Practical Activity – Scanning Exercise

Brief

Perform scans against your assigned website using the tools available in **Kali Linux**. Answer as many of the following questions as you can:

- What Operating System does the web site utilise?
- What web server software is it running?
- Is it running a CMS (Wordpress, Drupal, etc?)
- What protection does it have (CDN, Proxy, Firewall?)
- Where is it hosted?
- Does it have any open ports?
- Does the site have any known vulnerabilities?
- What versions of software is it using? Are these patched so that they are up to date?

The following results were conducted against www.staffmatters.co.uk.

Results

What Operating System does the web site utilise?

- I used **nmap -O -sV** to scan for OS guesses:

```
PORT           STATE          SERVICE
21/tcp         open           ftp
25/tcp         open           smtp
53/tcp         open           domain
80/tcp         open           http
110/tcp        open           pop3
143/tcp        open           imap
443/tcp        open           https
465/tcp        open           smtps
587/tcp        open           submission
993/tcp        open           imaps
995/tcp        open           pop3s
2525/tcp       open           ms-v-worlds
3306/tcp       open           mysql
5432/tcp       open           postgresql
```

```
Aggressive OS guesses:
```

- `Oracle Virtualbox (96%),`
- `QEMU user mode network gateway (93%),`
- `Kodak ESP C310 printer (93%),`
- `Kodak ESP 5250 printer (92%),`
- `Kodak ESP 5210 printer (92%),`
- `ADSL router: Huawei MT800u-T; or ZyXEL Prestige 623ME-T1, 643, 662HW-61, 782, or 2602R-61 (92%),`

- Huawei Echolife HG520-series ADSL modem (92%),
- Telewell TW-EA501 ADSL modem (92%),
- TP-LINK TD-W8951ND wireless ADSL modem (92%),
- ZyXEL P-2602HW-D1A wireless DSL modem (ZyNOS 3.40) (92%)

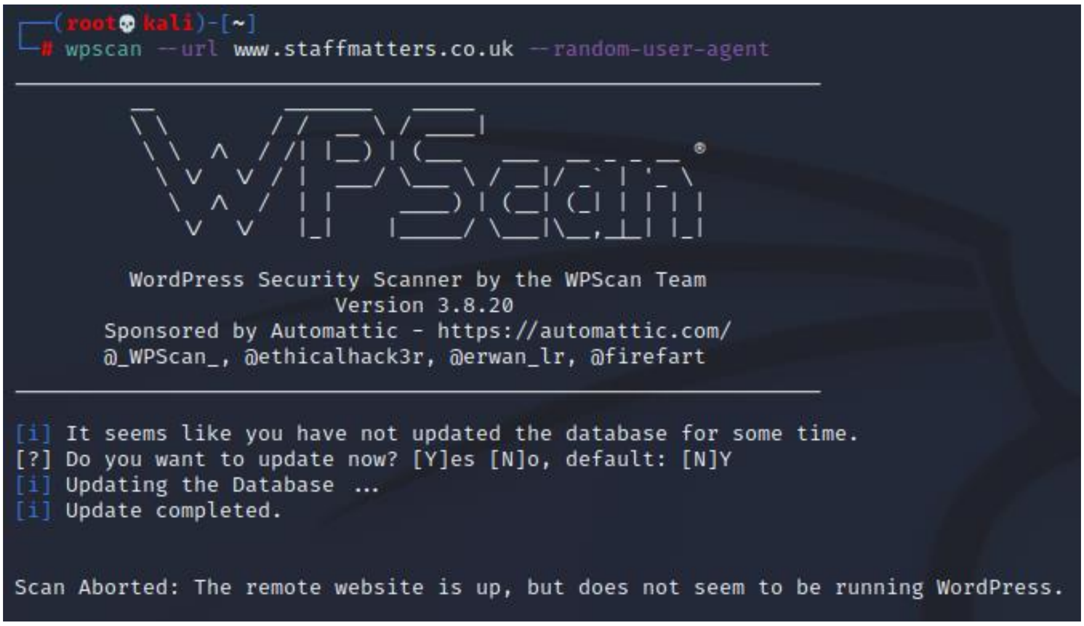
```
No exact OS matches for host (test conditions non-ideal).
```

What web server software is it running?

```
PORT           STATE          SERVICE        VERSION
21/tcp         open           ftp            Pure-FTPd
25/tcp         open           smtp?
53/tcp         open           tcpwrapped
80/tcp         open           tcpwrapped
110/tcp        open           tcpwrapped
143/tcp        open           imap           Dovecot imapd
443/tcp        open           ssl/http       Apache httpd (W3 Total Cache/0.9.4.6.4)
465/tcp        open           ssl/smtps?
993/tcp        open           ssl/imaps?
995/tcp        open           ssl/pop3       Dovecot pop3d
2525/tcp       open           tcpwrapped
3306/tcp       open           tcpwrapped
5432/tcp       open           postgresql     PostgreSQL DB 9.6.0 or later

1 service unrecognized despite returning data. If you know the service/version, please
submit the following fingerprint at
https://nmap.org/cgi-bin/submit.cgi?new-service:SF-Port5432-
TCP:V=7.92%I=7%D=1/13%Time=61E0BC70%P=x86_64-pc-linux-
gnu%r(SMSF:BProgNeg,8C,"E\0\0\0\x8bSFATAL\0VFATAL\0C0A000\0Munsupported\x20fronten
SF:d\x20protocol\x2065363\.19778:\x20server\x20supports\x201\.0\x20to\x203SF:\.0\0Fpo
stmaster\.c\0L2050\0RProcessStartupPacket\0\0");
```

Is it running a CMS (Wordpress, Drupal, etc?)

