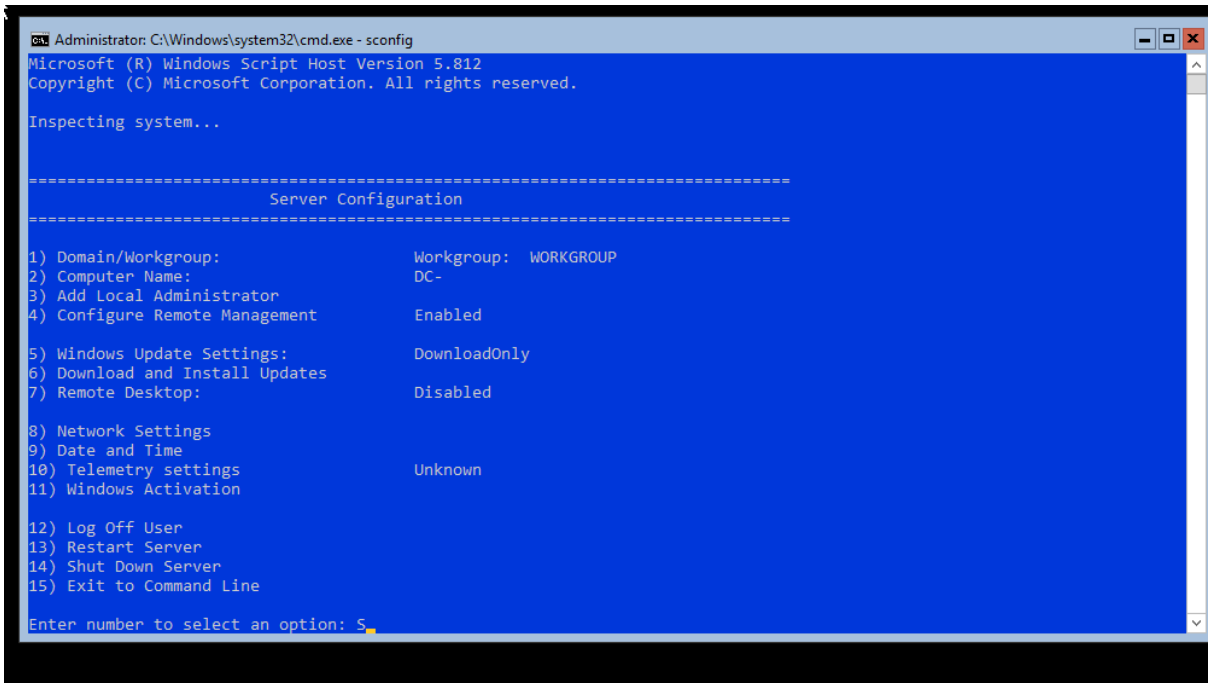
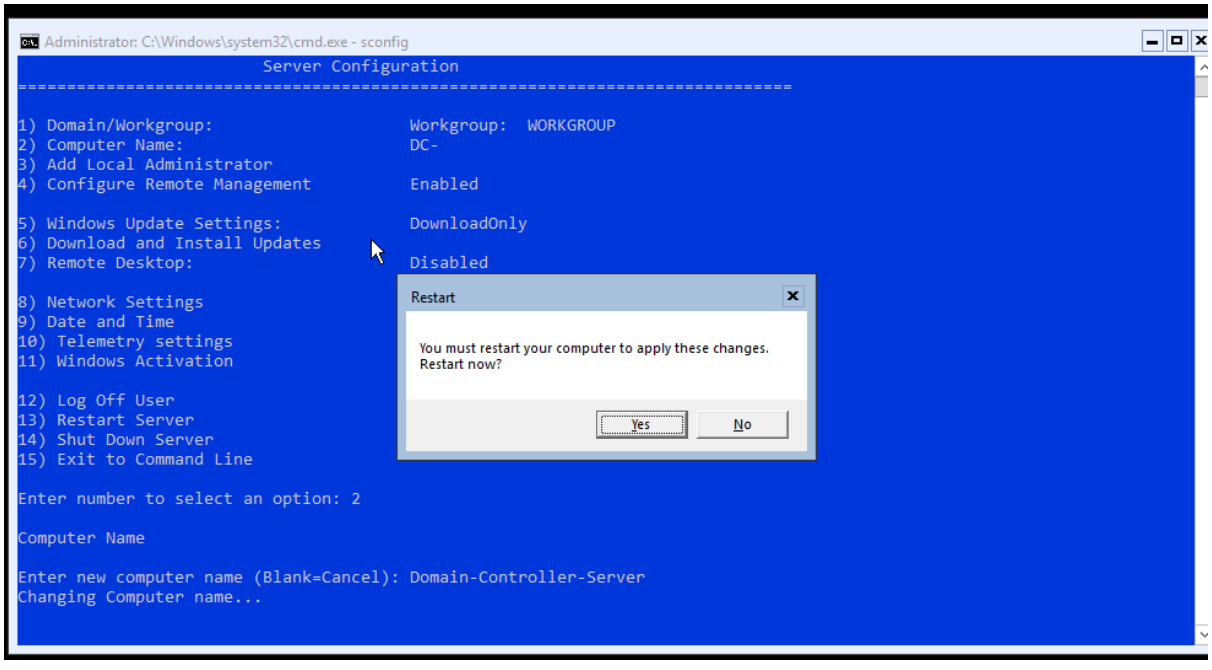
Windows Server From Nothing

