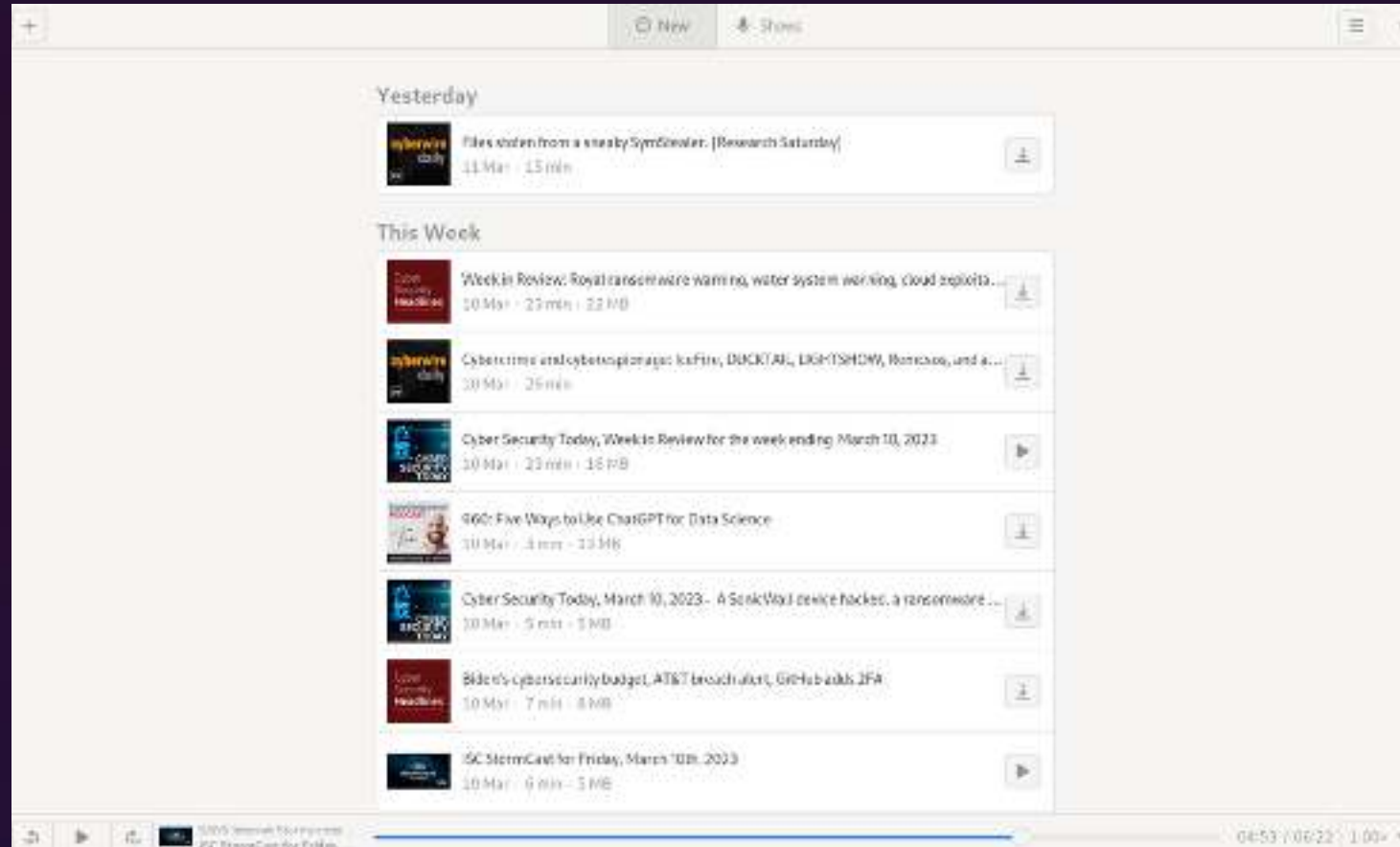
### InfoSec Communities

Communities are typically focused on helping people learn about security, providing a platform for security professionals to network and collaborate, or sharing the latest security news and developments.



