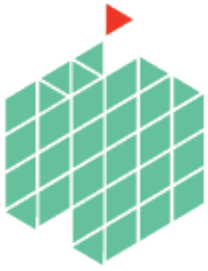
Linux Advanced Privilege Escalation



UITSEC

Universal IT Security Consulting

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Table of contents

Introduction
Kernel Exploits
Applications & Services
Common passwords
Suid and Guid Misconfiguration
Finding hardcoded passwords
Finding SSH private keys
Cron Jobs
Spawning shells
Finding unmounted file-systems
Finding error messages/requests in the logs
Finding scripts that can be invoked as root
Useful Enumeration scripts
References

Introduction:
In this guide, I've combined and wrote the most useful techniques that I was doing to escalate my privileges on Linux systems for our clients and internal penetration tests at UITSEC.

Once we get a limited shell it is useful to escalate that shells privileges.
In this chapter we'll be going to list common Linux privilege escalation techniques:
Kernel exploits
Processes
Programs running as root
Installed software
Weak/reused/plaintext passwords
Inside service
Suid misconfiguration
Abusing sudo-rights
World writable scripts invoked by root
Bad path configuration
Cronjobs
Unmounted filesystems

Kernel Exploits

By exploiting vulnerabilities in the Linux Kernel, we can sometimes escalate our privileges. What we usually need to know to test if a kernel exploit works is the OS, architecture and kernel version.
Check the OS / Architecture / Kernel version:

```
uname -a
cat /proc/version
cat /etc/issue
cat /etc/*-release
 cat /etc/lsb-release      # Debian based
  cat /etc/redhat-release   # Redhat based

uname -mrs
rpm -q kernel
dmesg | grep Linux
ls /boot | grep vmlinuz-
```

Search for exploits using Google

```
site:exploit-db.com kernel version
```

Applications & Services
LOTs of times I make privilege escalations using the running applications or services on Linux systems, as an example Nmap interactive mode.

Here I want notice to a **very important** thing while enumerating the running applications, ALWAYS check the command section when you run this command:
ps -aux

```
ps aux
ps -ef
top
cat /etc/services
```

Mysql
Whenever you find a Mysql running on the system first try to login to it using Root user and common passwords, also don't forget to try to login also without a password ☺ I learned a **good lesson in this while studying OSCP**

```
Mysql -u root -p   -< then enter root as the passwords or 123456
Mysql -u root  -< try without a passwords sometimes you maybe able to login.
select sys_exec('whoami');
select sys_eval('whoami');
```

The above commands will give us a list of the current running applications and services, what matter to us is to see what services is running as root using the following command:

```
ps aux | grep root
ps -ef | grep root
```

Get a list of the installed application and check if they're running.
Then Google the application version and see if there's a public exploit for it.

```
ls -alh /usr/bin/
ls -alh /sbin/
dpkg -l
rpm -qa
ls -alh /var/cache/apt/archivesO
ls -alh /var/cache/yum/
```

Check the services configurations, also sometimes you may find a passwords in these files that may lead you to make another high privileged actions on the system, or you may find a FTP server that allows an anonymous user to write/upload file in the Root Directory, theses mistakes is common, for the network administrators and developers as well.

```
cat /etc/syslog.conf
cat /etc/chttp.conf
cat /etc/lighttpd.conf
cat /etc/cups/cupsd.conf
cat /etc/inetd.conf
cat /etc/apache2/apache2.conf
cat /etc/my.conf
cat /etc/httpd/conf/httpd.conf
cat /opt/lampp/etc/httpd.conf
ls -aRl /etc/ | awk '$1 ~ /^.*r.*/
```

Common passwords
Some popular passwords, whenever you find something you have to login to it try them

```
Admin:admin (try this always, and you maybe lucky )
username:username
username:username1
username:root
username:admin
username:qwerty
username:password
```

Suid and Guid Misconfiguration
When a binary with suid permission is run it is run as another user, and therefore with the other users privileges. It could be root, or just another user. If the suid-bit is set on a program that can spawn a shell or in another way be abuse we could use that to escalate our privileges. For example, these are some programs that can be used to spawn a shell:

```
nmap
vim
less
more
nano
cp
mv
find
```

Find suid and guid files

```
#Find SUID
find / -perm -u=s -type f 2>/dev/null

#Find GUID
find / -perm -g=s -type f 2>/dev/null

find / -perm -u=s -type f 2>/dev/null

find / -perm -g=s -o -perm -u=s -type f 2>/dev/null

find / -perm -g=s -o -perm -4000 ! -type l -maxdepth 3 -exec ls -ld {} \; 2>/dev/null
```