Edition 1

Upon installing the Windows Server 2019 ISO from Microsoft, I've used ***sconfig*** and opened the server configuration menu.

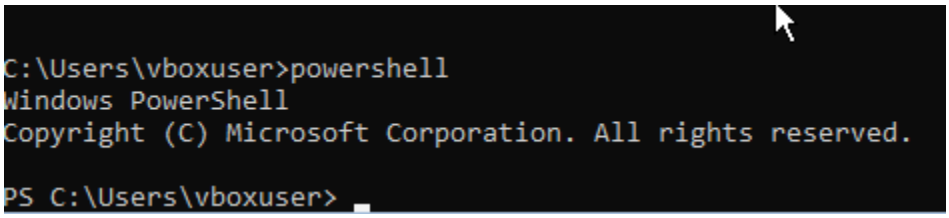


It looks simple in theory but makes me feel like a genius. I have started tinkering with the settings and changed the computer name too.

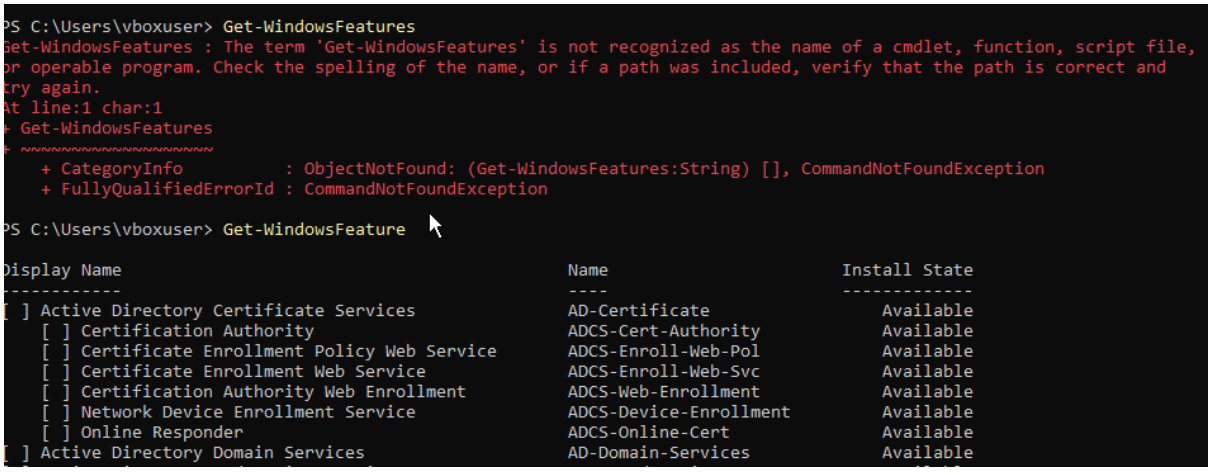


I realised, more or less after installing it, that this is the Windows Server *Core*, and not the desktop experience. I did some online research, and learned that it should, in theory, be possible to administer active directory through the command line interface alone. It should be a fun challenge, most definitely difficult, but I should learn a great deal.

I have gotten to the PowerShell interface by simply typing ***powershell*** into the command module, which makes it easy.



