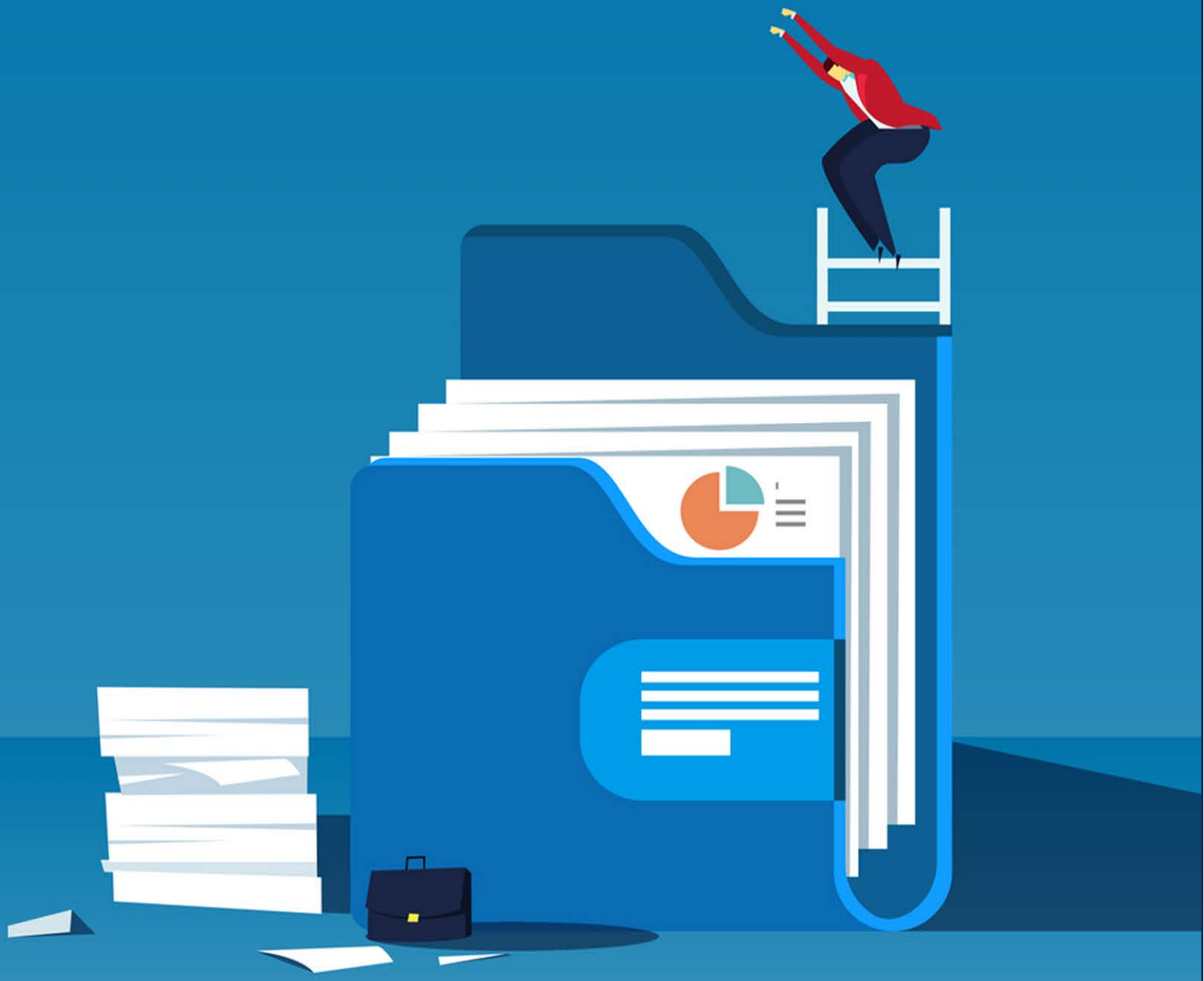
iGNITE Technologies

Active Directory Enumeration

Powerview



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Introduction

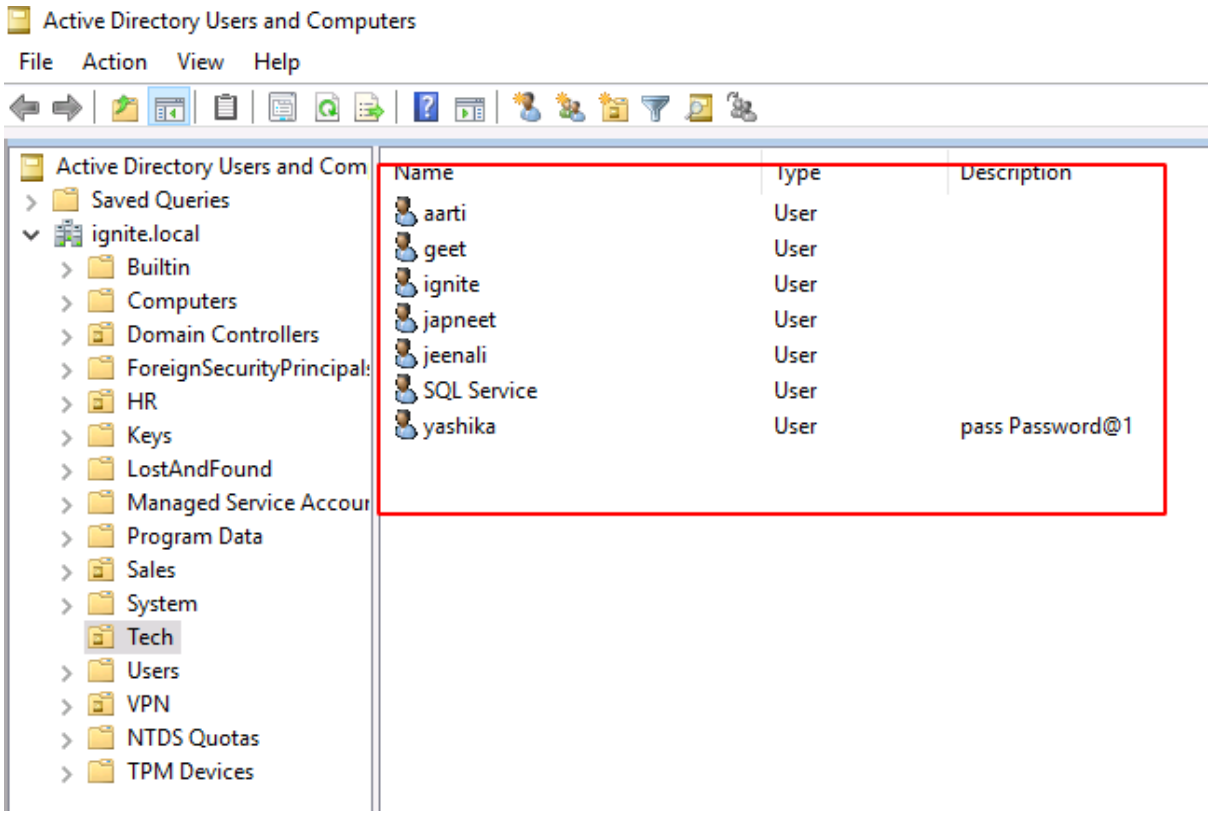
In this guide, we will explore how to perform Active Directory enumeration using PowerView, a powerful tool within PowerShell. PowerView enables penetration testers and security professionals to gather crucial information about an Active Directory environment, aiding in post-exploitation and lateral movement. By leveraging PowerView for Active Directory enumeration, you can identify valuable targets and enhance your security assessment capabilities.

Active Directory Enumeration is a challenge for even some of the seasoned attackers and it is easy to miss some key components and lose the change to elevate that initial foothold that you might receive. In this article, we bring you methods that you can use to enumerate AD using PowerShell.

We have configured an Active Directory Lab that mimics a Real-Life Environment with a bunch of Users, Machines, and Vulnerabilities. In this Article/Demonstration, we are focused on our ability to Enumerate Information that can then further be used to elevate privileges or be able to help with Lateral Movement. A tool by the name of PowerView was developed and integrated **by Will Schroeder (a.k.a harmj0y)**. It soon became an integral toolkit to perform Active Directory Attacks and Enumeration. For this demonstration, we will assume that we have gained the initial foothold. Now we will use PowerShell with PowerView to enumerate the machine and the Domain. In case you run into difficulties running any of the commands depicted use the Official GitHub for the Installation Process.

Get-NetUser

In our Active Directory Lab Setup, we created 7 users with different roles and privileges. We can confirm this by Viewing the Active Directory Users and Computers as shown in the image.