Finding hardcoded passwords

```
#finding them in history files
cat ~/.bash_history
cat ~/.nano_history
cat ~/.atftp_history
cat ~/.mysql_history
cat ~/.php_history

#some important files that may contain plain text passwords
cat /var/apache2/config.inc
cat /var/lib/mysql/mysql/user.MYD
cat /root/anaconda-ks.cfg
cat /etc/syslog.conf
cat /etc/chttp.conf
cat /etc/lighttpd.conf
cat /etc/cups/cupsd.conf
cat /etc/inetd.conf
cat /etc/apache2/apache2.conf
cat /etc/my.conf
cat /etc/httpd/conf/httpd.conf
cat /opt/lampp/etc/httpd.conf
ls -aRl /etc/ | awk '$1 ~ /^.*r.*/

#Finding them by searching
for i in txt csv xls xlsx doc docx php conf;
do
   find /cygdrive/t  -name \*.$i >> target_file_names.txt
done
```

Finding SSH private keys

```
cat ~/.ssh/authorized_keys
cat ~/.ssh/identity.pub
cat ~/.ssh/identity
cat ~/.ssh/id_rsa.pub
cat ~/.ssh/id_rsa
cat ~/.ssh/id_dsa.pub
cat ~/.ssh/id_dsa
cat /etc/ssh/ssh_config
cat /etc/ssh/sshd_config
cat /etc/ssh/ssh_host_dsa_key.pub
cat /etc/ssh/ssh_host_dsa_key
cat /etc/ssh/ssh_host_rsa_key.pub
cat /etc/ssh/ssh_host_rsa_key
cat /etc/ssh/ssh_host_key.pub
cat /etc/ssh/ssh_host_key
```

Finding unmounted file-systems

```
mount
df -h
cat /etc/fstab
```

What root commands that can be executed as root user for the current user

```
Sudo -l
```

Cron Jobs

```
crontab -l  #notice this command is important  try it first
ls -alh /var/spool/cron
ls -al /etc/ | grep cron
ls -al /etc/cron*
cat /etc/cron*
cat /etc/at.allow
cat /etc/at.deny
cat /etc/cron.allow
cat /etc/cron.deny
cat /etc/crontab
cat /etc/anacrontab
cat /var/spool/cron/crontabs/root
```

Finding scripts that can be invoked as root

```
#World writable files directories
find / -writable -type d 2>/dev/null
find / -perm -222 -type d 2>/dev/null
find / -perm -o w -type d 2>/dev/null

# World executable folder
find / -perm -o x -type d 2>/dev/null

# World writable and executable folders
find / \( -perm -o w -perm -o x \) -type d 2>/dev/null
```

Finding error messages/requests in the logs

```
cat /etc/httpd/logs/access_log
cat /etc/httpd/logs/access.log
cat /etc/httpd/logs/error_log
cat /etc/httpd/logs/error.log
cat /var/log/apache2/access_log
cat /var/log/apache2/access.log
cat /var/log/apache2/error_log
cat /var/log/apache2/error.log
cat /var/log/apache/access_log
cat /var/log/apache/access.log
cat /var/log/auth.log
cat /var/log/chttp.log
cat /var/log/cups/error_log
cat /var/log/dpkg.log
cat /var/log/faillog
cat /var/log/httpd/access_log
cat /var/log/httpd/access.log
cat /var/log/httpd/error_log
cat /var/log/httpd/error.log
cat /var/log/lastlog
cat /var/log/lighttpd/access.log
cat /var/log/lighttpd/error.log
cat /var/log/lighttpd/lighttpd.access.log
cat /var/log/lighttpd/lighttpd.error.log
cat /var/log/messages
cat /var/log/secure
cat /var/log/syslog
cat /var/log/wtmp
cat /var/log/xferlog
cat /var/log/yum.log
cat /var/run/utmp
cat /var/webmin/miniserv.log
cat /var/www/logs/access_log
cat /var/www/logs/access.log
ls -alh /var/lib/dhcp3/
ls -alh /var/log/postgresql/
ls -alh /var/log/proftpd/
ls -alh /var/log/samba/
```

Spawning shells

```
python -c 'import pty;pty.spawn("/bin/bash")'
echo os.system('/bin/bash')
/bin/sh -i
```

Useful Enumeration scripts

https://github.com/rebootuser/LinEnum
http://pentestmonkey.net/tools/audit/unix-privesc-check
https://github.com/reider-roque/linpostexp/blob/master/linprivchecker.py

References:

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https://chryzsh.gitbooks.io/pentestbook
https://www.thegeekstuff.com/2011/08/linux-var-log-files
https://stackoverflow.com/questions/34032651/searching-an-entire-drive-for-plaintext-passwords