

# Deploying an On-Premises Active Directory

## Part 1: Deploying an Active Directory using Azure Virtual Machines



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# 1 Introduction

## 1.1 What is an Active Directory? And why would you set one up with Microsoft Azure?

Setting up an Active Directory (AD) on Microsoft is a valuable exercise in modern enterprise infrastructure management. This project will document my process of establishing an AD environment using Azure Virtual Networks, subnets, and virtual machines running Windows Server 2022 and Windows 10.

Active Directory is a crucial component for organisations, providing centralised authentication, authorisation, and directory services. Implementing AD on Azure offers several compelling benefits:

1. Scalability: Easily adjust resources to meet changing organisational needs.
2. High availability: Leverage Azure's robust infrastructure for improved uptime.
3. Cost-effectiveness: Reduce on-premises hardware and maintenance costs.
4. Global accessibility: Enable secure access to resources from anywhere in the world.
5. Integration: Seamlessly connect with other Azure and Microsoft 365 services.

By creating an AD environment in Azure, organisations can modernise their infrastructure, improve remote work capabilities, and streamline identity management. This project will provide hands-on experience with cloud-based network configuration and virtual machine management within the Azure ecosystem.

Through this endeavour, I aim to gain practical insights into the deployment and management of cloud-based Active Directory services, enhancing my understanding of enterprise-level identity and access management in a cloud environment.

## 1.2 Resources and Software tools we'll be using

The Azure resources we'll be creating and working with:

- Azure Virtual Networks and Subnets
- Azure Virtual Machines (Windows Server 2022 and Windows 10)

Software/Tools we'll be using to configure Active Directory:

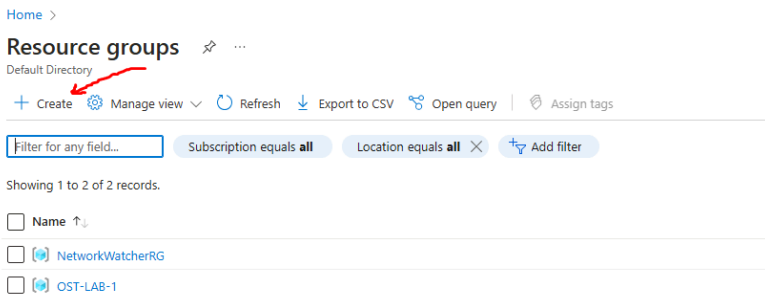
- Server Manager
- Command Prompt

## 2 Setting up the Virtual Machines

During this section, I'll be setting up the Windows Server and Windows 10 Virtual Machines on Azure. The Windows Server will be made as our Active Directory Domain Controller, and the Windows 10 Machine will be our client machine.

### 2.1 Setting up Windows Server VM on Azure

Go to [portal.azure.com](https://portal.azure.com) > resource groups



#### - Select Create

Microsoft Azure Upgrade Search

Home > Resource groups >

### Create a resource group

Basics Tags Review + create

Resource group - A container that holds related resources for an Azure solution. The resource group can include all the resources for the solution, or only those resources that you want to manage as a group. You decide how you want to allocate resources to resource groups based on what makes the most sense for your organization. [Learn more](#)