- I used the tool **wpscan –url –random-user-agent**

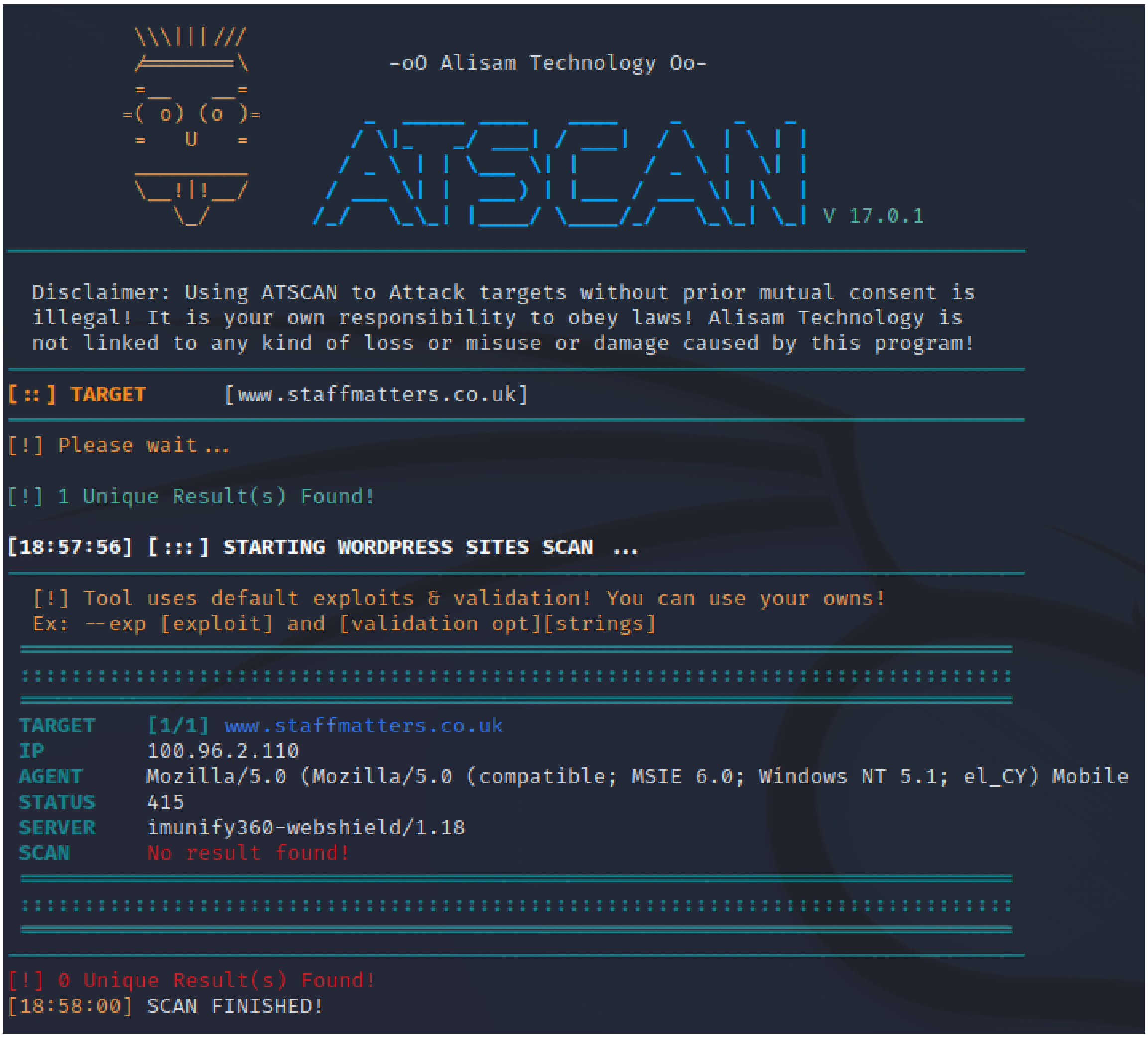


```
┌──(root💀kali)-[~]
└─# wpscan --url www.staffmatters.co.uk --random-user-agent
_______________________________________________________________
         __          _______   _____
         \ \        / /  __ \ / ____|
          \ \  /\  / /| |__) | (___   ___  __ _ _ __ ®
           \ \/  \/ / |  ___/ \___ \ / __|/ _` | '_ \
            \  /\  /  | |     ____) | (__| (_| | | | |
             \/  \/   |_|    |_____/ \___|\__,_|_| |_|

         WordPress Security Scanner by the WPScan Team
                         Version 3.8.20
       Sponsored by Automattic - https://automattic.com/
       @_WPScan_, @ethicalhack3r, @erwan_lr, @firefart
_______________________________________________________________

[i] It seems like you have not updated the database for some time.
[?] Do you want to update now? [Y]es [N]o, default: [N]Y
[i] Updating the Database ...
[i] Update completed.


Scan Aborted: The remote website is up, but does not seem to be running WordPress.
```

- I used the tool **killshot** (https://www.geeksforgeeks.org/killshot-information-gathering-tool-in-kali-linux/) and selected the option “{1} Web Technologies”

```
Basic WhatWeb Information :: http://staffmatters.co.uk [200 OK]
Bootstrap[3.3.6,3.3.7],
Cookies[cl-bypass-cache],
Country[UNITED STATES][US],
HTML5,
HTTPServer[imunify360-webshield/1.18],
HttpOnly[cl-bypass-cache],
IP[68.66.247.187],
JQuery[1.12.4],
PoweredBy[Imunify360],
Script,
Title[Captcha],
UncommonHeaders[cf-edge-cache]

[+]Host Result :: staffmatters.co.uk has address 68.66.247.187
staffmatters.co.uk mail is handled by 0 mail.staffmatters.co.uk.

(output removed for brevity…)

[+] The site https://staffmatters.co.uk is behind Imunify360 (CloudLinux) WAF.
```