Running PowerView for Enumeration

This setup helps demonstrate and correlate the information we are about to enumerate using PowerShell. The attacker has transferred the PowerView to the Target System. To run the PowerShell Script on the System, the Execution Policy must be set to Bypass as shown in the image. Next, the attacker imports the Modules from the PowerView Script. This is a one-time process. After this, the attacker can directly use the Modules to perform Enumeration. To get the users that are active on the Network, the attacker runs the following command.

```
Get-NetUser
```

```
PS C:\Users\Administrator> cd .\Desktop\
PS C:\Users\Administrator\Desktop> powershell -ep bypass
Windows PowerShell
Copyright (C) 2016 Microsoft Corporation. All rights reserved.

PS C:\Users\Administrator\Desktop> Import-Module .\powerview.ps1
PS C:\Users\Administrator\Desktop> Get-NetUser


logoncount             : 90
badpasswordtime        : 4/7/2021 7:25:25 AM
description            : Built-in account for administering the computer/domain
distinguishedname      : CN=Administrator,CN=Users,DC=ignite,DC=local
objectclass            : {top, person, organizationalPerson, user}
lastlogontimestamp     : 4/2/2021 1:34:59 PM
name                   : Administrator
objectsid              : S-1-5-21-501555289-2168925624-2051597760-500
samaccountname         : Administrator
admincount             : 1
codepage               : 0
samaccounttype         : 805306368
whenchanged            : 4/2/2021 8:34:59 PM
accountexpires         : 9223372036854775807
countrycode            : 0
adspath                : LDAP://CN=Administrator,CN=Users,DC=ignite,DC=local
instancetype           : 4
objectguid             : c00f6d7e-69c7-44cf-ba81-0a513e8aaac4
lastlogon              : 4/11/2021 3:32:09 AM
lastlogoff             : 12/31/1600 4:00:00 PM
objectcategory         : CN=Person,CN=Schema,CN=Configuration,DC=ignite,DC=local
dscorepropagationdata  : {7/6/2020 5:39:37 PM, 7/6/2020 5:39:37 PM, 6/29/2020 4:54:4
memberof               : {CN=Group Policy Creator Owners,CN=Users,DC=ignite,DC=local
whencreated            : 6/29/2020 4:54:05 PM
iscriticalsystemobject : True
badpwdcount            : 0
cn                     : Administrator
useraccountcontrol     : 66048
usncreated             : 8196
primarygroupid         : 513
pwdlastset             : 6/29/2020 9:40:26 AM
usnchanged             : 106631

pwdlastset             : 12/31/1600 4:00:00 PM
logoncount             : 0
badpasswordtime        : 12/31/1600 4:00:00 PM
description            : Built-in account for guest access to the computer/domain
```

The users that are enumerated are not just restricted to usernames. The data collected also consists of logoncount. It gives an idea of an active or inactive user in the network. Next, there is a badpasswordtime. It tells the last time and date when an attempt to log on was made with an invalid password on this account. Then, there is a small description of the user. It includes the names of groups that this particular user is part of. At last, it shows the date and time since the last password change. This information is very important. It helps the attacker learn about the user Behavior.

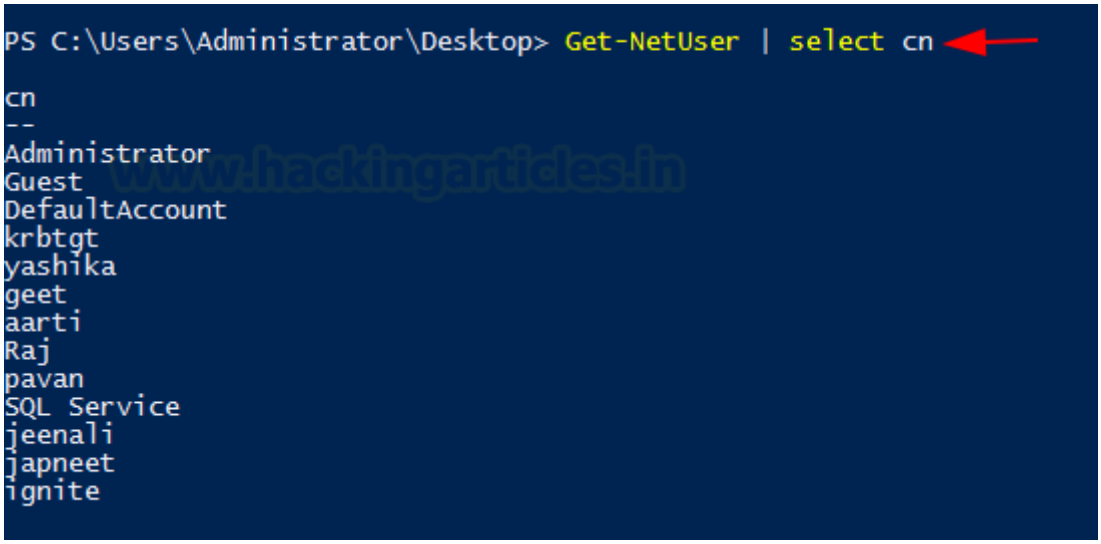
```
logoncount             : 60
badpasswordtime        : 4/7/2021 7:12:41 AM
description            : pass Password@1
distinguishedname      : CN=yashika,OU=Tech,DC=ignite,DC=local
objectclass            : {top, person, organizationalPerson, user}
displayname            : yashika
lastlogontimestamp     : 4/7/2021 7:12:47 AM
userprincipalname      : yashika@ignite.local
name                   : yashika
objectsid              : S-1-5-21-501555289-2168925624-2051597760-1103
samaccountname         : yashika
admincount             : 1
codepage               : 0
samaccounttype         : 805306368
whenchanged            : 4/10/2021 2:08:59 PM
accountexpires         : 9223372036854775807
countrycode            : 0
adspath                : LDAP://CN=yashika,OU=Tech,DC=ignite,DC=local
instancetype           : 4
objectguid             : d2ff2fb0-5f92-471b-b94c-a1bc5be262f2
lastlogon              : 4/10/2021 7:26:55 AM
lastlogoff             : 12/31/1600 4:00:00 PM
objectcategory         : CN=Person,CN=Schema,CN=Configuration,DC=ignite,DC=local
dscorepropagationdata  : {3/26/2021 6:37:49 PM, 1/1/1601 12:00:00 AM}
givenname              : yashika
memberof               : CN=Domain Admins,CN=Users,DC=ignite,DC=local
whencreated            : 6/29/2020 5:08:49 PM
badpwdcount            : 0
cn                     : yashika
useraccountcontrol     : 66048
usncreated             : 16577
primarygroupid         : 513
pwdlastset             : 6/29/2020 10:08:49 AM
usnchanged             : 200768

logoncount             : 1
badpasswordtime        : 12/31/1600 4:00:00 PM
distinguishedname      : CN=geet,OU=Tech,DC=ignite,DC=local
objectclass            : {top, person, organizationalPerson, user}
displayname            : geet
lastlogontimestamp     : 4/7/2021 7:23:57 AM
userprincipalname      : geet@ignite.local
name                   : geet
objectsid              : S-1-5-21-501555289-2168925624-2051597760-1104
samaccountname         : geet
admincount             : 1
codepage               : 0
samaccounttype         : 805306368
whenchanged            : 4/7/2021 2:23:57 PM
accountexpires         : 9223372036854775807
countrycode            : 0
adspath                : LDAP://CN=geet,OU=Tech,DC=ignite,DC=local
instancetype           : 4
usncreated             : 16584
objectguid             : 944569dc-bae7-400b-8ba3-68bd6849a8ef
lastlogoff             : 12/31/1600 4:00:00 PM
objectcategory         : CN=Person,CN=Schema,CN=Configuration,DC=ignite,DC=local
dscorepropagationdata  : {4/7/2021 1:47:03 PM, 1/1/1601 12:00:00 AM}
givenname              : geet
memberof               : CN=Backup Operators,CN=Builtin,DC=ignite,DC=local
lastlogon              : 4/7/2021 7:23:57 AM
badpwdcount            : 0
cn                     : geet
```

Filtering and Targeting Specific Users

Similar Information is available for the users Yashika and Geet.

To get an abstract list of users created on the Network, the attacker grabs the Common Name. This is done by using the select command on the output of the Get-NetUser Module.

```
Get-NetUser | select cn
```



Administrator, Yashika, Geet, Aarti, Raj, Pavan, Jeenali, Japneet, etc. are the various users in this Network Environment.

Similarly, to gather information about a particular user, the attacker can target a specific account. For example, after the attacker extracts users in the previous section, they choose a particular user. Now, more information about that user is required. This can be done using a flag -Username with the username that the attacker wants to target. In this case, the attacker chooses the Yashika User.

```
Get-NetUser -UserName yashika
```

```
PS C:\Users\Administrator\Desktop> Get-NetUser -UserName yashika


logoncount             : 60
badpasswordtime        : 4/7/2021 7:12:41 AM
description            : pass Password@1
distinguishedname      : CN=yashika,OU=Tech,DC=ignite,DC=local
objectclass            : {top, person, organizationalPerson, user}
displayname            : yashika
lastlogontimestamp     : 4/7/2021 7:12:47 AM
userprincipalname      : yashika@ignite.local
name                   : yashika
objectsid              : S-1-5-21-501555289-2168925624-2051597760-1103
samaccountname         : yashika
admincount             : 1
codepage               : 0
samaccounttype         : 805306368
whenchanged            : 4/10/2021 2:08:59 PM
accountexpires         : 9223372036854775807
countrycode            : 0
adspath                : LDAP://CN=yashika,OU=Tech,DC=ignite,DC=local
instancetype           : 4
objectguid             : d2ff2fb0-5f92-471b-b94c-a1bc5be262f2
lastlogon              : 4/10/2021 7:26:55 AM
lastlogoff             : 12/31/1600 4:00:00 PM
objectcategory         : CN=Person,CN=Schema,CN=Configuration,DC=ignite,DC=local
dscorepropagationdata  : {3/26/2021 6:37:49 PM, 1/1/1601 12:00:00 AM}
givenname              : yashika
memberof               : CN=Domain Admins,CN=Users,DC=ignite,DC=local
whencreated            : 6/29/2020 5:08:49 PM
badpwdcount            : 0
cn                     : yashika
useraccountcontrol     : 66048
usncreated             : 16577
primarygroupid         : 513
pwdlastset             : 6/29/2020 10:08:49 AM
usnchanged             : 200768
```

A streamlined but detailed output regarding the Yashika user is extracted by the attacker.