**Project details**

Subscription \* Azure subscription 1

Resource group \* DC-RG

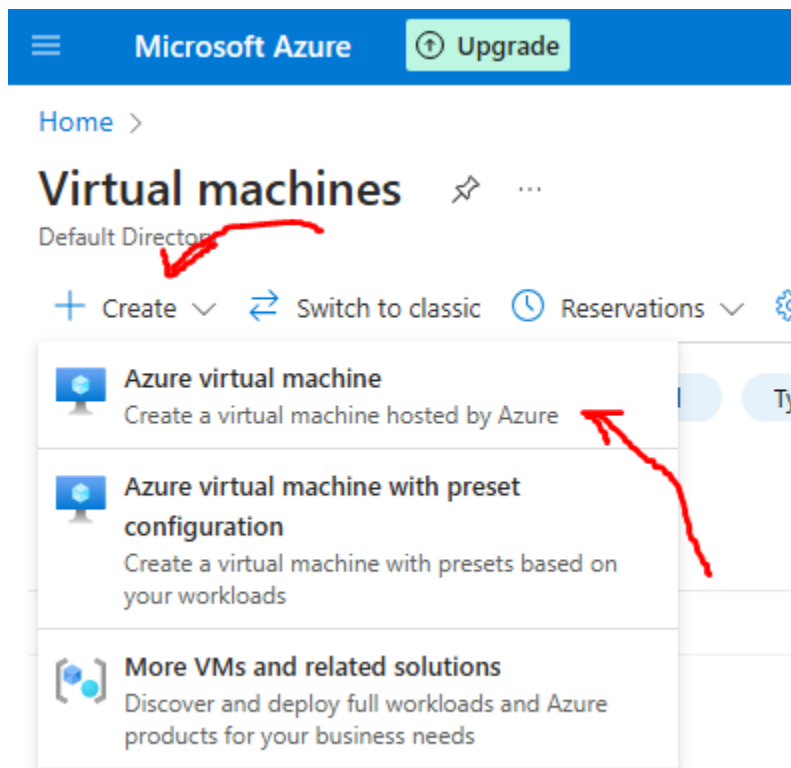
**Resource details**

Region \* (Europe) UK South

Review + create < Previous Next: Tags >

- I'm naming it as DC-RG (Domain Controller - Resource Group)
- Selected UK South as region as it's the closest server to me
- Press Review + Create

We'll now set up a Virtual Machine. Search for Virtual Machines



- Select Create
- Azure Virtual Machine

## Create a virtual machine ...



Help me create a low cost VM

Help me create a VM optimized for high availability

Help me choose the right VM size for my workload

**i** This subscription may not be eligible to deploy VMs of certain sizes in certain regions.

### Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription \* ⓘ

Azure subscription 1

Resource group \* ⓘ

DC-RG

[Create new](#)

### Instance details

Virtual machine name \* ⓘ

DC1

Region \* ⓘ

(Europe) UK South

Availability options ⓘ

Availability zone

Zone options ⓘ

- ☒ Self-selected zone  
Choose up to 3 availability zones, one VM per zone
- ☐ Azure-selected zone (Preview)  
Let Azure assign the best zone for your needs

Availability zone \* ⓘ

Zone 1

**i** You can now select multiple zones. Selecting multiple zones will create one VM per zone. [Learn more](#)

Security type ⓘ

Trusted launch virtual machines

[Configure security features](#)

- Fill in the details as shown
- Select DC-RG resource group we made
- You can name the VM what you want, I named it DC1
- Select closest region
- Everything else should be default in this screenshot

Image \* ⓘ Windows Server 2022 Datacenter: Azure Edition - x64 Gen2 (free services el See all images | Configure VM generation

VM architecture ⓘ ☐ Arm64 ☒ x64

Arm64 is not supported with the selected image.

Run with Azure Spot discount ⓘ ☐

i You are in the free trial period. Costs associated with this VM can be covered by any remaining credits on your subscription. [Learn more](#)

Size \* ⓘ Standard\_D2s\_v3 - 2 vcpus, 8 GiB memory (\$151.84/month) See all sizes

Enable Hibernation ⓘ ☐

i Hibernate is not supported by the size that you have selected. Choose a size that is compatible with Hibernation to enable this feature. [Learn more](#)

#### Administrator account

Username \* ⓘ DC-VirtualAdmin ✓

Password \* ..... ✓

Confirm password \* ..... ✓

- Image will be Windows Server 2022
- Size can be your choice, I picked 2 cores for demonstration purposes and ease of setting up.
- Username can be whatever you want. I called mine DC-VirtualAdmin
- Make a strong password

#### Inbound port rules

Select which virtual machine network ports are accessible from the public internet. You can specify more limited or granular network access on the Networking tab.

Public inbound ports \* ⓘ ☐ None ☒ Allow selected ports

Select inbound ports \* RDP (3389) ✓

i All traffic from the internet will be blocked by default. You will be able to change inbound port rules in the VM > Networking page.

- Here I've selected RDP - We need this inbound port as we'll be accessing this VM remotely.
- After this press Next : Disks >

Basics Disks Networking Management Monitoring Advanced Tags Review + create

Azure VMs have one operating system disk and a temporary disk for short-term storage. You can attach additional data disks. The size of the VM determines the type of storage you can use and the number of data disks allowed. [Learn more](#)

#### VM disk encryption

Azure disk storage encryption automatically encrypts your data stored on Azure managed disks (OS and data disks) at rest by default when persisting it to the cloud.

Encryption at host

☐

Encryption at host is not registered for the selected subscription. [Learn more about enabling this feature](#)

#### OS disk

OS disk size

Image default (127 GiB)

OS disk type \*

Premium SSD (locally-redundant storage)

Delete with VM

☒

Key management

Platform-managed key

Enable Ultra Disk compatibility

☐

#### Data disks for DC1

You can add and configure additional data disks for your virtual machine or attach existing disks. This VM also comes with a temporary disk.