AI suggests that I install Active Directory Domain Services now using some cryptic powershell command, but since I do not know how to use that command yet, I've used the ***Get*** command to understand what features I can actually add to the Windows Server. This'll make it handy since it is basically a catalogue of all windows features that I might ever need in administering or developing this Domain Controller.



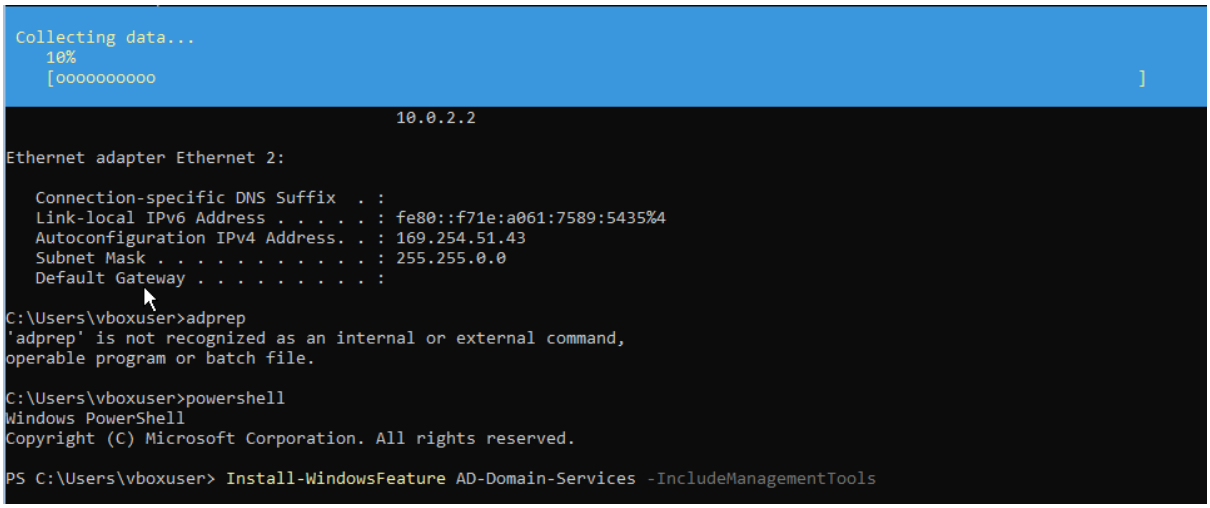
By the way, what is a domain controller anyway? It always sounded so fancy and authoritative whenever I heard it. Here's a nice online source that talks about it: "*A domain controller is the server responsible for managing network and identity security requests. It acts as a gatekeeper and authenticates whether the user is authorized to access the IT resources in the domain*" (SolarWinds 2025). Isn't that neat?

I never realized it was a security thing, but it makes sense, you wouldn't want random users on your network accessing your resources.

Now, I need to install active directory domain services on my Windows Server Core, Microsoft provides some documentation on how to do this, as well as the powershell lines themselves, which is handy.

https://learn.microsoft.com/en-us/windows-server/identity/ad-ds/deploy/install-active-directory-domain-services--level-100

It's amusing how easy that was, especially considering I didn't have to craft the command myself. Microsoft describes this as "AD DS server role and installs the AD DS and Active Directory Lightweight Directory Services (AD LDS) server administration tools, including GUI-based tools such as Active Directory Users and Computers and command-line tools such as dcdia.exe". They note how server administration tools are not installed by default, but I don't understand the use case of installing ADDS, but not server admin tools.



The command used above was:

Install-WindowsFeature -name AD-Domain-Services -IncludeManagementTools

```
PS C:\Users\vboxuser> Get-Command -Module ADDSDeployment

CommandType     Name                                               Version    Source
-----------     ----                                               -------    ------
Cmdlet          Add-ADDSReadOnlyDomainControllerAccount            1.0.0.0    ADDSDeployment
Cmdlet          Install-ADDSDomain                                 1.0.0.0    ADDSDeployment
Cmdlet          Install-ADDSDomainController                       1.0.0.0    ADDSDeployment
Cmdlet          Install-ADDSForest                                 1.0.0.0    ADDSDeployment
Cmdlet          Test-ADDSDomainControllerInstallation              1.0.0.0    ADDSDeployment
Cmdlet          Test-ADDSDomainControllerUninstallation            1.0.0.0    ADDSDeployment
Cmdlet          Test-ADDSDomainInstallation                        1.0.0.0    ADDSDeployment
Cmdlet          Test-ADDSForestInstallation                        1.0.0.0    ADDSDeployment
Cmdlet          Test-ADDSReadOnlyDomainControllerAccountCreation   1.0.0.0    ADDSDeployment
Cmdlet          Uninstall-ADDSDomainController                     1.0.0.0    ADDSDeployment
```