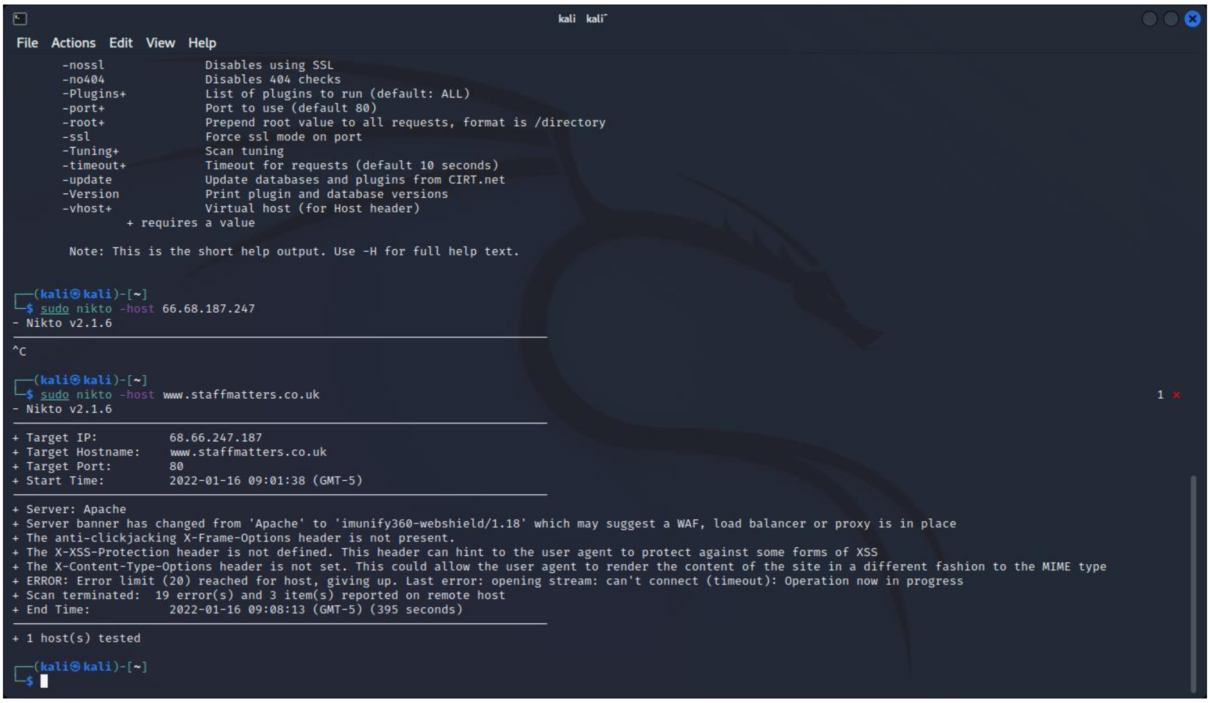
- I used the too **atscan** but no useful results were obtained



```
                    -oO Alisam Technology Oo-

                                                      V 17.0.1

  Disclaimer: Using ATSCAN to Attack targets without prior mutual consent is
  illegal! It is your own responsibility to obey laws! Alisam Technology is
  not linked to any kind of loss or misuse or damage caused by this program!

[ :: ] TARGET      [www.staffmatters.co.uk]

[!] Please wait ...

[!] 1 Unique Result(s) Found!

[18:57:56] [ ::: ] STARTING WORDPRESS SITES SCAN  ...

  [!] Tool uses default exploits & validation! You can use your owns!
  Ex: --exp [exploit] and [validation opt][strings]

 ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::

 TARGET     [1/1] www.staffmatters.co.uk
 IP         100.96.2.110
 AGENT      Mozilla/5.0 (Mozilla/5.0 (compatible; MSIE 6.0; Windows NT 5.1; el_CY) Mobile
 STATUS     415
 SERVER     imunify360-webshield/1.18
 SCAN       No result found!

 ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::

[!] 0 Unique Result(s) Found!
[18:58:00] SCAN FINISHED!
```

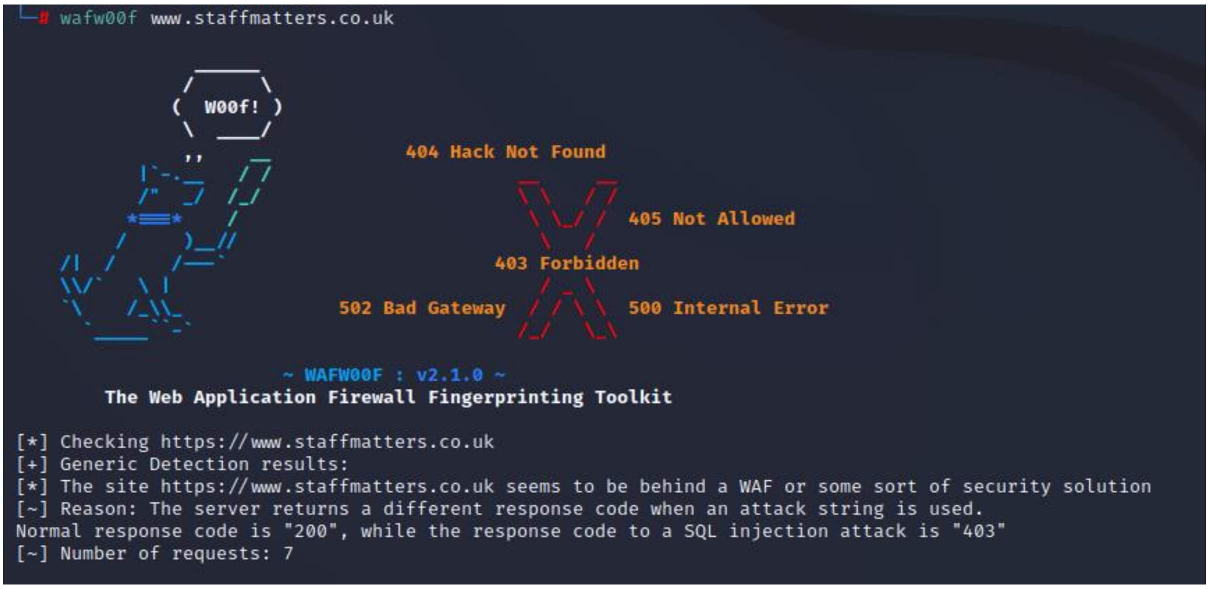
What protection does it have (CDN, Proxy, Firewall?)

- I used the tool **nikto**



```
       -nossl              Disables using SSL
       -no404              Disables 404 checks
       -Plugins+           List of plugins to run (default: ALL)
       -port+              Port to use (default 80)
       -root+              Prepend root value to all requests, format is /directory
       -ssl                Force ssl mode on port
       -Tuning+            Scan tuning
       -timeout+           Timeout for requests (default 10 seconds)
       -update             Update databases and plugins from CIRT.net
       -Version            Print plugin and database versions
       -vhost+             Virtual host (for Host header)
                + requires a value

        Note: This is the short help output. Use -H for full help text.

┌──(kali㉿kali)-[~]
└─$ sudo nikto -host 66.68.187.247
- Nikto v2.1.6
---------------------------------------------------------------------------
^C

┌──(kali㉿kali)-[~]
└─$ sudo nikto -host www.staffmatters.co.uk                                                    1 ×
- Nikto v2.1.6
---------------------------------------------------------------------------
+ Target IP:          68.66.247.187
+ Target Hostname:    www.staffmatters.co.uk
+ Target Port:        80
+ Start Time:         2022-01-16 09:01:38 (GMT-5)
---------------------------------------------------------------------------
+ Server: Apache
+ Server banner has changed from 'Apache' to 'imunify360-webshield/1.18' which may suggest a WAF, load balancer or proxy is in place
+ The anti-clickjacking X-Frame-Options header is not present.
+ The X-XSS-Protection header is not defined. This header can hint to the user agent to protect against some forms of XSS
+ The X-Content-Type-Options header is not set. This could allow the user agent to render the content of the site in a different fashion to the MIME type
+ ERROR: Error limit (20) reached for host, giving up. Last error: opening stream: can't connect (timeout): Operation now in progress
+ Scan terminated:  19 error(s) and 3 item(s) reported on remote host
+ End Time:           2022-01-16 09:08:13 (GMT-5) (395 seconds)
---------------------------------------------------------------------------
+ 1 host(s) tested

┌──(kali㉿kali)-[~]
└─$ 
```