LUN	Name	Size (GiB)	Disk type	Host caching	Delete with VM
<a href="#">Create and attach a new disk</a> <a href="#">Attach an existing disk</a>					

< Previous

Next : Networking >

Review + create

- We can keep this the same. Click Next : Networking >

[Home](#) > [Virtual machines](#) >

### Create a virtual machine ...

[Help me create a low cost VM](#) [Help me create a VM optimized for high availability](#) [Help me choose the right VM size for my workload](#)

Basics Disks Networking Management Monitoring Advanced Tags Review + create

Define network connectivity for your virtual machine by configuring network interface card (NIC) settings. You can control ports, inbound and outbound connectivity with security group rules, or place behind an existing load balancing solution. [Learn more](#)

#### Network interface

When creating a virtual machine, a network interface will be created for you.

Virtual network \*   
 (new) DC1-vnet   
 [Create new](#)

Subnet \*   
 (new) default (10.1.0.0/24)

Public IP   
 (new) DC1-ip   
 [Create new](#)

NIC network security group   
 ☐ None   
 ☒ Basic   
 ☐ Advanced

Public inbound ports \*   
 ☐ None   
 ☒ Allow selected ports

Select inbound ports \*   
 RDP (3389)

**⚠ This will allow all IP addresses to access your virtual machine.** This is only recommended for testing. Use the Advanced controls in the Networking tab to create rules to limit inbound traffic to known IP addresses.

Delete public IP and NIC when VM is ☐

< Previous

Next : Management >

Review + create

- As long as you have the same settings as I have - which is default - you're good to go
- Click on Review + create

## 2.2 Setting up Windows 10 VM on Azure

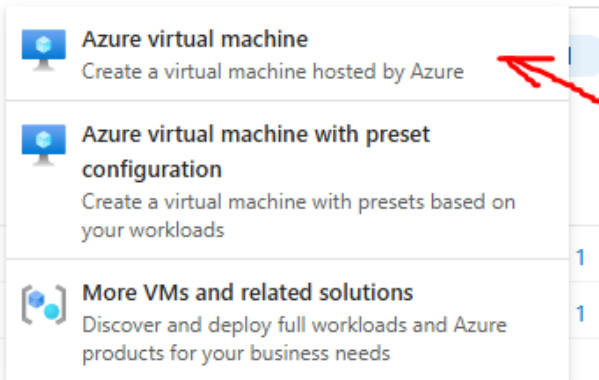
Now we'll be setting up the Windows 10 VM

[Home](#) >

### Virtual machines

Default Directory

+ Create ▾ [Switch to classic](#) [Reservations](#)



#### - Create an Azure Virtual Machine

[Project example](#)

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription *	<input type="text" value="Azure subscription 1"/>
Resource group *	<input type="text" value="DC-RG"/> <a href="#">Create new</a>
<b>Instance details</b>	
Virtual machine name *	<input type="text" value="Client1"/>
Region *	<input type="text" value="(Europe) UK South"/>
Availability options	<input type="text" value="Availability zone"/>
Zone options	<p><input checked="" type="radio"/> Self-selected zone Choose up to 3 availability zones, one VM per zone</p> <p><input type="radio"/> Azure-selected zone (Preview) Let Azure assign the best zone for your needs</p>
Availability zone *	<input type="text" value="Zone 1"/> <input checked="" type="checkbox"/> You can now select multiple zones. Selecting multiple zones will create one VM per zone. <a href="#">Learn more</a>
Security type	<input type="text" value="Trusted launch virtual machines"/> <a href="#">Configure security features</a>
Image *	<input type="text" value="Windows 10 Pro, version 22H2 - x64 Gen2 (free services eligible)"/> <a href="#">See all images</a>   <a href="#">Configure VM generation</a>

- Select these options. Similar as before, only difference is name & Image
- Name: Client1
- Image: Windows 10 Pro



## Create a virtual machine ...

[Help me create a low cost VM](#) [Help me create a VM optimized for high availability](#) [Help me choose the right VM](#)

**i** You are in the free trial period. Costs associated with this VM can be covered by any remaining credits on your subscription. [Learn more](#)

Size \* ☐ ☐ Standard\_DS1\_v2 - 1 vcpu, 3.5 GiB memory (\$64.09/month) ☐   
 [See all sizes](#)

Enable Hibernation ☐

**i** Hibernation is not supported by the size that you have selected. Choose a size that is compatible with Hibernation to enable this feature. [Learn more](#)

### Administrator account

Username \*  ☐

Password \*  ☐

Confirm password \*  ☐

### Inbound port rules

Select which virtual machine network ports are accessible from the public internet. You can specify more limited or granular network access on the Networking tab.

Public inbound ports \* ☐ None ☒ Allow selected ports

Select inbound ports \*  ☐

**i** All traffic from the internet will be blocked by default. You will be able to change inbound port rules in the VM > Networking page.