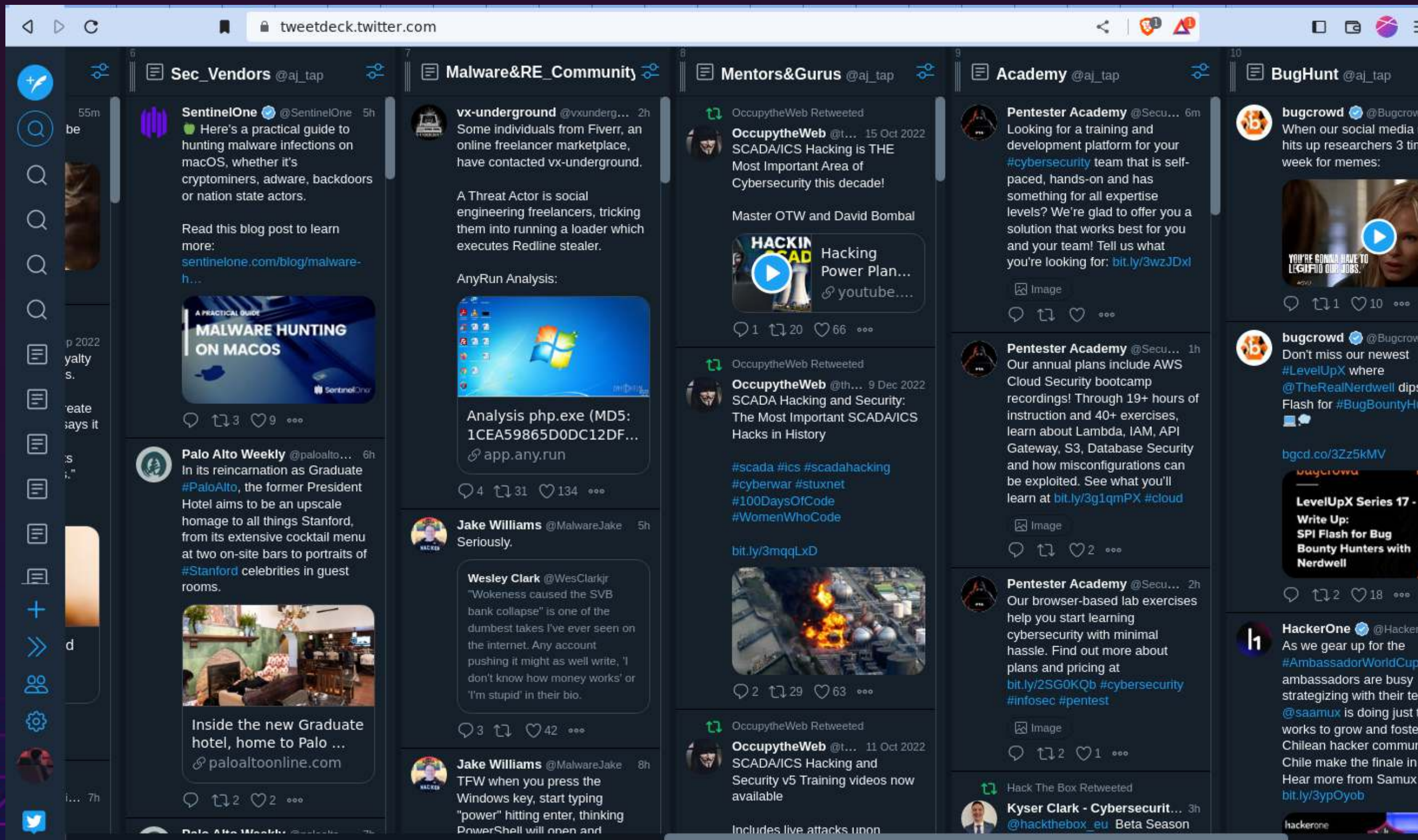
# HOW TO STAY UPDATED

RSS feeds are a great way to stay updated on the latest content from websites you follow without having to visit each website individually