Get-UserProperty

When working with the Users and their properties, we see that there is a variable by the name pwdlastset. We can use this to check which user is reluctant to change their passwords. This can be configured to any of the property that was extracted in the previous. For this demonstration, we will be extracting the password last set property of all the users.

```
Get-UserProperty -Properties pwdlastset
```

```
PS C:\Users\Administrator\Desktop> Get-UserProperty -Properties pwdlastset

name           pwdlastset
----           ----------
Administrator  6/29/2020 9:40:26 AM
Guest          12/31/1600 4:00:00 PM
DefaultAccount 12/31/1600 4:00:00 PM
krbtgt         6/29/2020 9:54:43 AM
yashika        6/29/2020 10:08:49 AM
geet           6/29/2020 10:09:17 AM
aarti          6/29/2020 10:10:52 AM
Raj            7/6/2020 10:33:10 AM
pavan          7/6/2020 12:24:15 PM
SQL Service    4/3/2021 9:17:09 AM
jeenali        4/5/2021 12:31:09 PM
japneet        4/5/2021 12:32:28 PM
ignite         4/9/2021 8:43:37 AM
```

Find-UserField

There are times when the network has so many users that it becomes difficult for the Domain Administrator to track all users and their credentials. In such cases, administrators sometimes resort to risky methods to save credential information. A common example I've encountered in real environments is saving credentials or important user details in the user description.

Using Find-UserField for Enumeration

This information can be extracted using the Find-UserField command with a specific search term. In this demonstration, we used the term "pass" to search for potential passwords. As seen, the user Yashika had their password written and saved in the description.

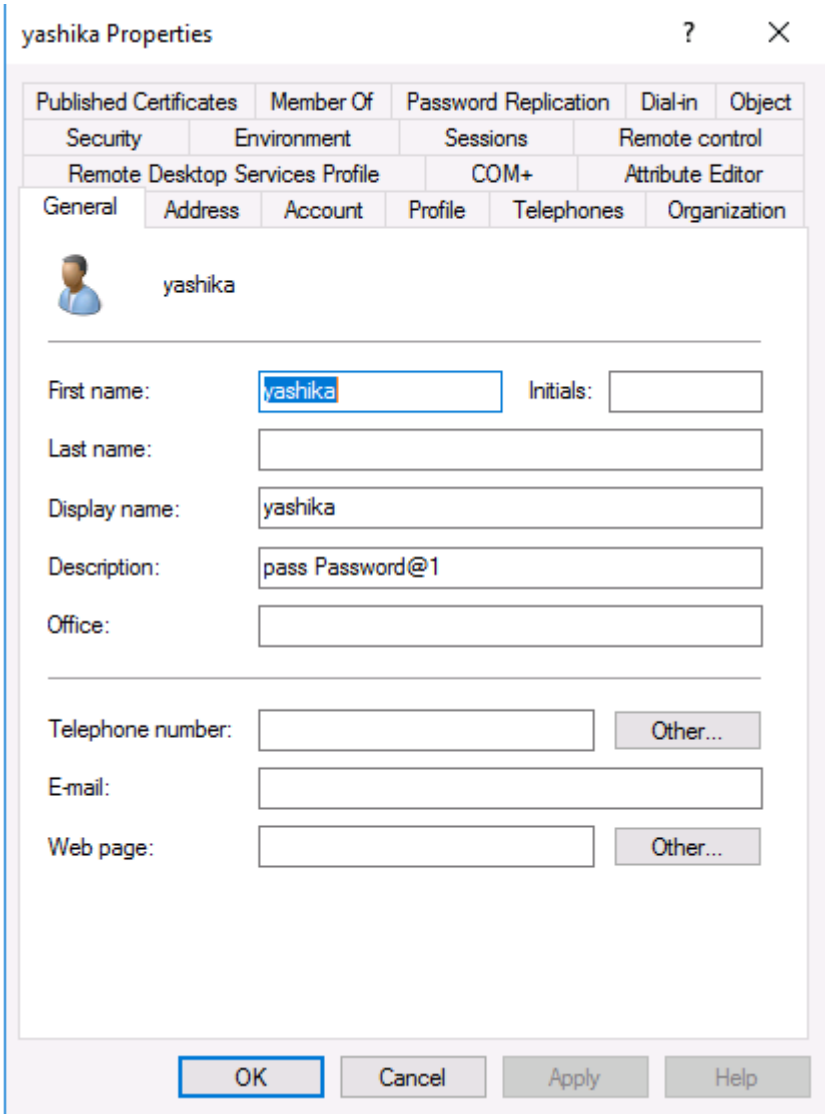
This technique is not limited to passwords. By using the right set of keywords, such as "built," attackers can also identify built-in accounts. The following commands can help with this:

```
Find-UserField -SearchField Description -SearchTerm "pass"
Find-UserField -SearchField Description -SearchTerm "built"
```

```
PS C:\Users\Administrator\Desktop> Find-UserField -SearchField Description -SearchTerm "pass"

samaccountname description
-------------- -----------
yashika        pass Password@1

PS C:\Users\Administrator\Desktop> Find-UserField -SearchField Description -SearchTerm "built"

samaccountname description
-------------- -----------
Administrator  Built-in account for administering the computer/domain
Guest          Built-in account for guest access to the computer/domain
```

The information extracted using the Find-UserField command comes from the Properties of a user. On the server, you can view these properties by opening the user list, right-clicking on any user, and selecting Properties. This will display a window, similar to the one shown in the image below. In this example, the Administrator has stored their password in the Description Field.

It's important to note that this is a major security risk. From the attacker's perspective, always check for such descriptions, as they may contain valuable information that can help further the attack.



Invoke-UserHunter

The Invoke-UserHunter module in PowerView is used to locate where specific users are currently logged in within an Active Directory environment. This is especially useful for attackers or red teamers who want to identify systems where privileged users (like Domain Admins) are active, enabling targeted attacks like credential dumping or lateral movement.

```
Invoke-UserHunter
```

By default, this command searches for sessions of users who are members of high-privileged groups (e.g., Domain Admins).

```
PS C:\Users\Administrator\Desktop> Invoke-UserHunter


UserDomain   : IGNITE
UserName     : Administrator
ComputerName : DC1.ignite.local
IP           : 192.168.1.172
SessionFrom  :
LocalAdmin   :
```

Parameters

- -UserName <name> – Target a specific username.
- -CheckAccess – Filter systems that you have admin rights to (very useful for practical attacks).
- -Stealth – Uses fewer queries to evade detection, but may miss some results.
- -Delay <seconds> – Adds a delay between queries (helps avoid detection by monitoring systems).

```
Invoke-UserHunter -CheckAccess
```

```
PS C:\Users\Administrator\Desktop> Invoke-UserHunter -CheckAccess


UserDomain   : IGNITE
UserName     : Administrator
ComputerName : DC1.ignite.local
IP           : 192.168.1.172
SessionFrom  :
LocalAdmin   : True
```

Why It's Useful:

- Helps attackers focus efforts on machines with high-value targets.
- Reduces noise by skipping irrelevant machines.
- Assists Blue Teamers in understanding attacker behavior and improving defenses (e.g.,
- limiting interactive logins for privileged users).

Get-NetDomain

When attackers need to extract domain-related information directly from the target server, they can rely on Get-NetDomain. This command extracts various Domain data, including the Forest Name and Domain Controllers with Children (which might be configured in a real environment server). It also retrieves the Name of the Parents, along with the RidRoleOwner—a Domain Controller (DC) Object that holds the Relative Identifier (RID) master role—and the PdcRoleOwner, which is another DC Object that holds the PDC emulator role for that specific Domain.

```
Get-NetDomain
```

```
PS C:\Users\Administrator\Desktop> Get-NetDomain


Forest                  : ignite.local
DomainControllers       : {DC1.ignite.local}
Children                : {}
DomainMode              : Unknown
DomainModeLevel         : 7
Parent                  :
PdcRoleOwner            : DC1.ignite.local
RidRoleOwner            : DC1.ignite.local
InfrastructureRoleOwner : DC1.ignite.local
Name                    : ignite.local
```

In case the attacker wanted to go against a specific domain, they can use a domain option by providing the name of the exact domain that they are looking for and Get-NetDomain will extract the data for that particular domain.

```
Get-NetDomain -domain "ignite.local"
```

```
PS C:\Users\Administrator\Desktop> Get-NetDomain -domain "ignite.local"


Forest                  : ignite.local
DomainControllers       : {DC1.ignite.local}
Children                : {}
DomainMode              : Unknown
DomainModeLevel         : 7
Parent                  :
PdcRoleOwner            : DC1.ignite.local
RidRoleOwner            : DC1.ignite.local
InfrastructureRoleOwner : DC1.ignite.local
Name                    : ignite.local
```