[< Previous](#) [Next : Disks >](#) [Review + create](#)

- Select a size, I've gone for a smaller size because I've run out of CPUs for my trial
- Remember your username and pass
- Select Next : Disks >

### VM disk encryption

Azure disk storage encryption automatically encrypts your data stored on Azure managed disks (OS and data disks) at rest by default when persisting it to the cloud.

Encryption at host ☐

**i** Encryption at host is not registered for the selected subscription. [Learn more about enabling this feature](#)

### OS disk

OS disk size ☐ Image default (127 GiB) ☐

OS disk type \* ☐ Premium SSD (locally-redundant storage) ☐

Delete with VM ☒

Key management ☐ Platform-managed key ☐

Enable Ultra Disk compatibility ☐   
 Ultra disk is not supported for the selected VM size Standard\_DS1\_v2 in UK South.

### Data disks for Client1

You can add and configure additional data disks for your virtual machine or attach existing disks. This VM also comes with a temporary disk.

LUN	Name	Size (GiB)	Disk type	Host caching	Delete with VM
-----	------	------------	-----------	--------------	----------------

[Create and attach a new disk](#) [Attach an existing disk](#)

[< Previous](#) [Next : Networking >](#) [Review + create](#)



- Everything should be as shown.
- Click Next : Networking >


Basics Disks **Networking** Management Monitoring Advanced Tags Review + create



Define network connectivity for your virtual machine by configuring network interface card (NIC) settings. You can control ports, inbound and outbound connectivity with security group rules, or place behind an existing load balancing solution. [Learn more](#)

#### Network interface

When creating a virtual machine, a network interface will be created for you.


Virtual network \*     
[Create new](#)


Subnet \*    
[Manage subnet configuration](#)

Public IP    
[Create new](#) 

NIC network security group ☐ None  
☒ Basic  
☐ Advanced


Public inbound ports \* ☐ None  
☒ Allow selected ports

Select inbound ports \*  


 This will allow all IP addresses to access your virtual machine. This is only recommended for testing. Use the Advanced controls in the Networking tab to create rules to limit inbound traffic to known IP addresses.

- We want to make sure it's in the same Virtual Network so click on the dropdown and make sure the DC1-vnet is selected
- The public IP may not be shown. If not, we'll make a new one called Client1-ip

## Create public IP address

Name \*  

SKU ☐ Basic ☒ Standard


 Availability zones are only supported on Standard SKU public IP addresses.

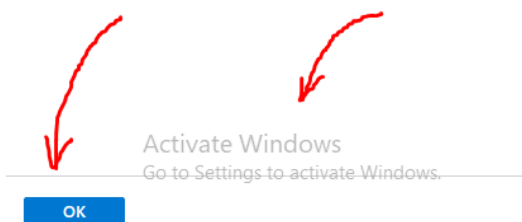
Assignment ☒ Static

Routing preference ☒ Microsoft network ☐ Internet

Availability zone ☐ Zone-redundant ☒ Zone 1

- This should be what is shown by default. If not, just type what is shown and press OK

- Very important, ignore the:  
"Activate Windows logo" 



Basics   Disks   Networking   Management   Monitoring   Advanced   Tags   Review + create

Define network connectivity for your virtual machine by configuring network interface card (NIC) settings. You can control ports, inbound and outbound connectivity with security group rules, or place behind an existing load balancing solution.

[Learn more](#)

### Network interface

When creating a virtual machine, a network interface will be created for you.

Virtual network *	<div>DC1-vnet</div> <div>Create new</div>
Subnet *	<div>default (10.1.0.0/24)</div> <div>Manage subnet configuration</div>
Public IP	<div>(new) Client1-ip</div> <div>Create new</div>
NIC network security group	<div><input type="radio"/> None</div> <div><input checked="" type="radio"/> Basic</div> <div><input type="radio"/> Advanced</div>
Public inbound ports *	<div><input type="radio"/> None</div> <div><input checked="" type="radio"/> Allow selected ports</div>
Select inbound ports *	<div>RDP (3389)</div>

**⚠ This will allow all IP addresses to access your virtual machine.** This is only recommended for testing. Use the Advanced controls in the Networking tab to create rules to limit inbound traffic to known IP addresses.

< Previous   Next : Management >   **Review + create**

- The Public IP should now be set.
- Click on Review + Create

### Licensing

☐ I confirm I have an eligible Windows 10/11 license with multi-tenant hosting rights. \*

✖ Please confirm.

[Review multi-tenant hosting rights for Windows 10/11 compliance](#)

< Previous   Next : Disks >   **Review + create**

- If you get this error, just tick this. Then Review + Create

Home > Virtual machines > DC1

## Virtual machines

Default Directory

+ Create ▾ Switch to classic ...