# HOW TO STAY UPDATED



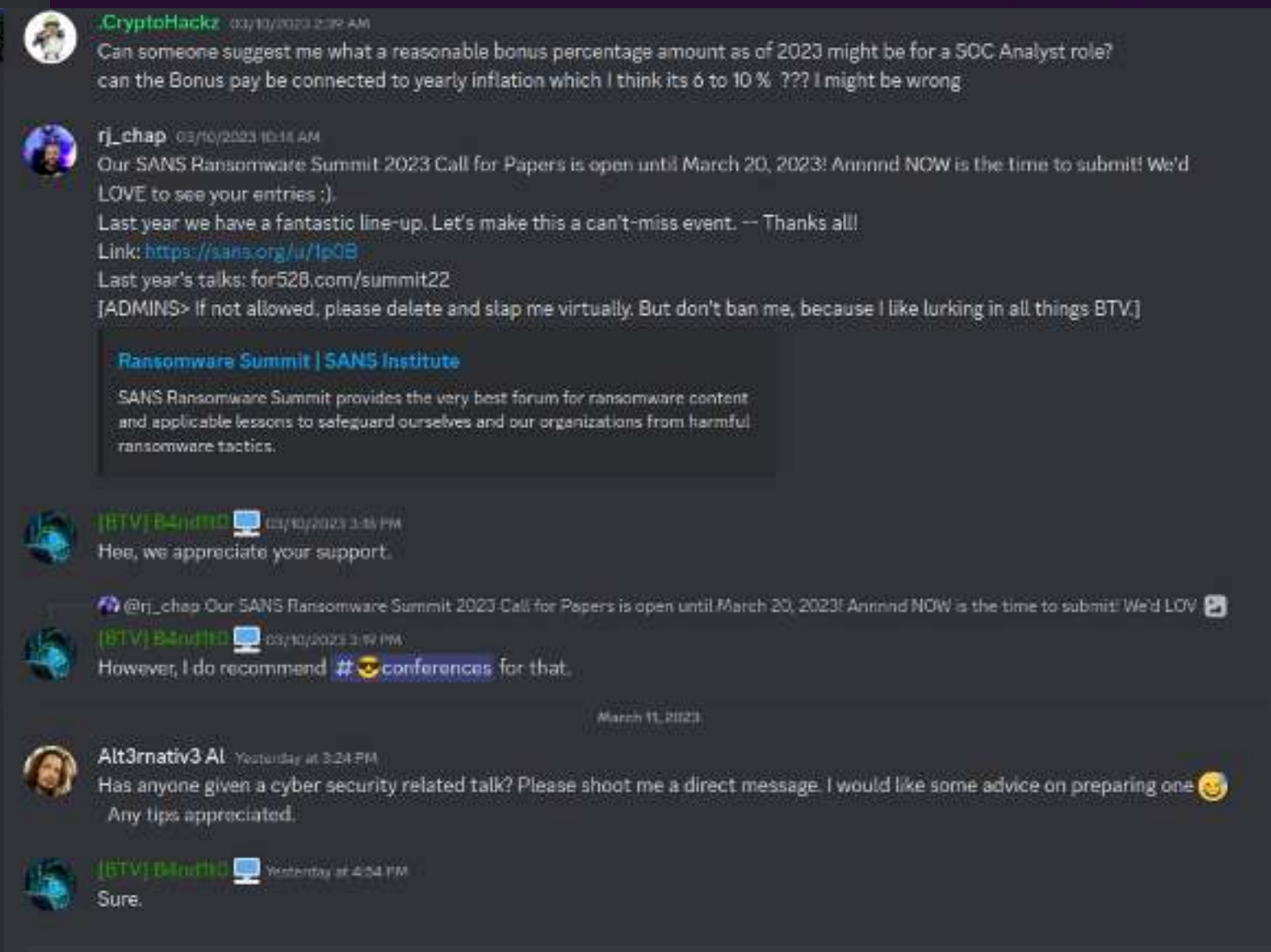