Get-NetDomainController

Next on the lineup, we have the Get-NetDomainController. This provides the information of the particular server device instead of the domain. When an attacker wants to extract the data about the Domain Controller Machine then this tool can be used. It extracts the Forest Information, with the Time and Date configured on the Server. IT tells the OS Version that can help constraint the search for Kernel Exploits for the attacker. Then the attacker has the IP Addressing data with the Inbound and Outbound connections.

```
Get-NetDomainController
```

```
PS C:\Users\Administrator\Desktop> Get-NetDomainController


Forest                        : ignite.local
CurrentTime                   : 4/11/2021 10:45:09 AM
HighestCommittedUsn           : 213062
OSVersion                     : Windows Server 2016 Standard Evaluation
Roles                         : {SchemaRole, NamingRole, PdcRole, RidRole...}
Domain                        : ignite.local
IPAddress                     : ::1
SiteName                      : Default-First-Site-Name
SyncFromAllServersCallback    :
InboundConnections            : {}
OutboundConnections           : {}
Name                          : DC1.ignite.local
Partitions                    : {DC=ignite,DC=local, CN=Configuration,DC=ignite,DC=local,
```

Similar to the Get-NetDomain the attacker can configure Get-NetDomainController to be targeted to a specific domain. The scenario that the attacker might be looking at multiple domains set up with multiple server setup so the attacker can use the -Domain option to target that specific Domain Controller inside the Domain.

```
Get-NetDomainController -Domain ignite.local
```

```
PS C:\Users\Administrator\Desktop> Get-NetDomainController -Domain ignite.local


Forest                        : ignite.local
CurrentTime                   : 4/11/2021 10:45:24 AM
HighestCommittedUsn           : 213062
OSVersion                     : Windows Server 2016 Standard Evaluation
Roles                         : {SchemaRole, NamingRole, PdcRole, RidRole...}
Domain                        : ignite.local
IPAddress                     : ::1
SiteName                      : Default-First-Site-Name
SyncFromAllServersCallback    :
InboundConnections            : {}
OutboundConnections           : {}
Name                          : DC1.ignite.local
Partitions                    : {DC=ignite,DC=local, CN=Configuration,DC=ignite,DC=local,
```

Get-NetComputer

What seems to be a pretty simple option can turn out to be one of the most used tools to extract a huge amount of data from either the Domain Controller or even a single device. If the attacker runs the Get-NetComputer directly on the Domain Controller machine as demonstrated, it will reveal the Computer Names of all the devices connected in the Domain.

```
Get-NetComputer
```

```
PS C:\Users\Administrator\Desktop> Get-NetComputer
DC1.ignite.local
client.ignite.local
DESKTOP-ATNONJ9.ignite.local
WIN-3Q7NEBI2561.ignite.local
```

Moving on, if the attacker decides to use -Ping Option then they can get the list of all the devices that can be pinged from the machine they are running the Get-NetComputer from.

```
Get-NetComputer -Ping
```

```
PS C:\Users\Administrator\Desktop> Get-NetComputer -Ping
DC1.ignite.local
```

If the attacker doesn't want to extract the data one parameter at a time there is an option to extract all the data from the Machine. This can be done with the FullData option, but keep in mind that a large amount of data extraction leads to large chances of getting detected.

```
Get-NetComputer -FullData
```

```
PS C:\Users\Administrator\Desktop> Get-NetComputer -FullData


pwdlastset                    : 4/7/2021 5:30:23 AM
logoncount                    : 147
msds-generationid             : {168, 207, 198, 26...}
serverreferencebl             : CN=DC1,CN=Servers,CN=Default-First-Site-Name,CN=Sites,CN=Con
badpasswordtime               : 12/31/1600 4:00:00 PM
distinguishedname             : CN=DC1,OU=Domain Controllers,DC=ignite,DC=local
objectclass                   : {top, person, organizationalPerson, user...}
lastlogontimestamp            : 4/2/2021 8:36:12 AM
name                          : DC1
objectsid                     : S-1-5-21-501555289-2168925624-2051597760-1000
samaccountname                : DC1$
localpolicyflags              : 0
codepage                      : 0
samaccounttype                : 805306369
whenchanged                   : 4/7/2021 12:30:23 PM
accountexpires                : 9223372036854775807
countrycode                   : 0
adspath                       : LDAP://CN=DC1,OU=Domain Controllers,DC=ignite,DC=local
instancetype                  : 4
msdfsr-computerreferencebl    : CN=DC1,CN=Topology,CN=Domain System Volume,CN=DFSR-GlobalSett
objectguid                    : de681d91-bd3c-45df-8285-c9ceb8eb7c37
operatingsystem               : Windows Server 2016 Standard Evaluation
operatingsystemversion        : 10.0 (14393)
lastlogoff                    : 12/31/1600 4:00:00 PM
objectcategory                : CN=Computer,CN=Schema,CN=Configuration,DC=ignite,DC=local
dscorepropagationdata         : {6/29/2020 4:54:43 PM, 1/1/1601 12:00:01 AM}
serviceprincipalname          : {TERMSRV/DC1, TERMSRV/DC1.ignite.local, Dfsr-12F9A27C-BF97-4
usncreated                    : 12293
memberof                      : CN=RAS and IAS Servers,CN=Users,DC=ignite,DC=local
lastlogon                     : 4/11/2021 3:31:14 AM
badpwdcount                   : 0
cn                            : DC1
useraccountcontrol            : 532480
whencreated                   : 6/29/2020 4:54:43 PM
primarygroupid                : 516
iscriticalsystemobject        : True
msds-supportedencryptiontypes : 28
usnchanged                    : 147496
ridsetreferences              : CN=RID Set,CN=DC1,OU=Domain Controllers,DC=ignite,DC=local
dnshostname                   : DC1.ignite.local

logoncount                    : 8
badpasswordtime               : 12/31/1600 4:00:00 PM
distinguishedname             : CN=CLIENT,CN=Computers,DC=ignite,DC=local
objectclass                   : {top, person, organizationalPerson, user...}
badpwdcount                   : 0
lastlogontimestamp            : 9/23/2020 10:11:02 AM
objectsid                     : S-1-5-21-501555289-2168925624-2051597760-2101
samaccountname                : CLIENT$
localpolicyflags              : 0
```

Moreover, if the attacker decides to use the -OperatingSystem option with the Get-NetComputer and provide the Name of the OS as a parameter then they can extract all the machines that are running that specific Operating System.

```
Get-NetComputer -Operatingsystem "Windows Server 2016 Standard Evaluation"
```

```
PS C:\Users\Administrator\Desktop> Get-NetComputer -Operatingsystem "Windows Server 2016 Standard Evaluation"
DC1.ignite.local
```

Get-UserProperty

Next on the list is the UserProperty. Up until now, the attacker can extract the users and very little information about them. This was limited but this problem is solved using UserProperty. With it, the attacker can aim to those niche details about any particular property. Some of the information extractable is check for Administrator Level Access, Password Time, Password Change Date, Description of the User, check what group the different users are a part of, and much more.

```
Get-UserProperty
```

```
PS C:\Users\Administrator\Desktop> Get-UserProperty

Name
----
accountexpires
admincount
adspath
badpasswordtime
badpwdcount
cn
codepage
countrycode
description
distinguishedname
dscorepropagationdata
instancetype
iscriticalsystemobject
lastlogoff
lastlogon
lastlogontimestamp
logoncount
memberof
name
objectcategory
objectclass
objectguid
objectsid
primarygroupid
pwdlastset
samaccountname
samaccounttype
useraccountcontrol
usnchanged
usncreated
whenchanged
whencreated
```

To target a specific Property, the attacker can use the Properties option and specify the property they want to inquire about. For the demonstration, the property that was inquired here was

badpwdcount. This tells the attacker about the unsuccessful attempts that were made against all the users.

```
Get-UserProperty -Properties badpwdcount
```

```
PS C:\Users\Administrator\Desktop> Get-UserProperty -Properties badpwdcount

name           badpwdcount
----           -----------
Administrator            0
Guest                    0
DefaultAccount           0
krbtgt                   0
yashika                  0
geet                     0
aarti                    0
Raj                      0
pavan                    2
SQL Service              0
jeenali                  0
japneet                  0
ignite                   0
```

The attacker can focus on the logoncount property to get an understanding as to which of the users are dormant and which among them are active. In a real-life scenario, inactive users might be the users in a network of ex-employees that have been overlooked by the Administrator. This can create a problem as firstly these accounts would not adhere to change their password also the attack mounted on these accounts won't raise flags being these users are legit.

```
Get-UserProperty -Properties logoncount
```

```
PS C:\Users\Administrator\Desktop> Get-UserProperty -Properties logoncount

name           logoncount
----           ----------
Administrator          92
Guest                   0
DefaultAccount          0
krbtgt                  0
yashika                60
geet                    1
aarti                   0
Raj                     0
pavan                   0
SQL Service             0
jeenali                 0
japneet                 0
ignite                  0
```