- I used the tool **wafW00f**

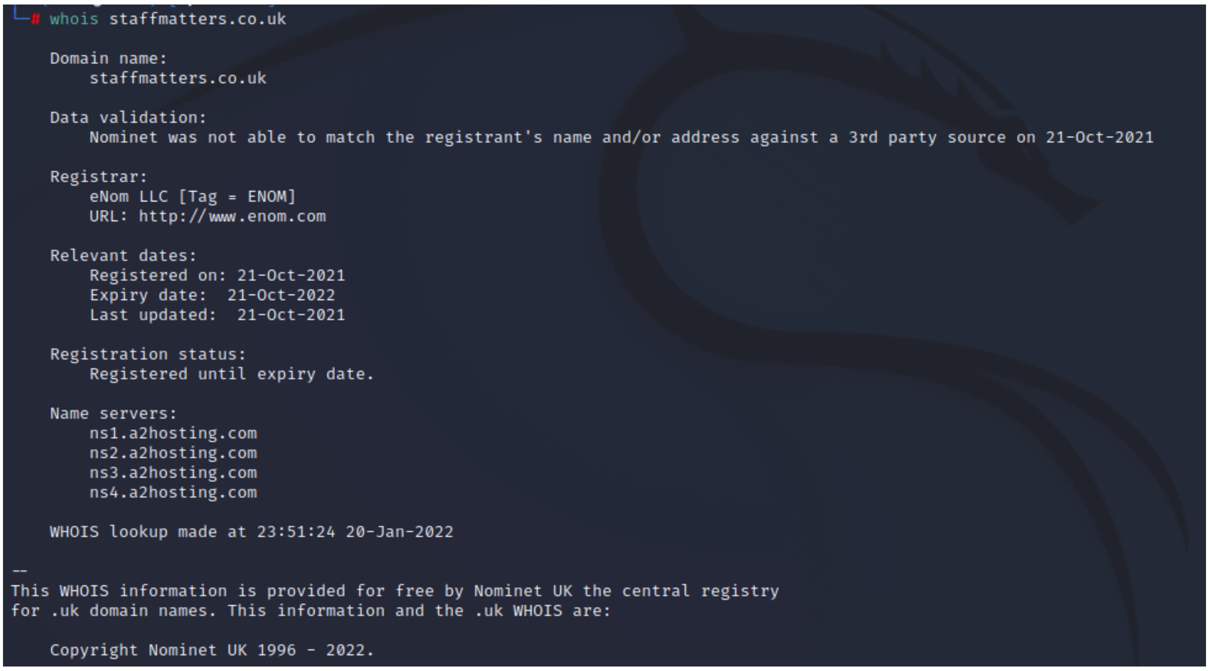


```
└─# wafw00f www.staffmatters.co.uk

                                          404 Hack Not Found

                                                        405 Not Allowed

                                                 403 Forbidden

                                     502 Bad Gateway          500 Internal Error

                            ~ WAFW00F : v2.1.0 ~
              The Web Application Firewall Fingerprinting Toolkit

[*] Checking https://www.staffmatters.co.uk
[+] Generic Detection results:
[*] The site https://www.staffmatters.co.uk seems to be behind a WAF or some sort of security solution
[~] Reason: The server returns a different response code when an attack string is used.
Normal response code is "200", while the response code to a SQL injection attack is "403"
[~] Number of requests: 7
```

The site is potentially hosted behind a Web Application Firewall, but the tool could not correctly identify it.

Where is it hosted?

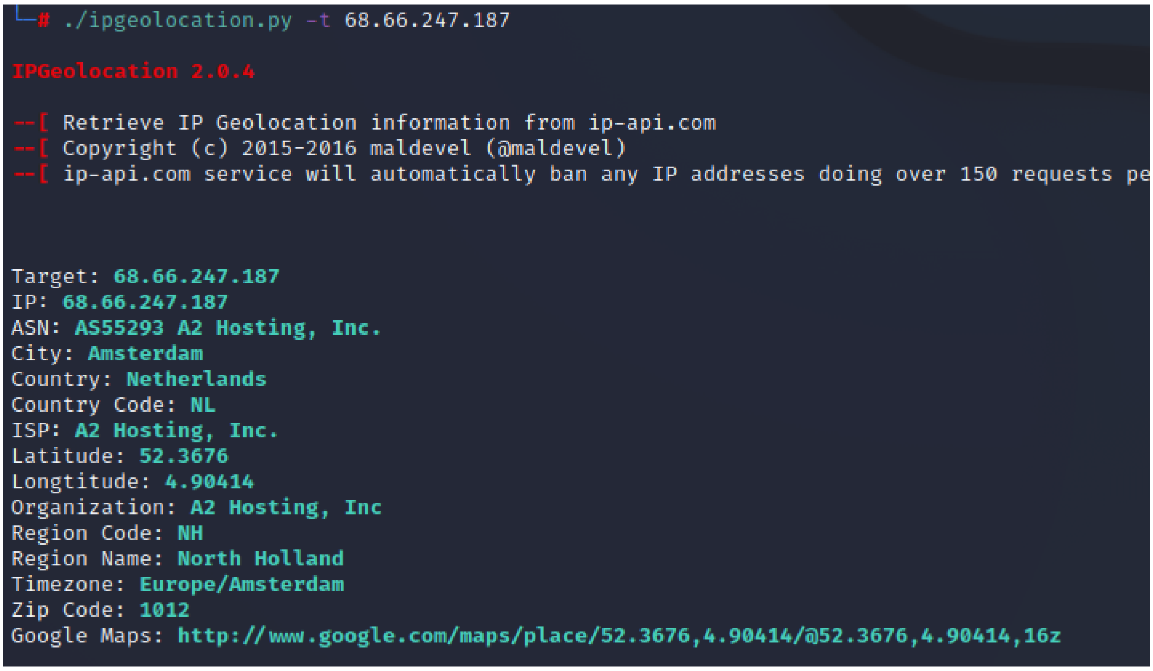
- I used the tool **WHOIS**



```
└─# whois staffmatters.co.uk

    Domain name:
        staffmatters.co.uk

    Data validation:
        Nominet was not able to match the registrant's name and/or address against a 3rd party source on 21-Oct-2021

    Registrar:
        eNom LLC [Tag = ENOM]
        URL: http://www.enom.com

    Relevant dates:
        Registered on: 21-Oct-2021
        Expiry date:  21-Oct-2022
        Last updated:  21-Oct-2021

    Registration status:
        Registered until expiry date.

    Name servers:
        ns1.a2hosting.com
        ns2.a2hosting.com
        ns3.a2hosting.com
        ns4.a2hosting.com

    WHOIS lookup made at 23:51:24 20-Jan-2022

--
This WHOIS information is provided for free by Nominet UK the central registry
for .uk domain names. This information and the .uk WHOIS are:

    Copyright Nominet UK 1996 - 2022.
```

