# ENRICHING HONEYPOT DATA USING CYBER THREAT INTELLIGENCE

Cybersecurity is a rapidly growing field that becomes more complex as time goes on. There are numerous aspects of security that branch out into their own equally complex fields. Many companies and organizations struggle to properly prepare for attacks against them, and fail to utilize threat intelligence or offensive security measures to mitigate these attacks.


## AUTHORS

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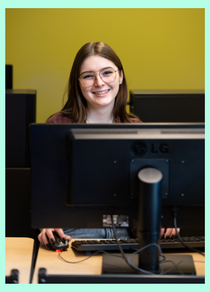


## AFFILIATIONS

Presented to the faculty of the Information Technology & Sciences Academic Division at Champlain College for the Bachelor's of Science, Computer Networking & Cybersecurity and Bachelor's of Science, Computer & Digital Forensics

Under the Supervision of Dr. Ali Hadi and Dr. Elizabeth Allen-Pennebaker


## Introduction

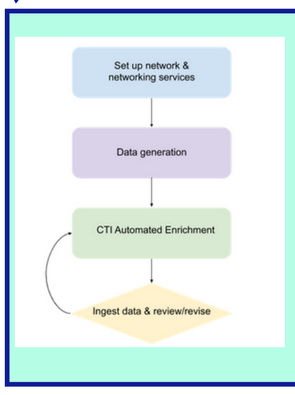
This project aims to take data gathered by honeypots to enrich reports that can be provided to cybersecurity experts to improve their security posture. While honeypots and threat intelligence are properly established in the field and have copious research behind their workings and capabilities, the knowledge around applying them to a readable format is limited. This research aims to bridge that gap between threat intelligence and security hardening. The project will be accomplished by creating a virtual network that emulates an enterprise network. Offensive security mechanisms will be installed on these machines in the appropriate sections to produce the results needed for enriching reports.

## Objective

The main objectives of this work can be summarized as the following:

- Setup, configuration, and deployment of honeypots on a virtual network
- Monitoring networks for intrusion detection and appropriately responding to these threats
- Collection of data to utilize in a report scheme that can be sent to cybersecurity experts to mitigate future threats

## Methodology

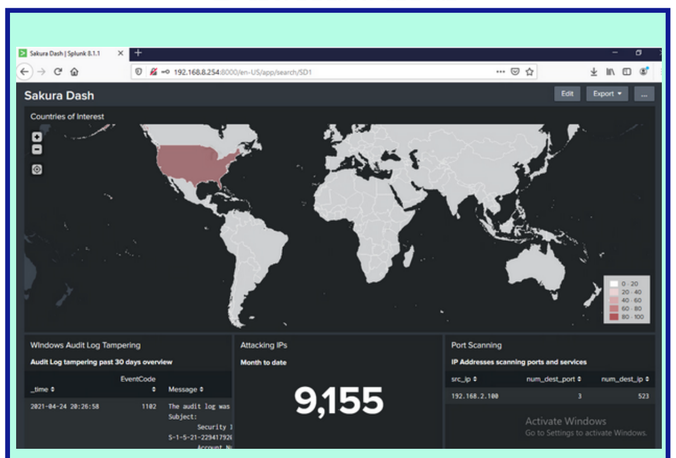


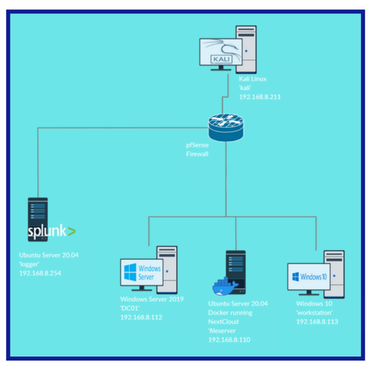

- Kali_Linux
- pfSense
- ubuntu-linux
- UbuntuSrv_20.04
- Windows-10
- Windows10_new
- WindowsServer

## Results

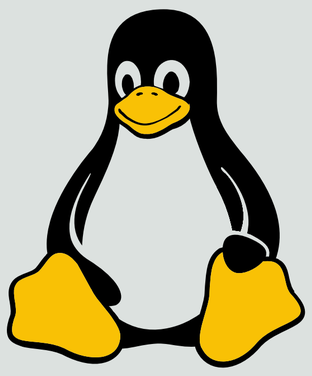
Our intelligence dashboard, Sakura Dash, shows malicious activity such as port scanning, distinct attacking IPs, countries of origin, Windows audit log tampering, and Linux shutdowns. We were able to see how many IP addresses were used to target the honeypot, where the IP addresses were originating from, as well as have an overview of what the attacker was doing in a broad overview. With this broad overview, we were able to investigate their interests in our web app and environment.

## Results Dashboard

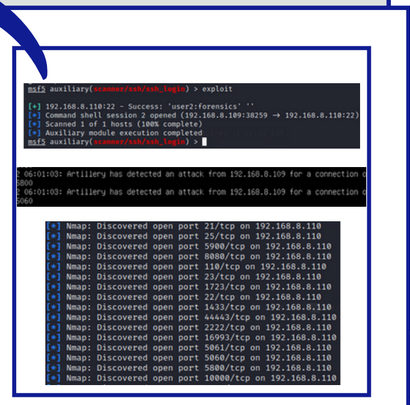



Network map of honeypot environment




SPL queries for dashboard searches




Screen captures from Kali Linux on the offensive side during emulated attacks and Artillery honeypot and IDS

## Conclusion

Overall, the project found that dashboards are the best way to visualize and present Threat Intelligence data to cybersecurity experts. Dashboards are a great way to visualize key metrics, and it makes the data easier to present both to cybersecurity experts, and those who may not have as much knowledge in the field. These dashboards are highly customizable, and can suit the security needs of any organization and display relevant data and fields.
The project also found that honeypots were a vital resource in detecting and identifying weak points in a network. They were a massive asset during the simulated attacks to find these threats, and can be a huge asset to an organization that wants to utilize these technologies. The honeypots were also helpful in preventing reconnaissance on the network, as the ports and IPs that were "opened" by the honeypots helped obscure finer details on the network.

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