Get-NetForest

Apart from the domain information and the user information, the attacker can also gain information about the forests and there can be multiple forests inside a domain. To procure information about the forest in the current user's domain is to use Get-NetForest.

```
Get-NetForest
```

```
PS C:\Users\Administrator\Desktop> Get-NetForest


RootDomainSid          : S-1-5-21-501555289-2168925624-2051597760
Name                   : ignite.local
Sites                  : {Default-First-Site-Name}
Domains                : {ignite.local}
GlobalCatalogs         : {DC1.ignite.local}
ApplicationPartitions  : {DC=ForestDnsZones,DC=ignite,DC=local, DC=DomainDnsZ
ForestModeLevel        : 7
ForestMode             : Unknown
RootDomain             : ignite.local
Schema                 : CN=Schema,CN=Configuration,DC=ignite,DC=local
SchemaRoleOwner        : DC1.ignite.local
NamingRoleOwner        : DC1.ignite.local
```

Get-NetForestCatalog

```
PS C:\Users\Administrator\Desktop> Get-NetForestCatalog


Forest                     : ignite.local
CurrentTime                : 4/11/2021 10:59:26 AM
HighestCommittedUsn        : 213067
OSVersion                  : Windows Server 2016 Standard Evaluation
Roles                      : {SchemaRole, NamingRole, PdcRole, RidRole...}
Domain                     : ignite.local
IPAddress                  : ::1
SiteName                   : Default-First-Site-Name
SyncFromAllServersCallback :
InboundConnections         : {}
OutboundConnections        : {}
Name                       : DC1.ignite.local
Partitions                 : {DC=ignite,DC=local, CN=Configuration,DC=ignite,DC=local,
```

Forests typically have different global catalogs that can help the attacker to get some precarious information about the domain. This can be observed from the following demonstration of extracting all the global catalogs of the current forest using the Get-NetForestCatalog.

Get-NetForestCatalog

```
PS C:\Users\Administrator\Desktop> Get-NetForestDomain


Forest                     : ignite.local
DomainControllers          : {DC1.ignite.local}
Children                   : {}
DomainMode                 : Unknown
DomainModeLevel            : 7
Parent                     :
PdcRoleOwner               : DC1.ignite.local
RidRoleOwner               : DC1.ignite.local
InfrastructureRoleOwner    : DC1.ignite.local
Name                       : ignite.local
```

Get-NetForestDomain

Moving on from the catalogs, the attacker can also work on extracting the various domains of the forest the current user is located in. This can be done by running Get-NetForestDomain as shown in the demonstration.

```
Get-NetForestDomain
```

```
PS C:\Users\Administrator\Desktop> Get-NetForestDomain


Forest                  : ignite.local
DomainControllers       : {DC1.ignite.local}
Children                : {}
DomainMode              : Unknown
DomainModeLevel         : 7
Parent                  :
PdcRoleOwner            : DC1.ignite.local
RidRoleOwner            : DC1.ignite.local
InfrastructureRoleOwner : DC1.ignite.local
Name                    : ignite.local
```

Get-NetLoggedon

That's enough Forest, getting back to the users on the local or remote machine the attacker can take advantage of the NetLoggedon module. Administrative Rights are required to use this module. This module uses the NetWkstaUserEnum Win32API call to extract the users currently logged on. If the attacker is in a bit of a hurry, they can enumerate all the users logged on to all the machines in the domain by first running Get-DomainComputer and then using Get-NetLoggedon on that data. They can concatenate this using a pipe.

```
Get-DomainComputer | Get-NetLoggedon
```

In this demonstration, however, it is shown how to enumerate users that are loggedon on a particular machine with the help of the ComputerName option and providing the Name.

```
Get-NetLoggedon -ComputerName DC1
```

```
PS C:\Users\Administrator\Desktop> Get-NetLoggedon -ComputerName DC1

wkui1_username wkui1_logon_domain wkui1_oth_domains wkui1_logon_server
-------------- ----------------- ---------------- ------------------
DC1$           IGNITE
Administrator  IGNITE                              DC1
DC1$           IGNITE
DC1$           IGNITE
DC1$           IGNITE
```

Get-DomainPolicy

The Get-DomainPolicy command in PowerView is used to retrieve the default domain policy and domain controller policy settings in an Active Directory (AD) environment. This includes password policies, lockout policies, and Kerberos settings—crucial for both attackers and defenders.

```
Get-DomainPolicy
```

```
PS C:\Users\Administrator\Desktop> Get-DomainPolicy

Unicode        : @{Unicode=yes}
SystemAccess   : @{MinimumPasswordAge=1; MaximumPasswordAge=42; LockoutBadCount=0; PasswordComplexity=1;
                 MinimumPasswordLength=7}
RegistryValues : @{MACHINE\System\CurrentControlSet\Control\Lsa\NoLMHash=System.String[]}
KerberosPolicy : @{MaxTicketAge=10; MaxServiceAge=600; MaxClockSkew=5; MaxRenewAge=7; TicketValidateClier
Version        : @{Revision=1; signature="$CHICAGO$"}
```

To enumerate Kerberos details, the attacker can try and go after the Kerberos Policy which contains data such as the Max Ticket Age, Max Renew Age, and several Ticket Validation Client. This kind of information can come in handy if the attacker is trying to perform a ticket forging attack or similar attack.

```
(Get-DomainPolicy)."KerberosPolicy"
```

```
PS C:\Users\Administrator\Desktop> (Get-DomainPolicy)."KerberosPolicy"

MaxTicketAge        : 10
MaxServiceAge       : 600
MaxClockSkew        : 5
MaxRenewAge         : 7
TicketValidateClient : 1
```

Parameters

- -Domain <domain> — Specify a different domain to query.
- -LDAPFilter — Apply custom LDAP filtering if needed.
- -Server <domain controller> — Target a specific domain controller.

Returns the password and lockout policy portion of the domain policy.

```
(Get-DomainPolicy)."SystemAccess"
```

```
PS C:\Users\Administrator\Desktop> (Get-DomainPolicy)."SystemAccess"

MinimumPasswordAge          : 1
MaximumPasswordAge          : 42
LockoutBadCount             : 0
PasswordComplexity          : 1
RequireLogonToChangePassword : 0
LSAAnonymousNameLookup      : 0
ForceLogoffWhenHourExpire   : 0
PasswordHistorySize         : 3
ClearTextPassword           : 0
MinimumPasswordLength       : 7
```

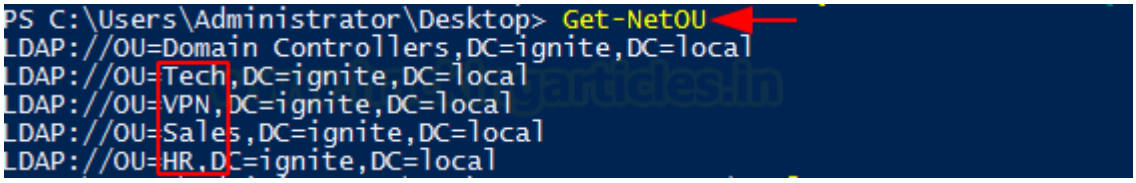
Get-NetOU

Attackers use the Get-NetOU command in PowerView to enumerate Organizational Units (OUs) in an Active Directory (AD) environment. Organizational Units are containers within AD used to group users, computers, and other objects—often by department, location, or role.

To Enumerate, run the following command on PowerShell.

```
Get-NetOU
```

This lists all OUs in the current domain.



It can be observed that there are 4 OUs on the Target Server. Namely, Tech, VPN, Sales, and HR.

Get-NetGroup

The Get-NetGroup command in PowerView is used to enumerate groups in an Active Directory (AD) environment. It's a key recon tool for both Red Teamers and Blue Teamers to discover group-based privileges and access controls.

```
Get-NetGroup
```

This retrieves a list of all groups in the current domain.

```
PS C:\Users\Administrator\Desktop> Get-NetGroup
Administrators
Users
Guests
Print Operators
Backup Operators
Replicator
Remote Desktop Users
Network Configuration Operators
Performance Monitor Users
Performance Log Users
Distributed COM Users
IIS_IUSRS
Cryptographic Operators
Event Log Readers
Certificate Service DCOM Access
RDS Remote Access Servers
RDS Endpoint Servers
RDS Management Servers
Hyper-V Administrators
Access Control Assistance Operators
Remote Management Users
System Managed Accounts Group
Storage Replica Administrators
Domain Computers
Domain Controllers
Schema Admins
Enterprise Admins
Cert Publishers
Domain Admins
Domain Users
Domain Guests
Group Policy Creator Owners
RAS and IAS Servers
Server Operators
Account Operators
Pre-Windows 2000 Compatible Access
Incoming Forest Trust Builders
Windows Authorization Access Group
Terminal Server License Servers
Allowed RODC Password Replication Group
Denied RODC Password Replication Group
Read-only Domain Controllers
Enterprise Read-only Domain Controllers
Cloneable Domain Controllers
Protected Users
Key Admins
Enterprise Key Admins
DnsAdmins
DnsUpdateProxy
Finance
```

Parameters

- -GroupName <name> — Search for a specific group by name.
- -Domain <domain> — Query a different domain.
- -FullData — Get all LDAP attributes for each group.
- -SearchBase <OU DN> — Limit search to a specific Organizational Unit.