Nominet hold registration data for the hosted site but does not show the hosting location.

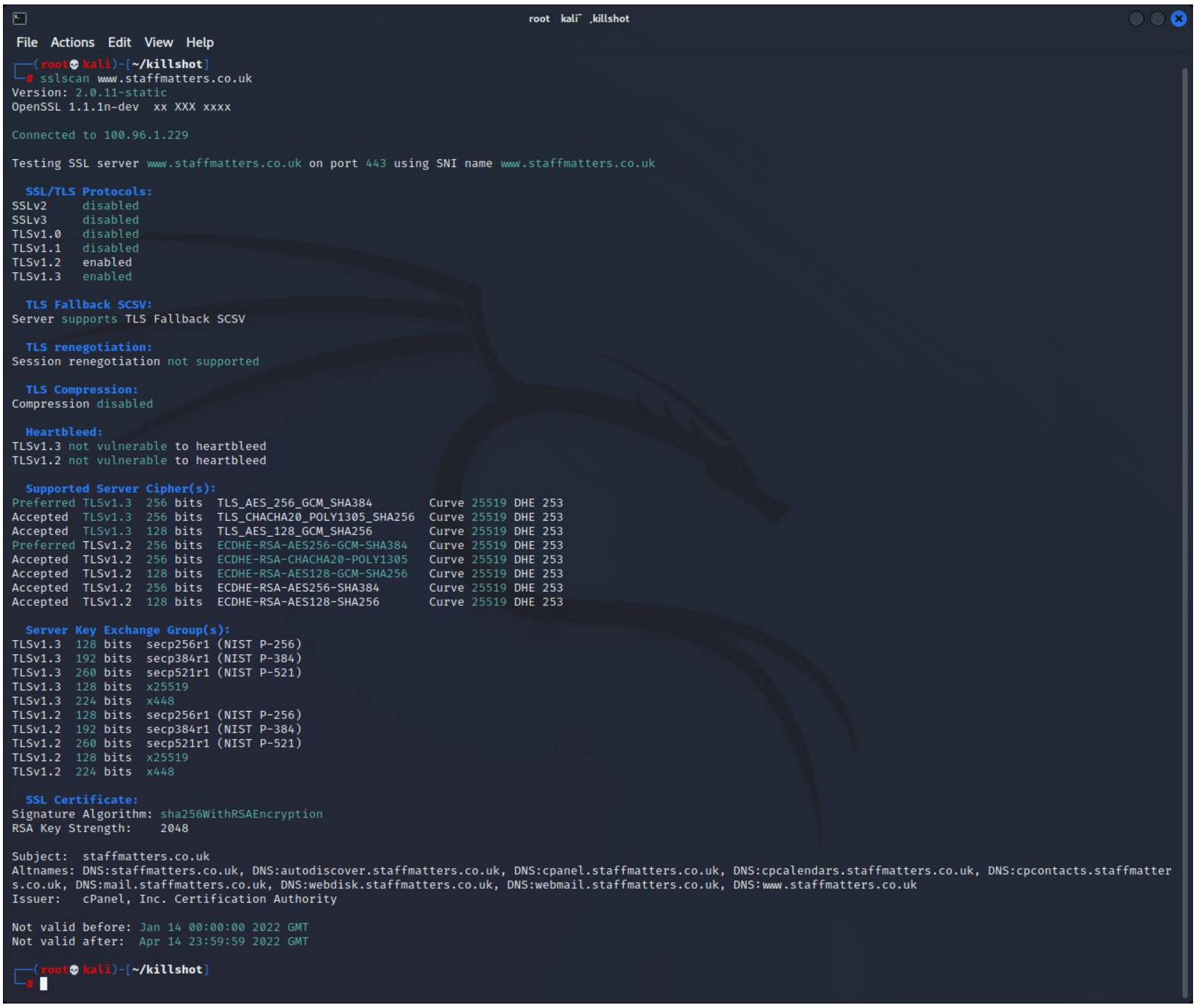
- I used the tool **IPGeolocation**



```
└─# ./ipgeolocation.py -t 68.66.247.187

IPGeolocation 2.0.4

--[ Retrieve IP Geolocation information from ip-api.com
--[ Copyright (c) 2015-2016 maldevel (@maldevel)
--[ ip-api.com service will automatically ban any IP addresses doing over 150 requests pe


Target: 68.66.247.187
IP: 68.66.247.187
ASN: AS55293 A2 Hosting, Inc.
City: Amsterdam
Country: Netherlands
Country Code: NL
ISP: A2 Hosting, Inc.
Latitude: 52.3676
Longtitude: 4.90414
Organization: A2 Hosting, Inc
Region Code: NH
Region Name: North Holland
Timezone: Europe/Amsterdam
Zip Code: 1012
Google Maps: http://www.google.com/maps/place/52.3676,4.90414/@52.3676,4.90414,16z
```