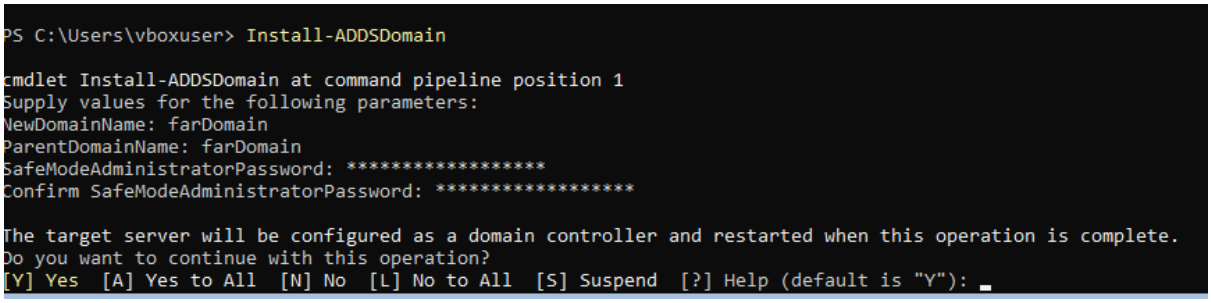
This command:

Get-Command -Module ADDSDeployment

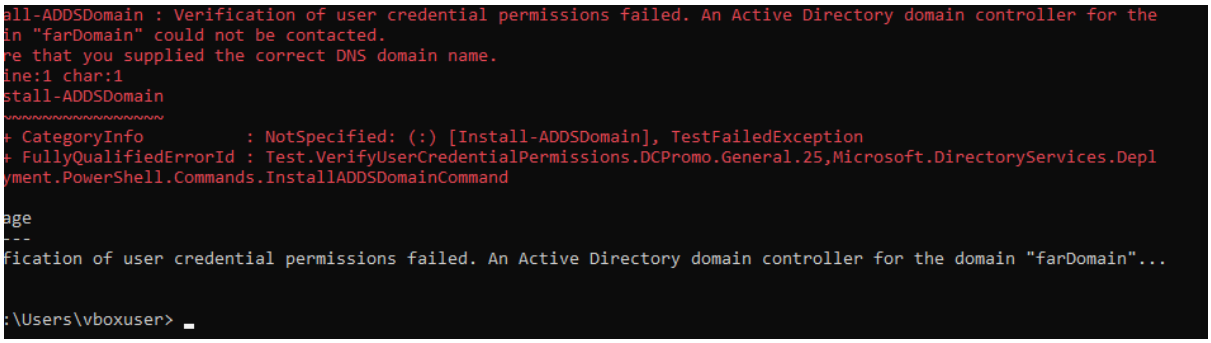
Which is listed by Microsoft, gets the available cmdlets in the ADDSDeployment module, which will be handy if I need them. Which they are, now that I need to setup a domain.

```
CommandType     Name                                               Version    Source
-----------     ----                                               -------    ------
Cmdlet          Add-ADDSReadOnlyDomainControllerAccount            1.0.0.0    ADDSDeployment
Cmdlet          Install-ADDSDomain                                 1.0.0.0    ADDSDeployment
Cmdlet          Install-ADDSDomainController                       1.0.0.0    ADDSDeployment
Cmdlet          Install-ADDSForest                                 1.0.0.0    ADDSDeployment
Cmdlet          Test-ADDSDomainControllerInstallation              1.0.0.0    ADDSDeployment
Cmdlet          Test-ADDSDomainControllerUninstallation            1.0.0.0    ADDSDeployment
Cmdlet          Test-ADDSDomainInstallation                        1.0.0.0    ADDSDeployment
Cmdlet          Test-ADDSForestInstallation                        1.0.0.0    ADDSDeployment
Cmdlet          Test-ADDSReadOnlyDomainControllerAccountCreation   1.0.0.0    ADDSDeployment
Cmdlet          Uninstall-ADDSDomainController                     1.0.0.0    ADDSDeployment


PS C:\Users\vboxuser> Install-ADDSDomain

cmdlet Install-ADDSDomain at command pipeline position 1
Supply values for the following parameters:
NewDomainName: farDomain
ParentDomainName: farDomain
SafeModeAdministratorPassword: ******************
```

In my heart, I truly feel that setting up a domain before setting up a domain controller is wise.