Extracting and Targeting Group Information

When the attacker wants to extract groups that include the keyword “admin,” they use it to find relevant administrator-related groups. These groups might be important or contain sensitive information.

```
Get-NetGroup *admin*
```

```
PS C:\Users\Administrator\Desktop> Get-NetGroup *admin*
Administrators
Hyper-V Administrators
Storage Replica Administrators
Schema Admins
Enterprise Admins
Domain Admins
Key Admins
Enterprise Key Admins
DnsAdmins
```

Suppose the attacker wants to check the group membership of a specific user. Then they can use the UserName option to do so, as shown in the example. The attacker extracts information for the Yashika user:

```
Get-NetGroup -UserName yashika
```

```
PS C:\Users\Administrator\Desktop> Get-NetGroup -UserName yashika
BUILTIN\Administrators
IGNITE\Denied RODC Password Replication Group
IGNITE\Domain Admins
```

To target a specific domain, the attacker can use the Domain option along with the domain name provided:

```
Get-NetGroup -Domain ignite.local
```

```
PS C:\Users\Administrator\Desktop> Get-NetGroup -Domain ignite.local
Administrators
Users
Guests
Print Operators
Backup Operators
Replicator
Remote Desktop Users
Network Configuration Operators
Performance Monitor Users
Performance Log Users
Distributed COM Users
IIS_IUSRS
Cryptographic Operators
Event Log Readers
Certificate Service DCOM Access
RDS Remote Access Servers
RDS Endpoint Servers
RDS Management Servers
Hyper-V Administrators
Access Control Assistance Operators
Remote Management Users
System Managed Accounts Group
Storage Replica Administrators
Domain Computers
Domain Controllers
Schema Admins
Enterprise Admins
Cert Publishers
Domain Admins
Domain Users
Domain Guests
Group Policy Creator Owners
RAS and IAS Servers
Server Operators
Account Operators
Pre-Windows 2000 Compatible Access
Incoming Forest Trust Builders
Windows Authorization Access Group
Terminal Server License Servers
Allowed RODC Password Replication Group
Denied RODC Password Replication Group
Read-only Domain Controllers
Enterprise Read-only Domain Controllers
Cloneable Domain Controllers
Protected Users
Key Admins
```

Detailed Group Enumeration and Filters

Furthermore, if the attacker wants to extract all data about groups in the domain, they use the FullData option. It helps extract all users with their group details. In the demonstration, it is observed that an Admin exists in the domain and is a member of the Administrator Group along with other User Groups.

```
Get-NetGroup -FullData
```

```
PS C:\Users\Administrator\Desktop> Get-NetGroup -FullData


grouptype               : -2147483643
admincount              : 1
iscriticalsystemobject  : True
samaccounttype          : 536870912
samaccountname          : Administrators
whenchanged             : 7/6/2020 5:39:37 PM
objectsid               : S-1-5-32-544
objectclass             : {top, group}
cn                      : Administrators
usnchanged              : 20539
systemflags             : -1946157056
name                    : Administrators
adspath                 : LDAP://CN=Administrators,CN=Builtin,DC=ignite,DC=l
dscorepropagationdata   : {7/6/2020 5:39:37 PM, 6/29/2020 4:54:43 PM, 1/1/16
description             : Administrators have complete and unrestricted acce
distinguishedname       : CN=Administrators,CN=Builtin,DC=ignite,DC=local
member                  : {CN=Domain Admins,CN=Users,DC=ignite,DC=local, CN=
usncreated              : 8200
whencreated             : 6/29/2020 4:54:05 PM
instancetype            : 4
objectguid              : c9afd4ac-f09c-4596-a41e-b69465439363
objectcategory          : CN=Group,CN=Schema,CN=Configuration,DC=ignite,DC=l

grouptype               : -2147483643
systemflags             : -1946157056
iscriticalsystemobject  : True
samaccounttype          : 536870912
samaccountname          : Users
whenchanged             : 6/29/2020 4:54:43 PM
objectsid               : S-1-5-32-545
objectclass             : {top, group}
cn                      : Users
usnchanged              : 12381
dscorepropagationdata   : {6/29/2020 4:54:43 PM, 1/1/1601 12:00:01 AM}
name                    : Users
adspath                 : LDAP://CN=Users,CN=Builtin,DC=ignite,DC=local
description             : Users are prevented from making accidental or inte
distinguishedname       : CN=Users,CN=Builtin,DC=ignite,DC=local
member                  : {CN=Domain Users,CN=Users,DC=ignite,DC=local, CN=S
usncreated              : 8203
whencreated             : 6/29/2020 4:54:05 PM
instancetype            : 4
objectguid              : 895d6d29-db2a-4ca2-9eae-9e1b226e5774
objectcategory          : CN=Group,CN=Schema,CN=Configuration,DC=ignite,DC=l
```

There is a member named Japneet who is part of the Tech Group. When the attacker looks for more information about group users, they observe that a user named Geet also belongs to the Tech Group.

```
grouptype               : -2147483643
admincount              : 1
iscriticalsystemobject  : True
samaccounttype          : 536870912
samaccountname          : Print Operators
whenchanged             : 4/7/2021 1:45:55 PM
objectsid               : S-1-5-32-550
objectclass             : {top, group}
cn                      : Print Operators
usnchanged              : 151629
systemflags             : -1946157056
name                    : Print Operators
adspath                 : LDAP://CN=Print Operators,CN=Builtin,DC=ignite,DC=local
dscorepropagationdata   : {7/6/2020 5:39:37 PM, 6/29/2020 4:54:43 PM, 1/1/1601 12:04:16 A
description             : Members can administer printers installed on domain controllers
distinguishedname       : CN=Print Operators,CN=Builtin,DC=ignite,DC=local
member                  : CN=japneet,OU=Tech,DC=ignite,DC=local
usncreated              : 8212
whencreated             : 6/29/2020 4:54:05 PM
instancetype            : 4
objectguid              : 2cda2d0f-0716-44dd-8ea8-1447d8da4ec6
objectcategory          : CN=Group,CN=Schema,CN=Configuration,DC=ignite,DC=local

grouptype               : -2147483643
admincount              : 1
iscriticalsystemobject  : True
samaccounttype          : 536870912
samaccountname          : Backup Operators
whenchanged             : 4/9/2021 5:30:20 PM
objectsid               : S-1-5-32-551
objectclass             : {top, group}
cn                      : Backup Operators
usnchanged              : 192583
systemflags             : -1946157056
name                    : Backup Operators
adspath                 : LDAP://CN=Backup Operators,CN=Builtin,DC=ignite,DC=local
dscorepropagationdata   : {7/6/2020 5:39:37 PM, 6/29/2020 4:54:43 PM, 1/1/1601 12:04:16 A
description             : Backup Operators can override security restrictions for the sol
distinguishedname       : CN=Backup Operators,CN=Builtin,DC=ignite,DC=local
member                  : {CN=ignite,OU=Tech,DC=ignite,DC=local, CN=geet,OU=Tech,DC=ignit
usncreated              : 8213
whencreated             : 6/29/2020 4:54:05 PM
instancetype            : 4
objectguid              : f2d07966-5803-493b-b7ef-3b77edc0fe15
objectcategory          : CN=Group,CN=Schema,CN=Configuration,DC=ignite,DC=local
```

Next, the attacker moves from user-based group enumeration to group-based enumeration by providing a specific group name:

```
Get-NetGroup "Domain Admins"
```

```
PS C:\Users\Administrator\Desktop> Get-NetGroup "Domain Admins"
Domain Admins
```

They can also combine multiple options to enumerate detailed data about a group:

```
Get-NetGroup "Domain Admins" -FullData
```

```
PS C:\Users\Administrator\Desktop> Get-NetGroup "Domain Admins" -FullData


grouptype               : -2147483646
admincount              : 1
iscriticalsystemobject  : True
samaccounttype          : 268435456
samaccountname          : Domain Admins
whenchanged             : 4/7/2021 1:42:38 PM
objectsid               : S-1-5-21-501555289-2168925624-2051597760-512
objectclass             : {top, group}
cn                      : Domain Admins
usnchanged              : 151621
dscorepropagationdata   : {7/6/2020 5:39:37 PM, 6/29/2020 4:54:43 PM, 1/1/1601 12:04:16 AM}
memberof                : {CN=Denied RODC Password Replication Group,CN=Users,DC=ignite,DC=local,
                          CN=Administrators,CN=Builtin,DC=ignite,DC=local}
adspath                 : LDAP://CN=Domain Admins,CN=Users,DC=ignite,DC=local
description             : Designated administrators of the domain
distinguishedname       : CN=Domain Admins,CN=Users,DC=ignite,DC=local
name                    : Domain Admins
member                  : {CN=yashika,OU=Tech,DC=ignite,DC=local, CN=Administrator,CN=Users,DC=ignit
usncreated              : 12345
whencreated             : 6/29/2020 4:54:43 PM
instancetype            : 4
objectguid              : 794d6fc1-b2e0-4462-bcf7-04d6ba921801
objectcategory          : CN=Group,CN=Schema,CN=Configuration,DC=ignite,DC=local
```

Finally, the attacker can streamline enumeration by combining several options. This includes specifying a particular group name and domain.

```
Get-NetGroup -GroupName *admin* -Domain ignite.local
```

```
PS C:\Users\Administrator\Desktop> Get-NetGroup -GroupName *admin* -Domain ignite.local
Administrators
Hyper-V Administrators
Storage Replica Administrators
Schema Admins
Enterprise Admins
Domain Admins
Key Admins
Enterprise Key Admins
DnsAdmins
```