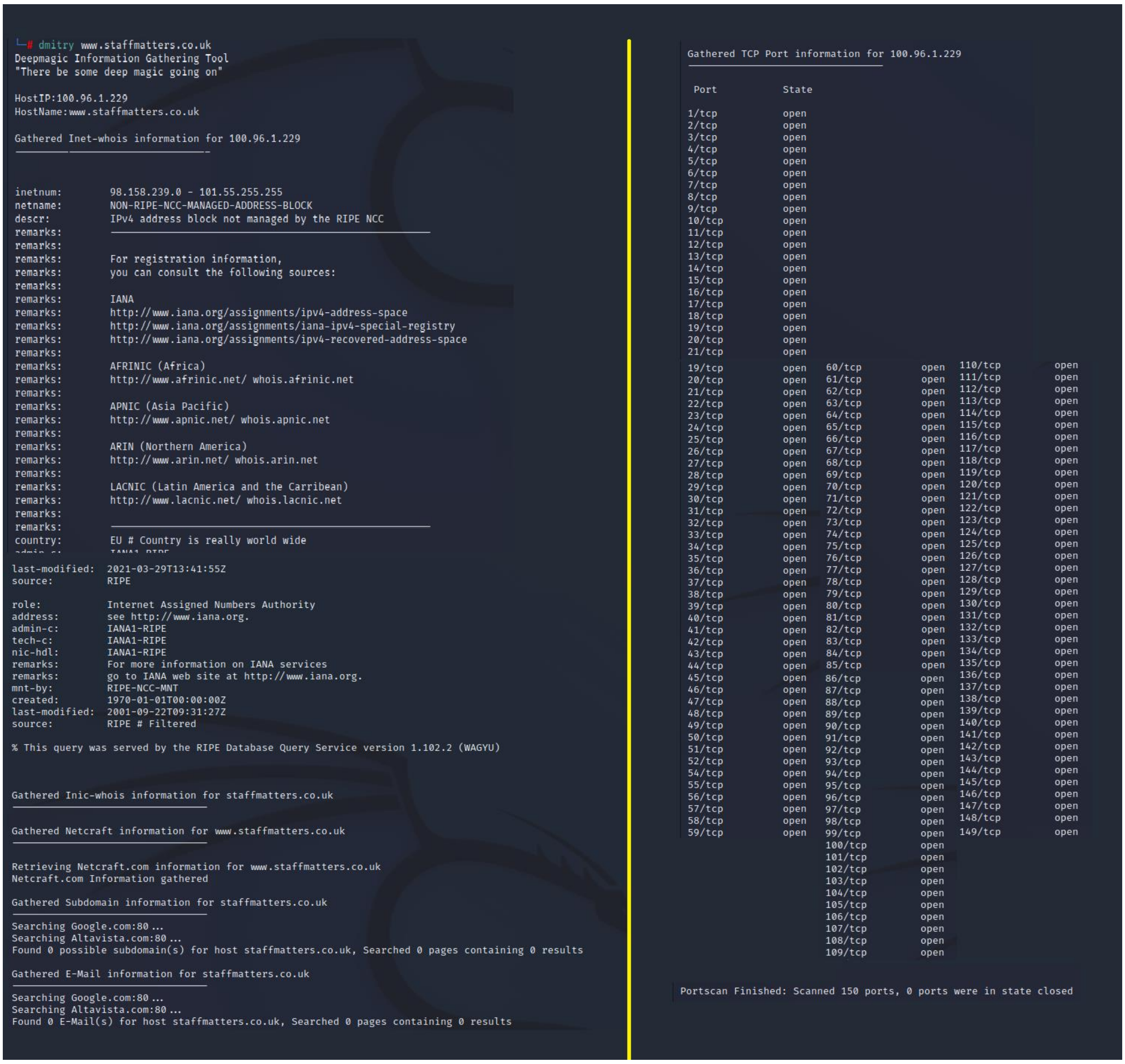
Does it have any open ports?

- I used the tool **sslscan** to scan for SSL ports



```
┌──(root💀 kali)-[~/killshot]
└─# sslscan www.staffmatters.co.uk
Version: 2.0.11-static
OpenSSL 1.1.1n-dev  xx XXX xxxx

Connected to 100.96.1.229

Testing SSL server www.staffmatters.co.uk on port 443 using SNI name www.staffmatters.co.uk

  SSL/TLS Protocols:
SSLv2     disabled
SSLv3     disabled
TLSv1.0   disabled
TLSv1.1   disabled
TLSv1.2   enabled
TLSv1.3   enabled

  TLS Fallback SCSV:
Server supports TLS Fallback SCSV

  TLS renegotiation:
Session renegotiation not supported

  TLS Compression:
Compression disabled

  Heartbleed:
TLSv1.3 not vulnerable to heartbleed
TLSv1.2 not vulnerable to heartbleed

  Supported Server Cipher(s):
Preferred TLSv1.3  256 bits  TLS_AES_256_GCM_SHA384        Curve 25519 DHE 253
Accepted  TLSv1.3  256 bits  TLS_CHACHA20_POLY1305_SHA256  Curve 25519 DHE 253
Accepted  TLSv1.3  128 bits  TLS_AES_128_GCM_SHA256        Curve 25519 DHE 253
Preferred TLSv1.2  256 bits  ECDHE-RSA-AES256-GCM-SHA384   Curve 25519 DHE 253
Accepted  TLSv1.2  256 bits  ECDHE-RSA-CHACHA20-POLY1305   Curve 25519 DHE 253
Accepted  TLSv1.2  128 bits  ECDHE-RSA-AES128-GCM-SHA256   Curve 25519 DHE 253
Accepted  TLSv1.2  256 bits  ECDHE-RSA-AES256-SHA384       Curve 25519 DHE 253
Accepted  TLSv1.2  128 bits  ECDHE-RSA-AES128-SHA256       Curve 25519 DHE 253

  Server Key Exchange Group(s):
TLSv1.3  128 bits  secp256r1 (NIST P-256)
TLSv1.3  192 bits  secp384r1 (NIST P-384)
TLSv1.3  260 bits  secp521r1 (NIST P-521)
TLSv1.3  128 bits  x25519
TLSv1.3  224 bits  x448
TLSv1.2  128 bits  secp256r1 (NIST P-256)
TLSv1.2  192 bits  secp384r1 (NIST P-384)
TLSv1.2  260 bits  secp521r1 (NIST P-521)
TLSv1.2  128 bits  x25519
TLSv1.2  224 bits  x448

  SSL Certificate:
Signature Algorithm: sha256WithRSAEncryption
RSA Key Strength:    2048

Subject:  staffmatters.co.uk
Altnames: DNS:staffmatters.co.uk, DNS:autodiscover.staffmatters.co.uk, DNS:cpanel.staffmatters.co.uk, DNS:cpcalendars.staffmatters.co.uk, DNS:cpcontacts.staffmatter
s.co.uk, DNS:mail.staffmatters.co.uk, DNS:webdisk.staffmatters.co.uk, DNS:webmail.staffmatters.co.uk, DNS:www.staffmatters.co.uk
Issuer:   cPanel, Inc. Certification Authority

Not valid before: Jan 14 00:00:00 2022 GMT
Not valid after:  Apr 14 23:59:59 2022 GMT

┌──(root💀 kali)-[~/killshot]
└─# █
```