Filter for any field...

Name ↑↓

- Client1
- DC1
- VM-OST

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Connect

Networking

Network settings

Load balancing

Application security groups

Network manager

DC1 | Network settings

Virtual machine

Search

This is a new experience. [Please provide feedback](#)

Attach network interface Detach network interface View topology

Network interface / IP configuration

dc1116\_z1 (primary) / ipconfig1 (primary)

Essentials

Network interface

dc1116\_z1

Virtual network / subnet

DC1-vnet / default

Public IP address

20.90.177.176

Private IP address

- Next we just want to make sure our DC Server has a static IP address - this way it won't continually change
- 1. Go to your Virtual Machines
- 2. Select DC1
- 3. Go to Networking > Network Settings
- 4. Select Network Interface

dc1116\_z1 | IP configurations

Network interface

Search

Refresh

Overview

Activity log

Access control (IAM)

Tags

Settings

IP configurations

DNS servers

Network security group

Properties

Locks

Monitoring

Automation

Help

IP Settings

Enable IP forwarding ☒

Virtual network

DC1-vnet

Gateway load balancer

None

Subnet \*

default (10.1.0.0/24) 249 free IP addresses

249 free IP addresses

Private and public IP addresses can be assigned to a virtual machine's network interface controller. You can add as many private and public IPv4 addresses as necessary to a network interface, within the limits listed in the Azure limits article. [Learn more](#)

+ Add ⚙ Make primary 🗑 Delete

Name	IP Version	Type	Private IP Address	Public IP Address
<input checked="" type="checkbox"/> ipconfig1	IPv4	Primary	10.1.0.4 (Dynamic)	20.90.177.176 (DC1-ip)

- Select "ipconfig1"

## Edit IP configuration



dc1116\_z1

A primary IP configuration already exists. Any additional IP configurations will be secondary. The virtual network this network interface is attached to only supports IPv4. [Learn more](#)

Name \*

IP version IPv4

Type Primary

### Private IP address settings

Allocation ☐ Dynamic

☒ Static

Private IP address \*

### Public IP address settings

Associate public IP address ☒

Public IP address \*

[Create a public IP address](#)

- Make sure "Static" is selected
- The private IP address should be given. Mine is 10.1.0.4 but usually it'll be 10.0.0.4, it's only because I already have an IP address of 10.0.0.4 running.

[JSON View](#)

Operating system

Windows (Windows Server 2022 Datacenter Azure Edition)

Size

Standard DS1 v2 (1 vcpu, 3.5 GiB memory)

Public IP address

[20.90.177.176](#)

Virtual network/subnet

[DC1-vnet/default](#)

DNS name

[Not configured](#)

Health state

-

Time created

8/25/2024, 6:57 PM UTC

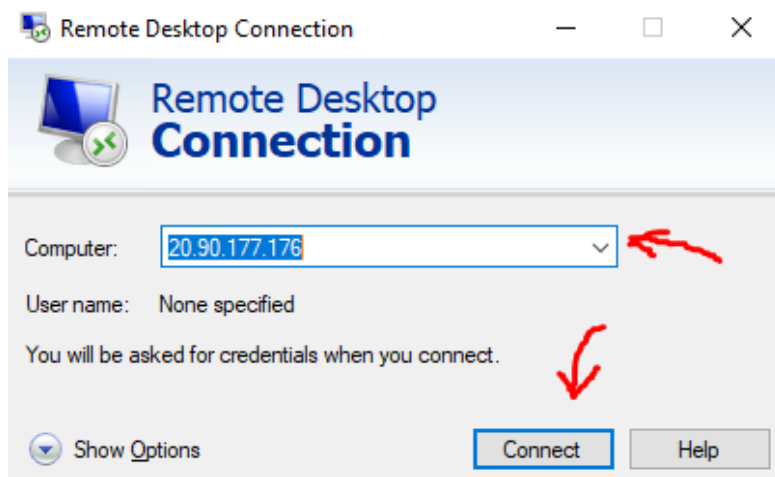
- All you have to do here is copy the Public IP Address given and you're set to go onto the next stage