Get-NetGroupMember

In the enumeration, if the attacker gets to a stage where they have successfully enumerated the group names then they can use that in collaboration with the Get-NetGroupMember to extract the members of that group. In the demonstration, we extracted the members of the group Domain Admins.

```
Get-NetGroupMember -GroupName "Domain Admins"
```

```
PS C:\Users\Administrator\Desktop> Get-NetGroupMember -GroupName "Domain Admins"

GroupDomain   : ignite.local
GroupName     : Domain Admins
MemberDomain  : ignite.local
MemberName    : yashika
MemberSid     : S-1-5-21-501555289-2168925624-2051597760-1103
IsGroup       : False
MemberDN      : CN=yashika,OU=Tech,DC=ignite,DC=local

GroupDomain   : ignite.local
GroupName     : Domain Admins
MemberDomain  : ignite.local
MemberName    : Administrator
MemberSid     : S-1-5-21-501555289-2168925624-2051597760-500
IsGroup       : False
MemberDN      : CN=Administrator,CN=Users,DC=ignite,DC=local
```

As discussed earlier Get-NetGroupMember also supports some options to run along such as the Recurse. It helps the attacker extracts significant amounts of data about all the users of the group they provided. As it can be observed from the screenshots of running Get-NetGroupMember with and without Recurse there is some significant difference between them both.

```
Get-NetGroupMember -GroupName "Administrators" -Recurse
```

```
PS C:\Users\Administrator\Desktop> Get-NetGroupMember -GroupName 'Administrators' -Recurse

GroupDomain   : ignite.local
GroupName     : Administrators
MemberDomain  : ignite.local
MemberName    : Domain Admins
MemberSid     : S-1-5-21-501555289-2168925624-2051597760-512
IsGroup       : True
MemberDN      : CN=Domain Admins,CN=Users,DC=ignite,DC=local

Cannot index into a null array. :
logonCount                      : 64
badPasswordTime                 : 4/7/2021 7:12:41 AM
description                     : pass Password@1
distinguishedName               : CN=yashika,OU=Tech,DC=ignite,DC=local
objectClass                     : {top, person, organizationalPerson, user}
displayName                     : yashika
lastLogonTimestamp              : 4/7/2021 7:12:47 AM
userPrincipalName               : yashika@ignite.local
objectSid                       : S-1-5-21-501555289-2168925624-2051597760-1103
adminCount                      : 1
codePage                        : 0
sAMAccountType                  : 805306368
countryCode                     : 0
whenChanged                     : 4/10/2021 2:08:59 PM
instanceType                    : 4
objectGUID                      : d2ff2fb0-5f92-471b-b94c-a1bc5be262f2
lastLogoff                      : 12/31/1600 4:00:00 PM
sAMAccountName                  : yashika
objectCategory                  : CN=Person,CN=Schema,CN=Configuration,DC=ignite,DC=local
dSCorePropagationData           : {3/26/2021 6:37:49 PM, 1/1/1601 12:00:00 AM}
givenName                       : yashika
memberOf                        : CN=Domain Admins,CN=Users,DC=ignite,DC=local
lastLogon                       : 4/11/2021 4:02:06 AM
badPwdCount                     : 0
cn                              : yashika
userAccountControl              : 66048
whenCreated                     : 6/29/2020 5:08:49 PM
primaryGroupID                  : 513
pwdLastSet                      : 6/29/2020 10:08:49 AM
name                            : yashika
GroupDomain                     : ignite.local
GroupName                       : Domain Admins
MemberDomain                    : ignite.local
MemberName                      : yashika
MemberSid                       : S-1-5-21-501555289-2168925624-2051597760-1103
IsGroup                         : False
MemberDN                        : CN=yashika,OU=Tech,DC=ignite,DC=local
```

Get-NetGPO

Group Policy provides an interesting way to figure out how the Domain is set up and what set of rules and policies the Administrator has designed to govern the Domain. You can enumerate this using Get-NetGPO. This command extracts all the information regarding Group Policies configured on the Target System.

```
Get-NetGPO
```

```
PS C:\Users\Administrator\Desktop> Get-NetGPO


usncreated               : 5900
systemflags              : -1946157056
displayname              : Default Domain Policy
gpcmachineextensionnames : [{35378EAC-683F-11D2-A89A-00C04FBBCFA2}{53D6AB1B-2488-11D1-A28
                           -11D1-A28C-00C04FB94F17}]
whenchanged              : 4/8/2021 1:58:58 PM
objectclass              : {top, container, groupPolicyContainer}
gpcfunctionalityversion  : 2
showinadvancedviewonly   : True
usnchanged               : 163911
dscorepropagationdata    : {6/29/2020 4:54:43 PM, 1/1/1601 12:00:00 AM}
name                     : {31B2F340-016D-11D2-945F-00C04FB984F9}
adspath                  : LDAP://CN={31B2F340-016D-11D2-945F-00C04FB984F9},CN=Policies,C
flags                    : 0
cn                       : {31B2F340-016D-11D2-945F-00C04FB984F9}
iscriticalsystemobject   : True
gpcfilesyspath           : \\ignite.local\sysvol\ignite.local\Policies\{31B2F340-016D-11D
distinguishedname        : CN={31B2F340-016D-11D2-945F-00C04FB984F9},CN=Policies,CN=Syste
whencreated              : 6/29/2020 4:54:05 PM
versionnumber            : 7
instancetype             : 4
objectguid               : 4aaf7089-5629-4f93-b6cc-0ecc1c4dba1e
objectcategory           : CN=Group-Policy-Container,CN=Schema,CN=Configuration,DC=ignite

usncreated               : 5903
systemflags              : -1946157056
displayname              : Default Domain Controllers Policy
gpcmachineextensionnames : [{35378EAC-683F-11D2-A89A-00C04FBBCFA2}{D02B1F72-3407-48AE-BA8
whenchanged              : 4/7/2021 4:46:25 PM
objectclass              : {top, container, groupPolicyContainer}
gpcfunctionalityversion  : 2
showinadvancedviewonly   : True
usnchanged               : 155719
dscorepropagationdata    : {6/29/2020 4:54:43 PM, 1/1/1601 12:00:00 AM}
name                     : {6AC1786C-016F-11D2-945F-00C04fB984F9}
adspath                  : LDAP://CN={6AC1786C-016F-11D2-945F-00C04fB984F9},CN=Policies,C
flags                    : 0
cn                       : {6AC1786C-016F-11D2-945F-00C04fB984F9}
iscriticalsystemobject   : True
gpcfilesyspath           : \\ignite.local\sysvol\ignite.local\Policies\{6AC1786C-016F-11D
distinguishedname        : CN={6AC1786C-016F-11D2-945F-00C04fB984F9},CN=Policies,CN=Syste
whencreated              : 6/29/2020 4:54:05 PM
versionnumber            : 6
instancetype             : 4
objectguid               : f852ef84-af95-4083-ba7c-8eabfa710587
```

As you can observe from the previous iteration of running Get-NetGPO, the amount of information can be overwhelming. Hence, to get a clean and easy-to-understand output, you can use selection to retrieve specific names of the policies.

```
Get-NetGPO | select displayname
```

```
PS C:\Users\Administrator\Desktop> Get-NetGPO | select displayname

displayname

Default Domain Policy
Default Domain Controllers Policy
New Group Policy Object
```

Find-GPOLocation

Getting the GPO location is a good way to map the abilities of a specific user. It takes the username that is provided to it and checks for the permissions for that users. This means that it will return the locations that are accessible for that user. In this demonstration, we use the Yashika user and we choose the verbose option as well to elaborate the result to get the most out of it.

```
Find-GPOLocation -UserName yashika -verbose
```

```
PS C:\Users\Administrator\Desktop> Find-GPOLocation -UserName yashika -verbose
VERBOSE: Get-DomainSearcher search string: LDAP://DC=ignite,DC=local
VERBOSE: LocalSid: S-1-5-32-544
VERBOSE: TargetSid: S-1-5-21-501555289-2168925624-2051597760-1103
VERBOSE: TargetObjectDistName: CN=yashika,OU=Tech,DC=ignite,DC=local
VERBOSE: Get-DomainSearcher search string: LDAP://DC=ignite,DC=local
VERBOSE: Get-DomainSearcher search string: LDAP://DC=ignite,DC=local
VERBOSE: Effective target sids: S-1-5-21-501555289-2168925624-2051597760-1103 S-1-5-32-544 S-1-5-21-501555289-2168925624-20515
VERBOSE: Get-DomainSearcher search string: LDAP://DC=ignite,DC=local
VERBOSE: Parsing \\ignite.local\sysvol\ignite.local\Policies\{31B2F340-016D-11D2-945F-00C04FB984F9}\MACHINE\Microsoft\Windows
VERBOSE: Parsing \\ignite.local\sysvol\ignite.local\Policies\{6AC1786C-016F-11D2-945F-00C04fB984F9}\MACHINE\Microsoft\Windows
VERBOSE: Parsing \\ignite.local\SysVol\ignite.local\Policies\{46A4D008-D193-4F79-8B62-0B657A945A33}\MACHINE\Microsoft\Windows
VERBOSE: GPOgroups:
```