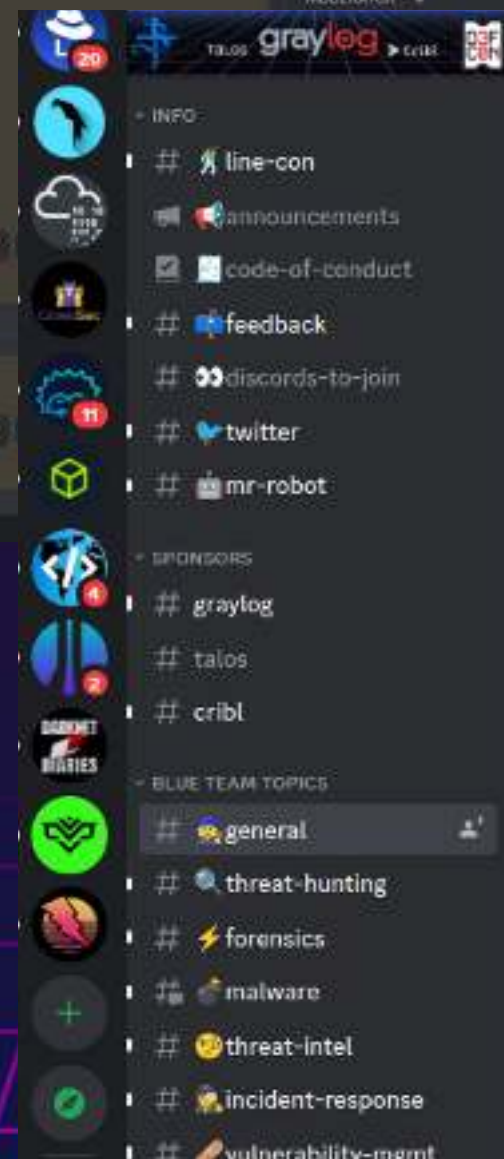
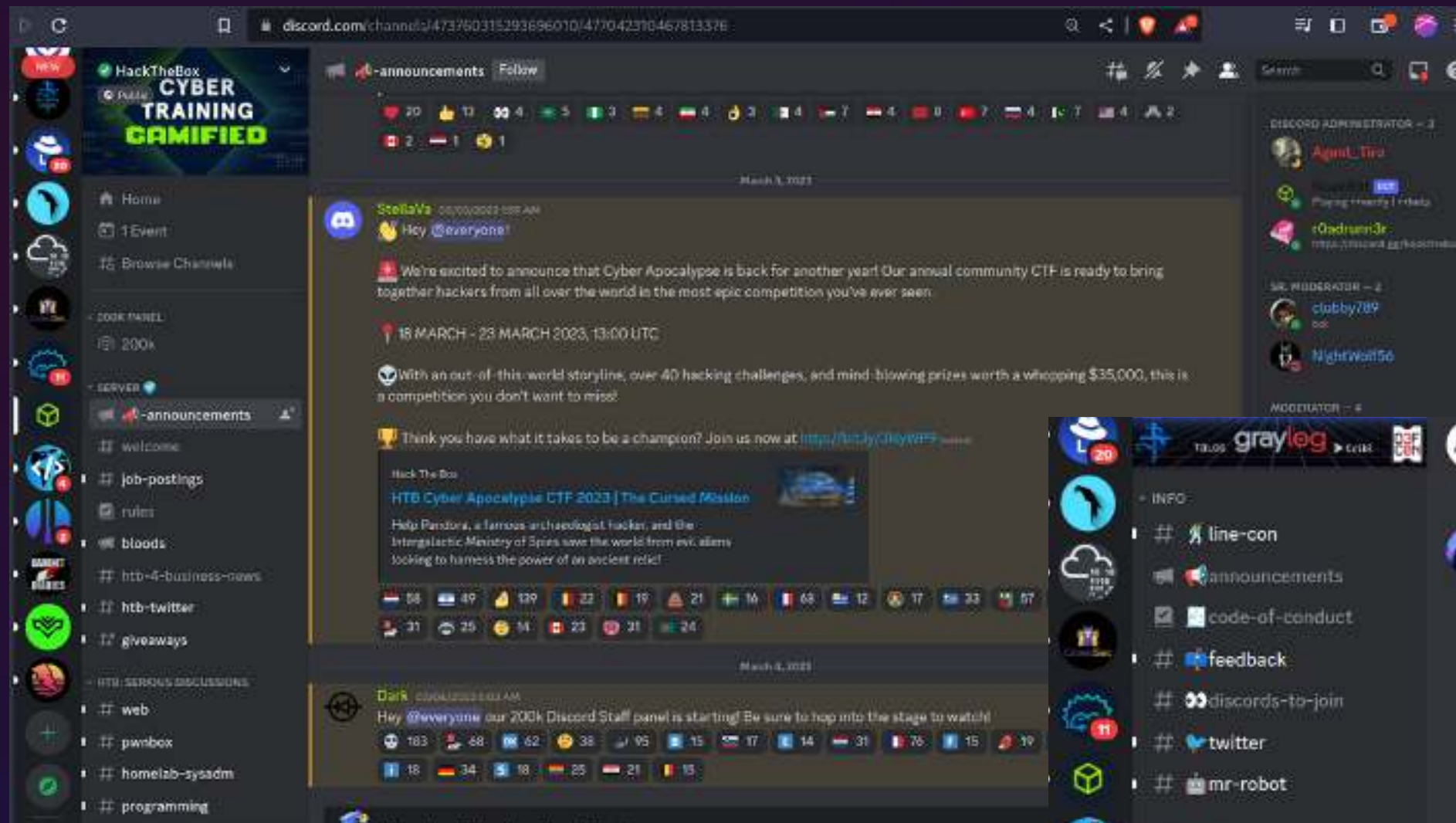
social media dashboard  
application that  
allows users to manage  
and organize  
their Twitter accounts.