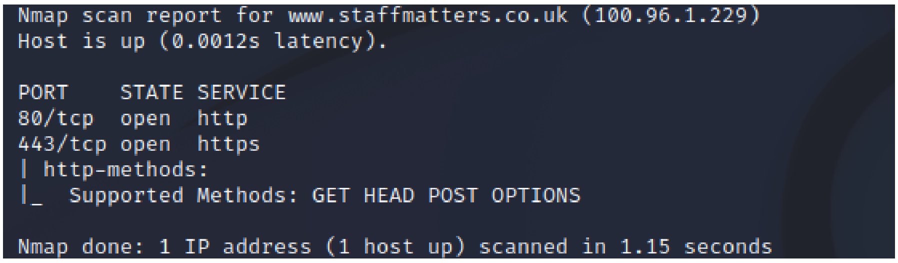
- I used the tool **Dmitry**



```
└─# dmitry www.staffmatters.co.uk
Deepmagic Information Gathering Tool
"There be some deep magic going on"

HostIP:100.96.1.229
HostName:www.staffmatters.co.uk

Gathered Inet-whois information for 100.96.1.229
---------------------------------


inetnum:        98.158.239.0 - 101.55.255.255
netname:        NON-RIPE-NCC-MANAGED-ADDRESS-BLOCK
descr:          IPv4 address block not managed by the RIPE NCC
remarks:        ------------------------------------------------------
remarks:
remarks:        For registration information,
remarks:        you can consult the following sources:
remarks:
remarks:        IANA
remarks:        http://www.iana.org/assignments/ipv4-address-space
remarks:        http://www.iana.org/assignments/iana-ipv4-special-registry
remarks:        http://www.iana.org/assignments/ipv4-recovered-address-space
remarks:
remarks:        AFRINIC (Africa)
remarks:        http://www.afrinic.net/ whois.afrinic.net
remarks:
remarks:        APNIC (Asia Pacific)
remarks:        http://www.apnic.net/ whois.apnic.net
remarks:
remarks:        ARIN (Northern America)
remarks:        http://www.arin.net/ whois.arin.net
remarks:
remarks:        LACNIC (Latin America and the Carribean)
remarks:        http://www.lacnic.net/ whois.lacnic.net
remarks:
remarks:        ------------------------------------------------------
country:        EU # Country is really world wide
last-modified:  2021-03-29T13:41:55Z
source:         RIPE

role:           Internet Assigned Numbers Authority
address:        see http://www.iana.org.
admin-c:        IANA1-RIPE
tech-c:         IANA1-RIPE
nic-hdl:        IANA1-RIPE
remarks:        For more information on IANA services
remarks:        go to IANA web site at http://www.iana.org.
mnt-by:         RIPE-NCC-MNT
created:        1970-01-01T00:00:00Z
last-modified:  2001-09-22T09:31:27Z
source:         RIPE # Filtered

% This query was served by the RIPE Database Query Service version 1.102.2 (WAGYU)


Gathered Inic-whois information for staffmatters.co.uk
---------------------------------

Gathered Netcraft information for www.staffmatters.co.uk
---------------------------------

Retrieving Netcraft.com information for www.staffmatters.co.uk
Netcraft.com Information gathered

Gathered Subdomain information for staffmatters.co.uk
---------------------------------
Searching Google.com:80 ...
Searching Altavista.com:80 ...
Found 0 possible subdomain(s) for host staffmatters.co.uk, Searched 0 pages containing 0 results

Gathered E-Mail information for staffmatters.co.uk
---------------------------------
Searching Google.com:80 ...
Searching Altavista.com:80 ...
Found 0 E-Mail(s) for host staffmatters.co.uk, Searched 0 pages containing 0 results
```

```
Gathered TCP Port information for 100.96.1.229
---------------------------------

 Port           State

1/tcp           open
2/tcp           open
3/tcp           open
4/tcp           open
5/tcp           open
6/tcp           open
7/tcp           open
8/tcp           open
9/tcp           open
10/tcp          open
11/tcp          open
12/tcp          open
13/tcp          open
14/tcp          open
15/tcp          open
16/tcp          open
17/tcp          open
18/tcp          open
19/tcp          open
20/tcp          open
21/tcp          open
19/tcp          open    60/tcp          open    110/tcp         open
20/tcp          open    61/tcp          open    111/tcp         open
21/tcp          open    62/tcp          open    112/tcp         open
22/tcp          open    63/tcp          open    113/tcp         open
23/tcp          open    64/tcp          open    114/tcp         open
24/tcp          open    65/tcp          open    115/tcp         open
25/tcp          open    66/tcp          open    116/tcp         open
26/tcp          open    67/tcp          open    117/tcp         open
27/tcp          open    68/tcp          open    118/tcp         open
28/tcp          open    69/tcp          open    119/tcp         open
29/tcp          open    70/tcp          open    120/tcp         open
30/tcp          open    71/tcp          open    121/tcp         open
31/tcp          open    72/tcp          open    122/tcp         open
32/tcp          open    73/tcp          open    123/tcp         open
33/tcp          open    74/tcp          open    124/tcp         open
34/tcp          open    75/tcp          open    125/tcp         open
35/tcp          open    76/tcp          open    126/tcp         open
36/tcp          open    77/tcp          open    127/tcp         open
37/tcp          open    78/tcp          open    128/tcp         open
38/tcp          open    79/tcp          open    129/tcp         open
39/tcp          open    80/tcp          open    130/tcp         open
40/tcp          open    81/tcp          open    131/tcp         open
41/tcp          open    82/tcp          open    132/tcp         open
42/tcp          open    83/tcp          open    133/tcp         open
43/tcp          open    84/tcp          open    134/tcp         open
44/tcp          open    85/tcp          open    135/tcp         open
45/tcp          open    86/tcp          open    136/tcp         open
46/tcp          open    87/tcp          open    137/tcp         open
47/tcp          open    88/tcp          open    138/tcp         open
48/tcp          open    89/tcp          open    139/tcp         open
49/tcp          open    90/tcp          open    140/tcp         open
50/tcp          open    91/tcp          open    141/tcp         open
51/tcp          open    92/tcp          open    142/tcp         open
52/tcp          open    93/tcp          open    143/tcp         open
54/tcp          open    94/tcp          open    144/tcp         open
55/tcp          open    95/tcp          open    145/tcp         open
56/tcp          open    96/tcp          open    146/tcp         open
57/tcp          open    97/tcp          open    147/tcp         open
58/tcp          open    98/tcp          open    148/tcp         open
59/tcp          open    99/tcp          open    149/tcp         open
                        100/tcp         open
                        101/tcp         open
                        102/tcp         open
                        103/tcp         open
                        104/tcp         open
                        105/tcp         open
                        106/tcp         open
                        107/tcp         open
                        108/tcp         open
                        109/tcp         open

Portscan Finished: Scanned 150 ports, 0 ports were in state closed
```