Invoke-EnumerateLocalAdmin

Invoke-EnumerateLocalAdmin does exactly what the names say. It searched for the Local Administrators for the domain. In our demonstration, we see that we have extracted the Administrator, Enterprise Admins and Domain Admins for our domain ignite. local.

```
Invoke-EnumerateLocalAdmin
```

```
PS C:\Users\Administrator\Desktop> Invoke-EnumerateLocalAdmin


Server        : DC1.ignite.local
AccountName   : ignite.local/Administrator
SID           : S-1-5-21-501555289-2168925624-2051597760-500
Disabled      : False
IsGroup       : False
IsDomain      : True
LastLogin     : 4/11/2021 5:05:03 AM

Server        : DC1.ignite.local
AccountName   : ignite.local/Enterprise Admins
SID           : S-1-5-21-501555289-2168925624-2051597760-519
Disabled      : False
IsGroup       : True
IsDomain      : True
LastLogin     :

Server        : DC1.ignite.local
AccountName   : ignite.local/Domain Admins
SID           : S-1-5-21-501555289-2168925624-2051597760-512
Disabled      : False
IsGroup       : True
IsDomain      : True
LastLogin     :
```

Get-NetProcess

The Get-NetProcess command in PowerView is used to enumerate running processes on remote systems in an Active Directory environment. It's especially useful during post-exploitation when an attacker wants to identify processes like antivirus tools, command shells, or credential managers running on target machines.

```
Get-NetProcess
```

```
PS C:\Users\Administrator\Desktop> Get-NetProcess

ComputerName : DC1
ProcessName  : System Idle Process
ProcessID    : 0
Domain       :
User         :

ComputerName : DC1
ProcessName  : System
ProcessID    : 4
Domain       :
User         :

ComputerName : DC1
ProcessName  : smss.exe
ProcessID    : 324
Domain       : NT AUTHORITY
User         : SYSTEM

ComputerName : DC1
ProcessName  : csrss.exe
ProcessID    : 452
Domain       : NT AUTHORITY
User         : SYSTEM

ComputerName : DC1
ProcessName  : wininit.exe
ProcessID    : 564
Domain       : NT AUTHORITY
User         : SYSTEM

ComputerName : DC1
ProcessName  : csrss.exe
ProcessID    : 572
Domain       : NT AUTHORITY
User         : SYSTEM

ComputerName : DC1
ProcessName  : winlogon.exe
ProcessID    : 656
Domain       : NT AUTHORITY
User         : SYSTEM
```

Invoke-ShareFinder

Any inexperienced attacker might wonder why there is a need to enumerate the shares when they can do that externally using SMB enumeration. But an experienced attacker knows that some shares are not visible to all users. The system can configure whether a particular share is visible and accessible to everyone or only to specific users. Therefore, to enumerate the shares in a domain, use Invoke-ShareFinder.

```
Invoke-ShareFinder
```

```
PS C:\Users\Administrator\Desktop> Invoke-ShareFinder
\\DC1.ignite.local\ADMIN$        - Remote Admin
\\DC1.ignite.local\C$    - Default share
\\DC1.ignite.local\Confidential          -
\\DC1.ignite.local\IPC$          - Remote IPC
\\DC1.ignite.local\NETLOGON      - Logon server share
\\DC1.ignite.local\Sales Report          -
\\DC1.ignite.local\SYSVOL        - Logon server share
\\DC1.ignite.local\Users         -
```

Invoke-FileFinder

Searching on the machine that the attacker has an initial foothold is not that difficult task. But to search a specific file across the network in the domain can be done using the Invoke FileFinder. It will search for sensitive files such as the Credentials files and other files that can lead to a serious compromise.

```
Invoke-FileFinder
```

```
PS C:\Users\Administrator\Desktop> Invoke-FileFinder


FullName        : \\DC1.ignite.local\Users\Administrator
Owner           : NT AUTHORITY\SYSTEM
LastAccessTime  : 4/10/2021 8:01:42 AM
LastWriteTime   : 4/10/2021 8:01:42 AM
CreationTime    : 6/29/2020 9:40:36 AM
Length          :

FullName        : \\DC1.ignite.local\Users\Administrator\AppData\Local\Microsoft\Credentials
Owner           : BUILTIN\Administrators
LastAccessTime  : 3/6/2021 8:12:12 AM
LastWriteTime   : 3/6/2021 8:12:12 AM
CreationTime    : 6/29/2020 9:40:37 AM
Length          :

FullName        : \\DC1.ignite.local\Users\Administrator\AppData\Local\Microsoft_Corporation\
Owner           : BUILTIN\Administrators
LastAccessTime  : 4/11/2021 4:40:14 AM
LastWriteTime   : 4/11/2021 4:40:14 AM
CreationTime    : 6/29/2020 9:41:09 AM
Length          : 152966

FullName        : \\DC1.ignite.local\Users\Administrator\AppData\Local\Packages\windows.immer
Owner           : BUILTIN\Administrators
LastAccessTime  : 6/29/2020 9:40:54 AM
LastWriteTime   : 7/16/2016 6:18:57 AM
CreationTime    : 6/29/2020 9:40:54 AM
Length          : 1309
```

Invoke-ACLScanner

ACL or Access Control Lists can be scanned on a domain that will return the weak permissions on the files. Bear in mind that Domain Permission can be a bit challenging to wrap your head around and the permission that you might find using Invoke-ACLScanner can be difficult to exploit. However, this does not mean that any attacker should not check for those. In simpler terms, Invoke-ACLScanner finds the permissions that the users and group have which are possible subject to exploitation. It determines this by separating the default permission and showing the list of permissions that do not default or new defined by the Administrator.

```
Invoke-ACLScanner -ResolveGUIDs
```

```
PS C:\Users\Administrator\Desktop> Invoke-ACLScanner -ResolveGUIDs


InheritedObjectType   : All
ObjectDN              : CN=MicrosoftDNS,CN=System,DC=ignite,DC=local
ObjectType            : All
IdentityReference     : IGNITE\DnsAdmins
IsInherited           : False
ActiveDirectoryRights : CreateChild, DeleteChild, ListChildren, ReadProperty, DeleteTree, ExtendedR
PropagationFlags      : None
ObjectFlags           : None
InheritanceFlags      : ContainerInherit
InheritanceType       : All
AccessControlType     : Allow
ObjectSID             :
IdentitySID           : S-1-5-21-501555289-2168925624-2051597760-1101

InheritedObjectType   : All
ObjectDN              : DC=RootDNSServers,CN=MicrosoftDNS,CN=System,DC=ignite,DC=local
ObjectType            : All
IdentityReference     : IGNITE\DnsAdmins
IsInherited           : True
ActiveDirectoryRights : CreateChild, DeleteChild, ListChildren, ReadProperty, DeleteTree, ExtendedR
PropagationFlags      : None
ObjectFlags           : None
InheritanceFlags      : ContainerInherit
InheritanceType       : All
AccessControlType     : Allow
ObjectSID             :
IdentitySID           : S-1-5-21-501555289-2168925624-2051597760-1101

InheritedObjectType   : All
ObjectDN              : DC=@,DC=RootDNSServers,CN=MicrosoftDNS,CN=System,DC=ignite,DC=local
ObjectType            : All
IdentityReference     : IGNITE\DnsAdmins
IsInherited           : True
ActiveDirectoryRights : CreateChild, DeleteChild, ListChildren, ReadProperty, DeleteTree, ExtendedR
PropagationFlags      : None
ObjectFlags           : None
InheritanceFlags      : ContainerInherit
InheritanceType       : All
AccessControlType     : Allow
ObjectSID             :
IdentitySID           : S-1-5-21-501555289-2168925624-2051597760-1101
```

Find-LocalAdminAccess

Find-LocalAdminAccess also is pretty self-defined. It enumerated for machines on the local domain that have the users who have the local administrator access. It checks if the user has local administrator access using Test-AdminAccess. Then it checks for the Credential option. If passed, then it uses Invoke-UserImpersonation to impersonate the specified user before enumeration.

```
Find-LocalAdminAccess
```

```
PS C:\Users\Administrator\Desktop> Find-LocalAdminAccess
DC1.ignite.local
```

Get-NetSession

At last, it's time to shine some light on the sessions generated inside a Domain. Attackers can enumerate these sessions with the help of the Get-NetSession tool. When they run this command, they extract session information for the local or a remote machine. This function executes the NetSessionEnum Win32API call to extract the session information. They can use it in its bare form, as demonstrated, or use it with the ComputerName option to target a specific host.

```
Get-NetSession
```

```
PS C:\Users\Administrator\Desktop> Get-NetSession

sesi10_cname sesi10_username sesi10_time sesi10_idle_time
------------ --------------- ---------- ----------------
\\[::1]      Administrator            0                0
```

Conclusion

Active Directory is extensive and can be confusing for novice security professionals. In this guide, we will explore how to perform Active Directory enumeration using PowerView, a powerful tool within PowerShell. PowerView enables penetration testers and security professionals to gather crucial information about an Active Directory environment, aiding in post-exploitation and lateral movement. This resource will help you enumerate your Active Directory Deployment and understand the information that an attacker can extract.

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