### 3 Setting up Windows Server VM

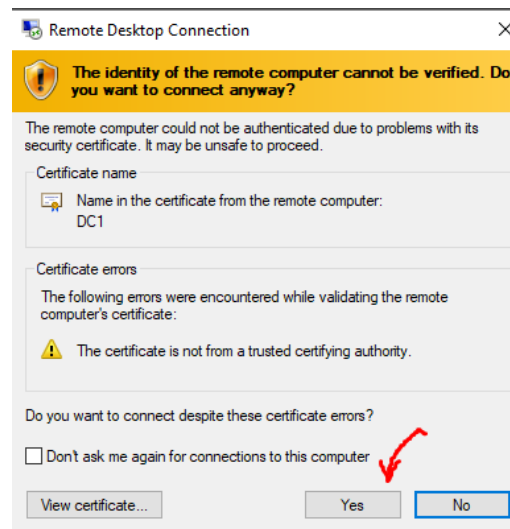
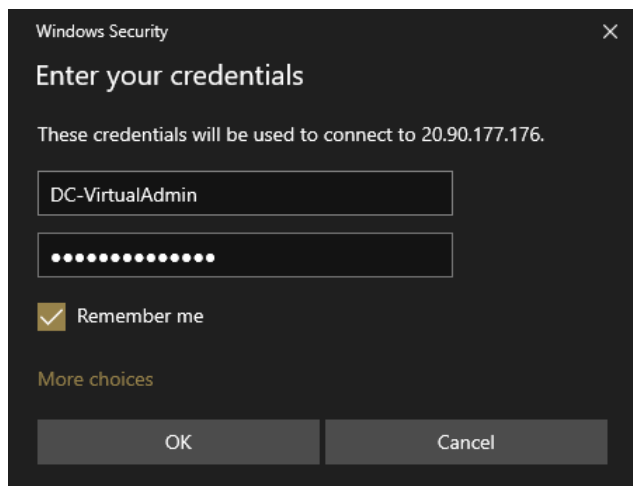
During this section, I'll be setting up the Active Directory within our Windows Server VM. This will include a number of steps:

- Configuring the Firewall
- Adding Roles and Features
- Creating a Domain Controller
- Creating Organisational Units
- Logging in as an Admin

Before we start, let's remote into our Windows Server Virtual Machine.



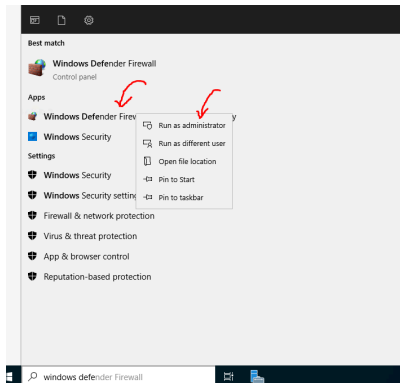
- Paste the IP we copied from earlier
- Connect



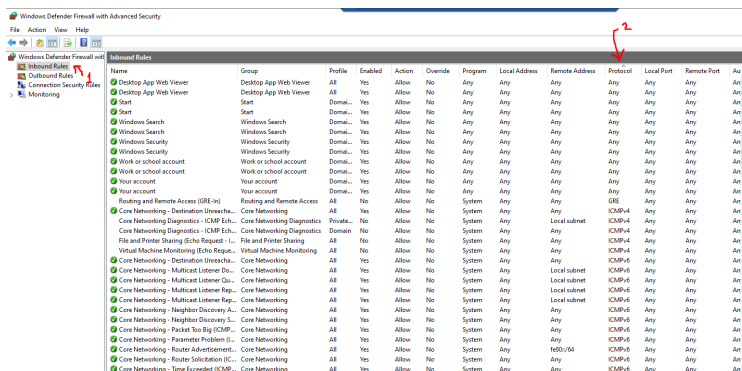
- Use the credentials you made during the setup for Windows Server
- Click OK then on the next pop-up, click Yes

## 3.1 Configuring Firewall

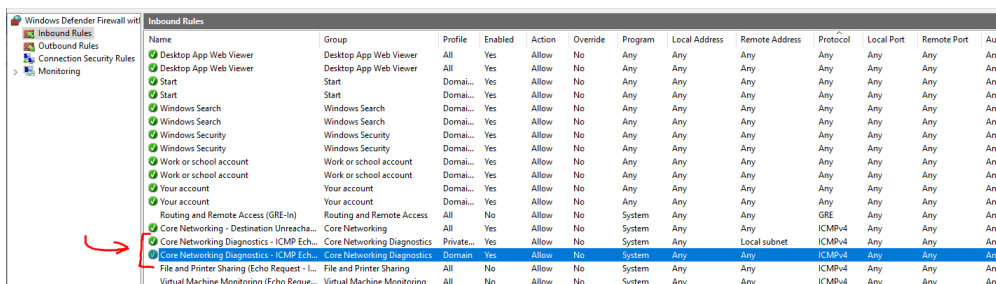
Something that we must do is enable ICMP Echo Request. Enabling ICMP allows you to use ping on the Command Line to check if your server is reachable from other devices on the network - this is important for Active Directories. This can help diagnose connectivity issues or verify that network routes are correctly configured.