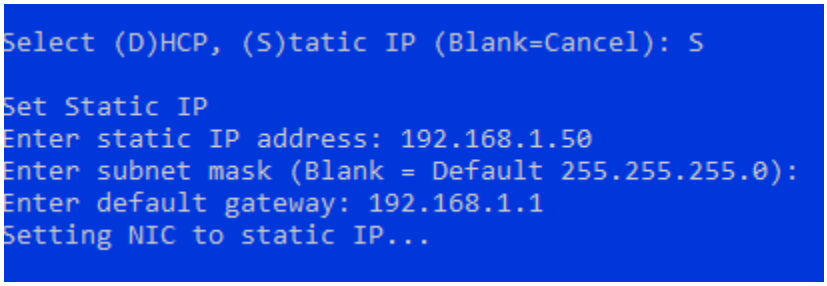
Entirely confused by this statement, it wants to turn my domain into a domain controller.



Ah yes, big old red text. I really enjoy seeing this whenever I'm learning something, because it means I've hit my first roadblock. Clearly, whatever I did was wrong, or did not make sense, but in this case maybe I didn't do things in the right order. The error message describes that a domain controller for the domain 'farDomain' (which is what I wanted to name my domain), could not be contacted.

ChatGPT asks that I set my IP address on the machine to static first, and describes its reasoning as ADDS needing to rely on DNS to locate domain controllers and other services. Basically, if the IP of the DC changes, other machines and the DC itself wouldn't be able to resolve domain names in the domain, you'd think the DC could at least find itself, but I guess not.

But it makes sense for other services, DCs are the cornerstone of ADDS from what I've seen, they're needed for every directory-wide policy or anything such, and to authenticate users. It's clearly important, so it makes sense it should be easily found.



Guess this means I've set it up correctly, at least I've done everything it's asked of me. I understand the need for a static IP address, and I understand the subnet too. The AI describes the use of the default gateway, which is used for handling traffic outside the local network. It needs it for things like software updates, time sync, and external DNS lookups (which I don't plan to make my server do much of). This is a pretty cool summary of those things:

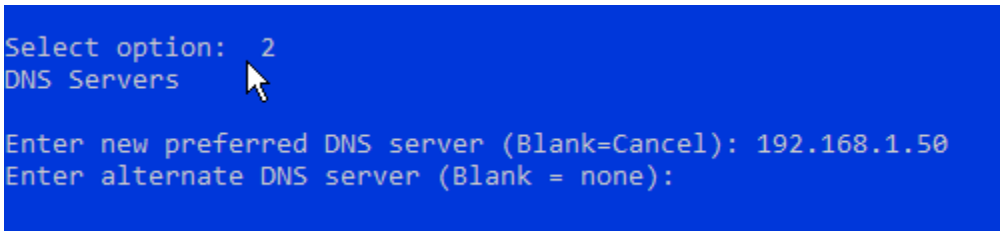
IP Address: "Where am I?"

Subnet Mask: "Who is local?"

Gateway: "Where do I send traffic outside?"

DNS: "Who answers name lookups for the domain?"

Also, since it needs to be able to find itself, I've set the DNS to itself.



Sconfig is proving invaluable honestly, it's not really a wizard, but it is quite magical indeed.

Hopefully it works this time.

```
PS C:\Users\vboxuser> install-addsforest -domainname far.domain.com
SafeModeAdministratorPassword: ******************
Confirm SafeModeAdministratorPassword: ******************

The target server will be configured as a domain controller and restarted when this operation is
complete.
Do you want to continue with this operation?
[Y] Yes  [A] Yes to All  [N] No  [L] No to All  [S] Suspend  [?] Help (default is "Y"): y
```