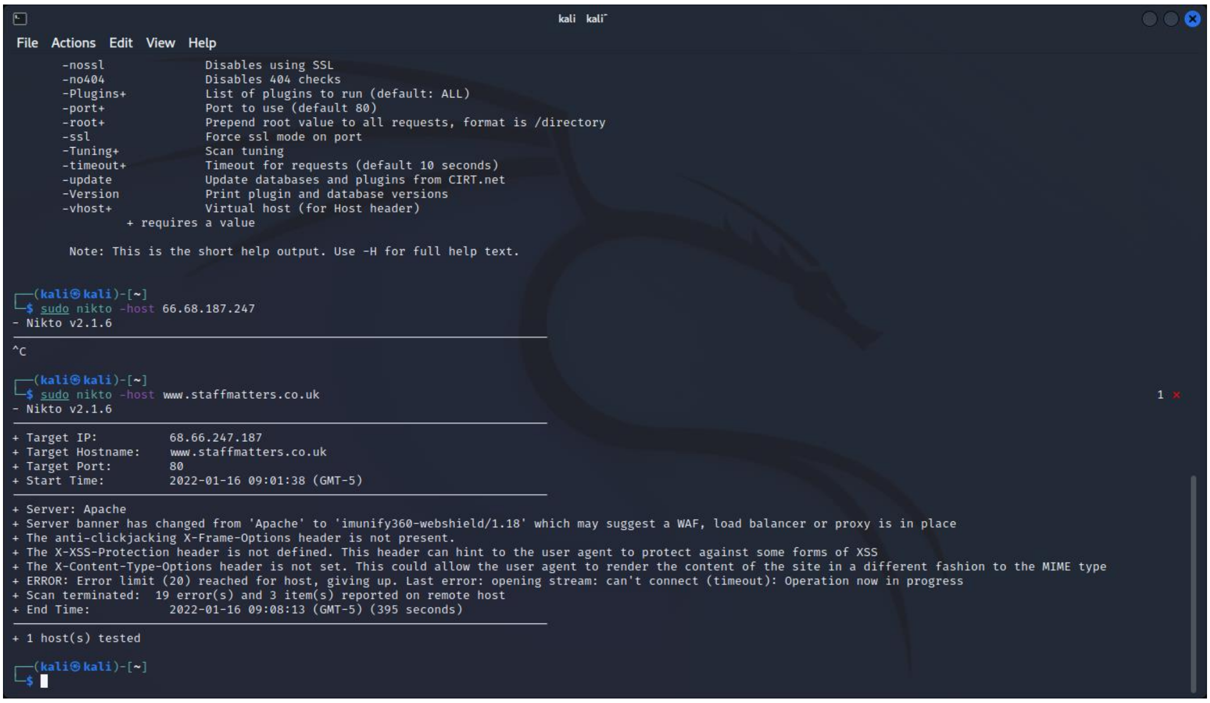
- I used **nmap** to scan HTTP ports



```
Nmap scan report for www.staffmatters.co.uk (100.96.1.229)
Host is up (0.0012s latency).

PORT    STATE SERVICE
80/tcp  open  http
443/tcp open  https
| http-methods:
|_  Supported Methods: GET HEAD POST OPTIONS

Nmap done: 1 IP address (1 host up) scanned in 1.15 seconds
```

Does the site have any known vulnerabilities?

- I used the tool **nikto**



```
       -nossl              Disables using SSL
       -no404              Disables 404 checks
       -Plugins+           List of plugins to run (default: ALL)
       -port+              Port to use (default 80)
       -root+              Prepend root value to all requests, format is /directory
       -ssl                Force ssl mode on port
       -Tuning+            Scan tuning
       -timeout+           Timeout for requests (default 10 seconds)
       -update             Update databases and plugins from CIRT.net
       -Version            Print plugin and database versions
       -vhost+             Virtual host (for Host header)
                + requires a value

        Note: This is the short help output. Use -H for full help text.


┌──(kali㉿kali)-[~]
└─$ sudo nikto -host 66.68.187.247
- Nikto v2.1.6
---------------------------------------------------------------------------
^C

┌──(kali㉿kali)-[~]
└─$ sudo nikto -host www.staffmatters.co.uk                                                                                   1 ×
- Nikto v2.1.6
---------------------------------------------------------------------------
+ Target IP:          68.66.247.187
+ Target Hostname:    www.staffmatters.co.uk
+ Target Port:        80
+ Start Time:         2022-01-16 09:01:38 (GMT-5)
---------------------------------------------------------------------------
+ Server: Apache
+ Server banner has changed from 'Apache' to 'imunify360-webshield/1.18' which may suggest a WAF, load balancer or proxy is in place
+ The anti-clickjacking X-Frame-Options header is not present.
+ The X-XSS-Protection header is not defined. This header can hint to the user agent to protect against some forms of XSS
+ The X-Content-Type-Options header is not set. This could allow the user agent to render the content of the site in a different fashion to the MIME type
+ ERROR: Error limit (20) reached for host, giving up. Last error: opening stream: can't connect (timeout): Operation now in progress
+ Scan terminated:  19 error(s) and 3 item(s) reported on remote host
+ End Time:           2022-01-16 09:08:13 (GMT-5) (395 seconds)
---------------------------------------------------------------------------
+ 1 host(s) tested

┌──(kali㉿kali)-[~]
└─$ █
```

1. The response message contains “X-XSS-Protection” header
2. The response message contains “X-Content-Type-Options”

- CVE vulnerabilities were provided by a fellow team member: Orangehrm : Security vulnerabilities (cvedetails.com)

What versions of software is it using? Are these patched so that they are up to date?

I did not find a way to scan for software installations on the server