- Search for Windows Defender Firewall
- Run as Administrator



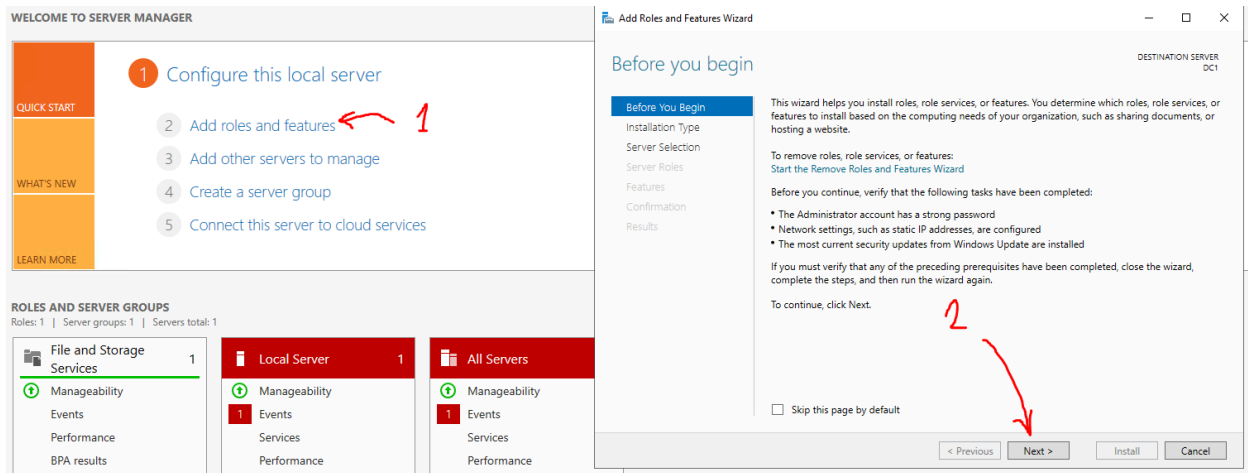
- Select Inbound Rules
- Select Protocol to order Any to the top



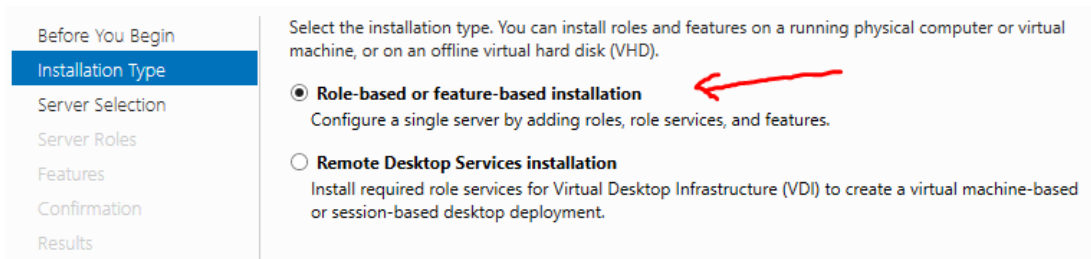
- Enable Core Networking Diagnostics - ICMP. Both the “Private” and “Domain” profiles.

## 3.2 Setting up Active Directory

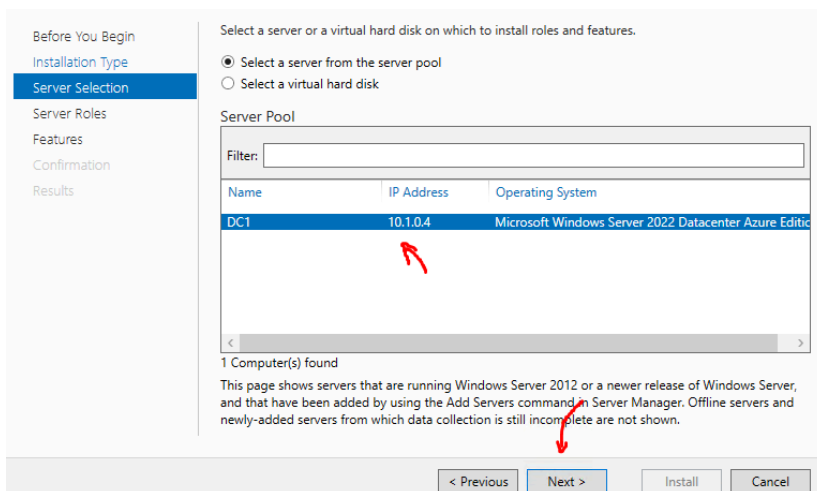
Setting up an Active Directory Domain Services will have us select the “Add Roles and Features” then eventually selecting the Active Directory Domain Services from there. The steps of this will be shown below.