It worked, I now have my very own forest, and domain.

```
PS C:\Users\vboxuser> Get-ADDomain


AllowedDNSSuffixes                : {}
ChildDomains                      : {}
ComputersContainer                : CN=Computers,DC=far,DC=domain,DC=com
DeletedObjectsContainer           : CN=Deleted Objects,DC=far,DC=domain,DC=com
DistinguishedName                 : DC=far,DC=domain,DC=com
DNSRoot                           : far.domain.com
DomainControllersContainer        : OU=Domain Controllers,DC=far,DC=domain,DC=com
DomainMode                        : Windows2016Domain
DomainSID                         : S-1-5-21-2005061878-36205755-715187568
ForeignSecurityPrincipalsContainer : CN=ForeignSecurityPrincipals,DC=far,DC=domain,DC=com
Forest                            : far.domain.com
InfrastructureMaster              : Domain-Controller-Server.far.domain.com
LastLogonReplicationInterval      :
LinkedGroupPolicyObjects          : {CN={31B2F340-016D-11D2-945F-00C04FB984F9},CN=Policies,CN=System,DC=far,DC=domain,
                                    DC=com}
LostAndFoundContainer             : CN=LostAndFound,DC=far,DC=domain,DC=com
ManagedBy                         :
Name                              : far
NetBIOSName                       : FAR
ObjectClass                       : domainDNS
ObjectGUID                        : 093268fa-4b76-4b08-83a7-e0d4b7c72ec8
ParentDomain                      :
PDCEmulator                       : Domain-Controller-Server.far.domain.com
PublicKeyRequiredPasswordRolling  : True
QuotasContainer                   : CN=NTDS Quotas,DC=far,DC=domain,DC=com
ReadOnlyReplicaDirectoryServers   : {}
```

```
PS C:\Users\vboxuser> Get-AdForest


ApplicationPartitions : {DC=ForestDnsZones,DC=far,DC=domain,DC=com, DC=DomainDnsZones,DC=far,DC=domain,DC=com}
CrossForestReferences : {}
DomainNamingMaster    : Domain-Controller-Server.far.domain.com
Domains               : {far.domain.com}
ForestMode            : Windows2016Forest
GlobalCatalogs        : {Domain-Controller-Server.far.domain.com}
Name                  : far.domain.com
PartitionsContainer   : CN=Partitions,CN=Configuration,DC=far,DC=domain,DC=com
RootDomain            : far.domain.com
SchemaMaster          : Domain-Controller-Server.far.domain.com
Sites                 : {Default-First-Site-Name}
SPNSuffixes           : {}
UPNSuffixes           : {}
```