# HOW TO STAY UPDATED



several communities dedicated to  
information security (InfoSec).  
Network with people :)





# HOW TO RETAIN LEARNINGS



## Zettelkasten

note-taking method that involves creating small, interconnected notes or "slips" that can be linked together to form a knowledge graph.



## Note-taking apps

Such as Obsidian, Notion, Evernote, TiddlyWiki and Roam Research



## Spaced Repetition

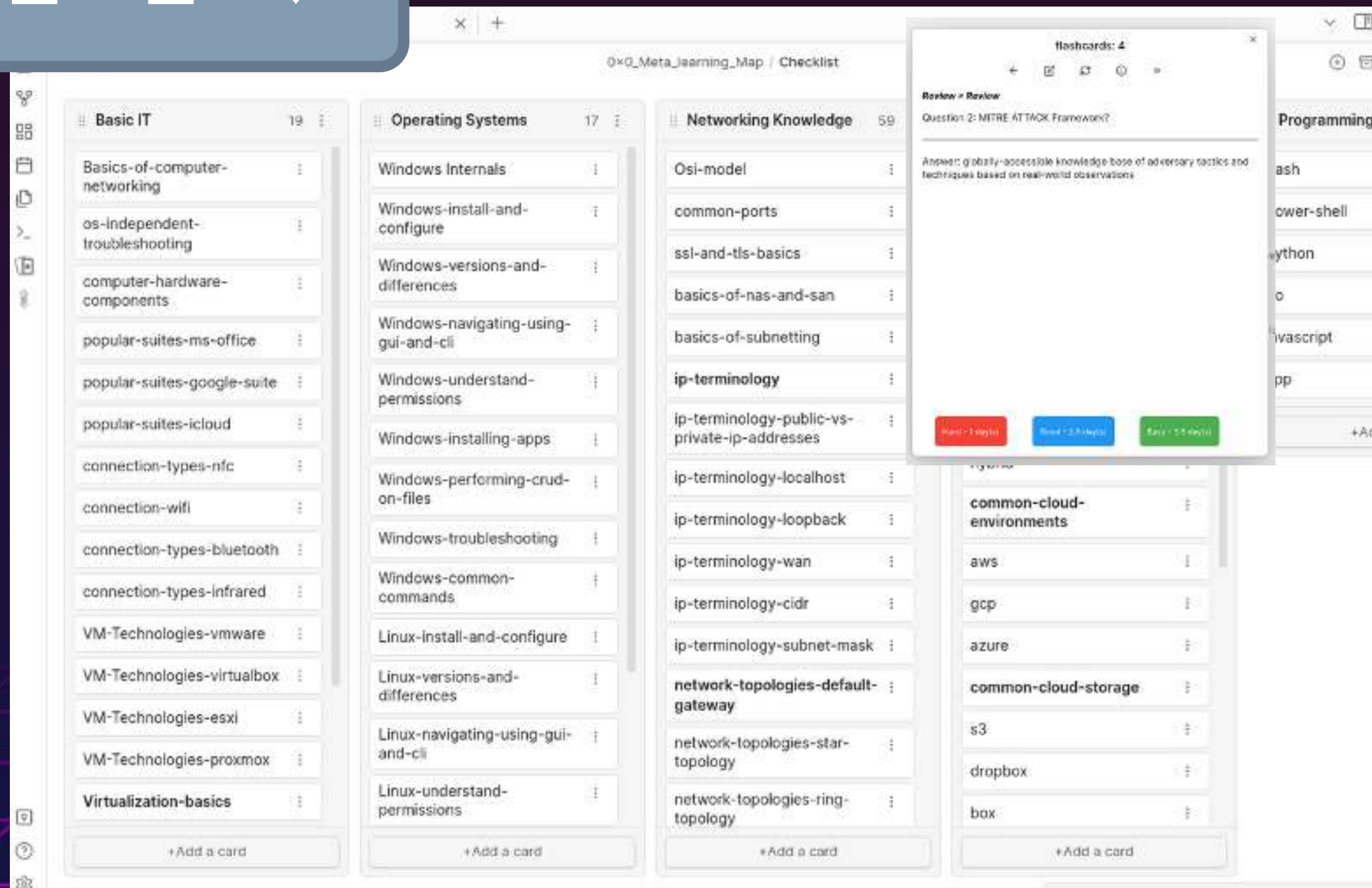
learning technique that uses flashcards to help you remember and recall information. which involves repeating information at increasingly spaced intervals to improve memory retention.

# YOUR ROADMAP TEMPLATE



## Ultra learning MD notebook template

- Contains plugins and templates that can help you retain your learning



Notebook template:

<https://drive.google.com/file/d/1xNAuePD9SM7mwrnMdRDeIgnbWy6msbcy/view?usp=sharing>

RSS feedlist:

[https://drive.google.com/file/d/1YJgF3mjue0juiRr6uJLqNBE3sUvwUFLF/view?usp=share\\_link](https://drive.google.com/file/d/1YJgF3mjue0juiRr6uJLqNBE3sUvwUFLF/view?usp=share_link)

How to use it.

1. Download the obsidian note taking app  
a. <https://obsidian.md>
2. Download and extract the template
3. Open as vault and specify the template directory

Tutorial in setting up your own:

<https://www.youtube.com/watch?v=E6ySG7xYgjY>



THANK YOU FOR LISTENING



## GuideM Training Center

Cybersecurity live training courses such as Cyber Defense, Threat Hunting, Digital Forensics, Memory Analysis and some <https://www.facebook.com/guidemtraining>



## Association of Computer Science Student

ACSS Be part of our team we will conduct CTF competitions, hackthons and webinars.

