Alpha Presentation
Hybrid Cyberattack Simulator
The Capstone Experience
Team Vectra AI
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Spring 2024
Project Overview

• Vectra’s AI models need relevant training data to maintain effectiveness
• Adding 3 new network protocols and advanced C2 configuration such as beaconless interaction and dynamic responses
• Also adding hybrid integration with third-party attack tools
System Architecture

The Capstone Experience

Team Vectra AI Alpha Presentation
Project Risks

• Compatibility
  ▪ Make sure all third-party apps work together
  ▪ Using active libraries and using version control

• Generating Realistic Data
  ▪ Generate realistic enough data for AI models to train on
  ▪ Analyzing real world attacks and mimicking their outputs

• Performance Issues
  ▪ Make large amounts of data in reasonable amounts of time
  ▪ Spending time optimizing code; looking at distributed computing

• Portability
  ▪ The program needs to be able to run on multiple OS without issue
  ▪ Using cross-platform libraries and allowing API calls to server to abstract user operating system
Realistic Data versus Ours
Result of 24 Hour Job
Configuring a WebSocket Job

![WebSocket Job Configuration](image)

- **Simulation Properties**
  - Simulation Name: `test`
  - Log job output to file
  - **Protocol**: TCP, HTTP, HTTPS, UDP, WebSocket, HTTP/2, HTTP/3
  - **Server Listening Port**: 9000
  - **Beacon time**: 3 seconds
  - **Jitter**: 1 second
  - **Padding Type**: Flat, Random
  - **Connection Profile**: Long, Short
  - **Number of Tunnels**: 1
  - **Tunnel 1 Termination Time**: 10 seconds

- **Playbook**
  - **Add Command**
    - **Job Type**: Portscan, Arbitrary Command, MAAD Job
    - **Content**:
      - Portscan: `powershell.exe ping 8.8.8.8`
      - Arbitrary Command: `powershell.exe / MAAD_Attack.ps1`
    - **Delay**: 3, 0
    - **Actions**: Delete

- **Buttons**:
  - Create Simulation
  - Cancel
The Client Terminal in Action

```json

{'status': 'success'}
Job Result Successfully Sent to Server

Handling job Exfiltrate Data
Sending job response to server for job Exfiltrate Data
Connection is present
Connection<ConnectionKey(host='127.0.0.1', port=9000, is_ssl=False, ssl=None, proxy=None, proxy_auth=None, proxy_headers_hash=None)>
<ClientResponse(http://127.0.0.1:9000/job_result) [200 OK]>
< CIMultiDictProxy('Content-Type': 'application/json; charset=utf-8', 'Content-Length': '21', 'Date': 'Tue, 20 Feb 2024 00:46:04 GMT', 'Server': 'Python/3.12 aiohttp/3.9.1')>
Local address: 127.0.0.1, Local port: 63557
Beacon sent
{'status': 'success'}
Job Result Successfully Sent to Server

Handling job Encrypt File System
Sending job response to server for job Encrypt File System
Connection is present
Connection<ConnectionKey(host='127.0.0.1', port=9000, is_ssl=False, ssl=None, proxy=None, proxy_auth=None, proxy_headers_hash=None)>
<ClientResponse(http://127.0.0.1:9000/job_result) [200 OK]>
< CIMultiDictProxy('Content-Type': 'application/json; charset=utf-8', 'Content-Length': '21', 'Date': 'Tue, 20 Feb 2024 00:46:05 GMT', 'Server': 'Python/3.12 aiohttp/3.9.1')>
Local address: 127.0.0.1, Local port: 63557
Beacon sent
{'status': 'success'}
Job Result Successfully Sent to Server

Handling job Arbitrary Command
Files found, no need to download
b'\n'n'
b'Ping 8.8.8.8 with 32 bytes of data:\n' b'\n' b'Reply from 8.8.8.8: bytes=32 time=14ms TTL=55\n' b'Reply from 8.8.8.8: bytes=32 time=14ms TTL=55\n' b'Reply from 8.8.8.8: bytes=32 time=14ms TTL=55\n' b'Reply from 8.8.8.8: bytes=32 time=14ms TTL=55\n' b'\n' b'Ping statistics for 8.8.8.8:\n' b' Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),\n' b'Approximate round trip times in milli-seconds:\n' b' Minimum = 14ms, Maximum = 15ms, Average = 14ms\n' n'

Sending job response to server for job Arbitrary Command
Connection is present
Connection<ConnectionKey(host='127.0.0.1', port=9000, is_ssl=False, ssl=None, proxy=None, proxy_auth=None, proxy_headers_hash=None)>
<ClientResponse(http://127.0.0.1:9000/job_result) [200 OK]>
```
What’s left to do?

• Webshells
• REST API
• Malleable Profile
• HTTP/3
• Graph Job Start Times on Web UI
Questions?