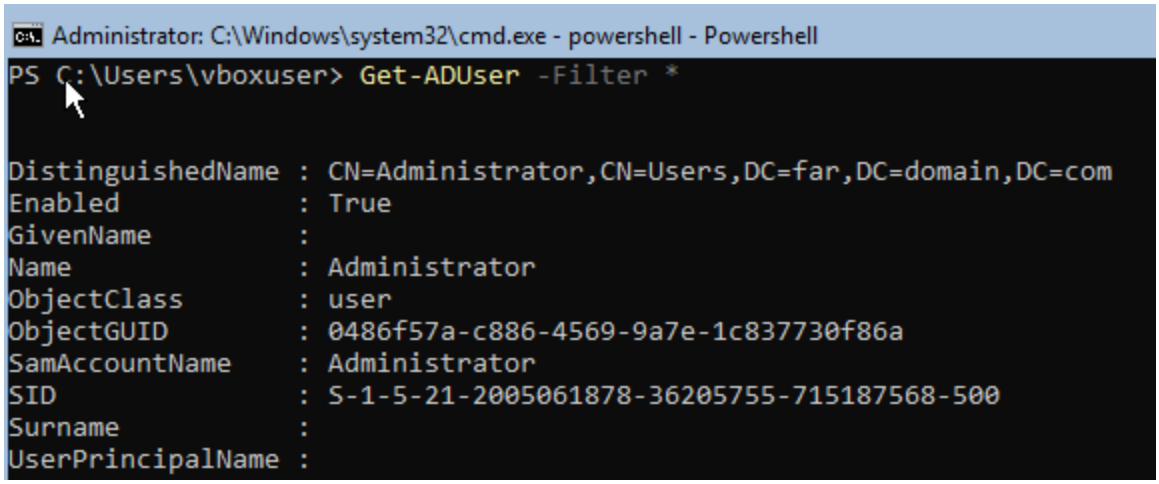
I found the syntax for creating users using the New-ADUser cmdlet.

```
PS C:\Users\vboxuser> Get-Help New-AdUser

NAME
    New-ADUser

SYNTAX
    New-ADUser [-Name] <string> [-WhatIf] [-Confirm] [-AccountExpirationDate <datetime>] [-AccountNotDelegated <bool>]
    [-AccountPassword <securestring>] [-AllowReversiblePasswordEncryption <bool>] [-AuthenticationPolicy
    <ADAuthenticationPolicy>] [-AuthenticationPolicySilo <ADAuthenticationPolicySilo>] [-AuthType {Negotiate | Basic}]
    [-CannotChangePassword <bool>] [-Certificates <X509Certificate[]>] [-ChangePasswordAtLogon <bool>] [-City
    <string>] [-Company <string>] [-CompoundIdentitySupported <bool>] [-Country <string>] [-Credential <pscredential>]
    [-Department <string>] [-Description <string>] [-DisplayName <string>] [-Division <string>] [-EmailAddress
    <string>] [-EmployeeID <string>] [-EmployeeNumber <string>] [-Enabled <bool>] [-Fax <string>] [-GivenName
    <string>] [-HomeDirectory <string>] [-HomeDrive <string>] [-HomePage <string>] [-HomePhone <string>] [-Initials
    <string>] [-Instance <ADUser>] [-KerberosEncryptionType {None | DES | RC4 | AES128 | AES256}] [-LogonWorkstations
    <string>] [-Manager <ADUser>] [-MobilePhone <string>] [-Office <string>] [-OfficePhone <string>] [-Organization
    <string>] [-OtherAttributes <hashtable>] [-OtherName <string>] [-PassThru] [-PasswordNeverExpires <bool>]
    [-PasswordNotRequired <bool>] [-Path <string>] [-POBox <string>] [-PostalCode <string>]
    [-PrincipalsAllowedToDelegateToAccount <ADPrincipal[]>] [-ProfilePath <string>] [-SamAccountName <string>]
    [-ScriptPath <string>] [-Server <string>] [-ServicePrincipalNames <string[]>] [-SmartcardLogonRequired <bool>]
    [-State <string>] [-StreetAddress <string>] [-Surname <string>] [-Title <string>] [-TrustedForDelegation <bool>]
    [-Type <string>] [-UserPrincipalName <string>]  [<CommonParameters>]


ALIASES
```

This is an extremely important command, it basically informs me on everything I can do within AD, to my knowledge.

```
PS C:\Users\vboxuser> Get-Command -Module ActiveDirectory

CommandType     Name                                               Version    Source
-----------     ----                                               -------    ------
Cmdlet          Add-ADCentralAccessPolicyMember                    1.0.1.0    ActiveDirectory
Cmdlet          Add-ADComputerServiceAccount                       1.0.1.0    ActiveDirectory
Cmdlet          Add-ADDomainControllerPasswordReplicationPolicy    1.0.1.0    ActiveDirectory
Cmdlet          Add-ADFineGrainedPasswordPolicySubject             1.0.1.0    ActiveDirectory
Cmdlet          Add-ADGroupMember                                  1.0.1.0    ActiveDirectory
Cmdlet          Add-ADPrincipalGroupMembership                     1.0.1.0    ActiveDirectory
Cmdlet          Add-ADResourcePropertyListMember                   1.0.1.0    ActiveDirectory
Cmdlet          Clear-ADAccountExpiration                          1.0.1.0    ActiveDirectory
Cmdlet          Clear-ADClaimTransformLink                         1.0.1.0    ActiveDirectory
Cmdlet          Disable-ADAccount                                  1.0.1.0    ActiveDirectory
Cmdlet          Disable-ADOptionalFeature                          1.0.1.0    ActiveDirectory
```

It is quite crucial that I am able to view all my users, and I can do this with the following:


Administrator: C:\Windows\system32\cmd.exe - powershell - Powershell
PS C:\Users\vboxuser> Get-ADUser -Filter *
DistinguishedName : CN=Administrator,CN=Users,DC=far,DC=domain,DC=com
Enabled : True
GivenName :
Name : Administrator
ObjectClass : user
ObjectGUID : 0486f57a-c886-4569-9a7e-1c837730f86a
SamAccountName : Administrator
SID : S-1-5-21-2005061878-36205755-715187568-500
Surname :
UserPrincipalName :

https://learn.microsoft.com/en-us/windows-server/identity/ad-ds/deploy/install-active-directory-domain-services--level-100-#install-ad-ds-by-using-windows-powershell