- 1. Select Add roles and Features
- 2. Select Next on the pop-up

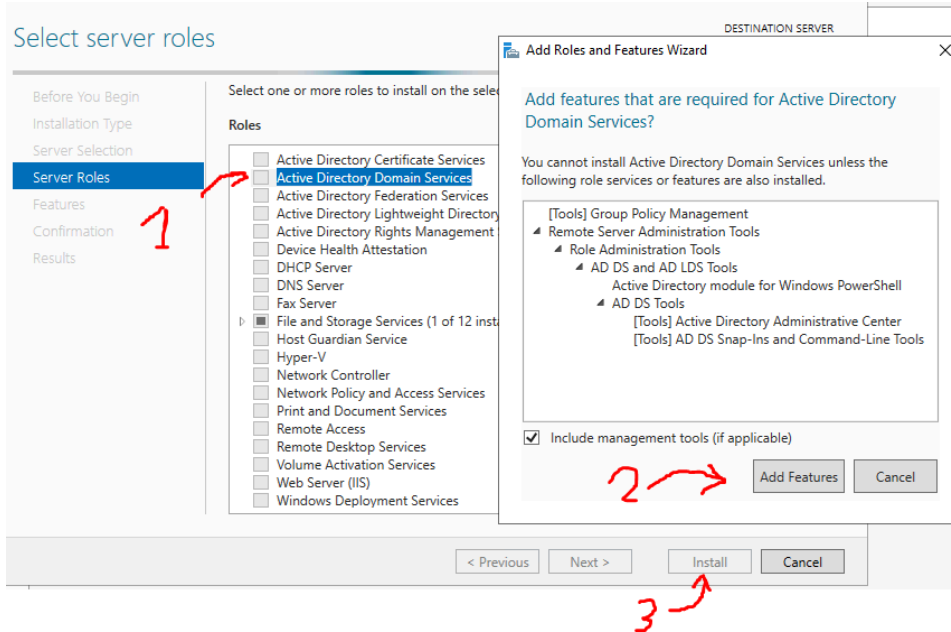


- Select Role-based and click next

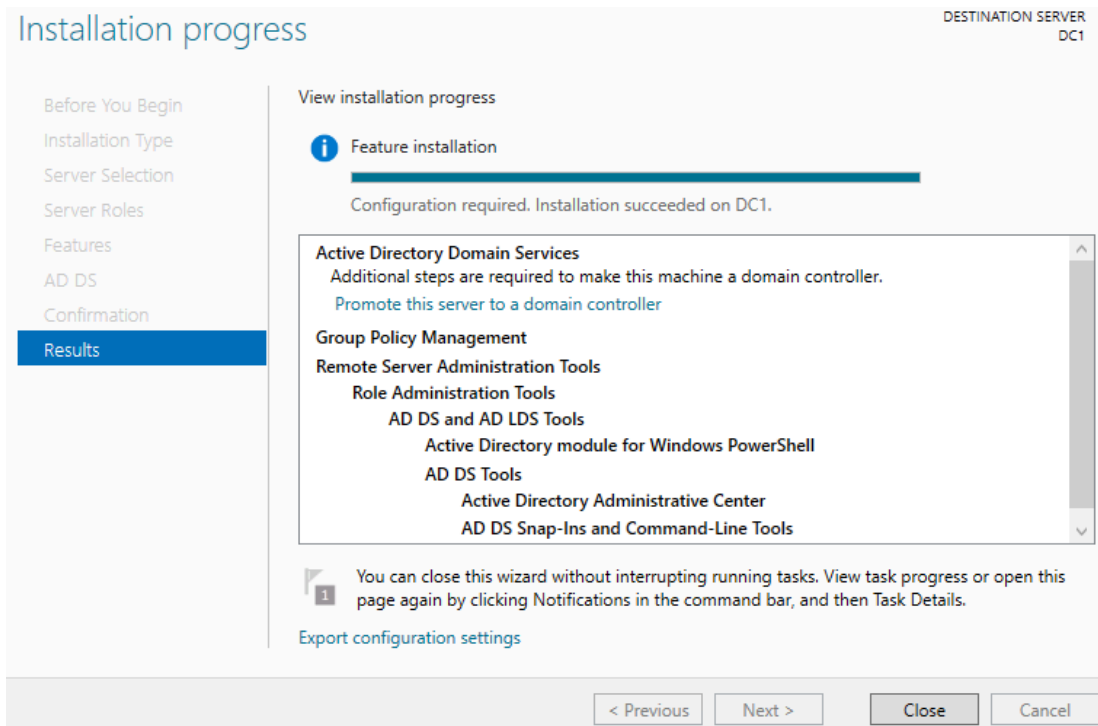


- Select the server and click Next





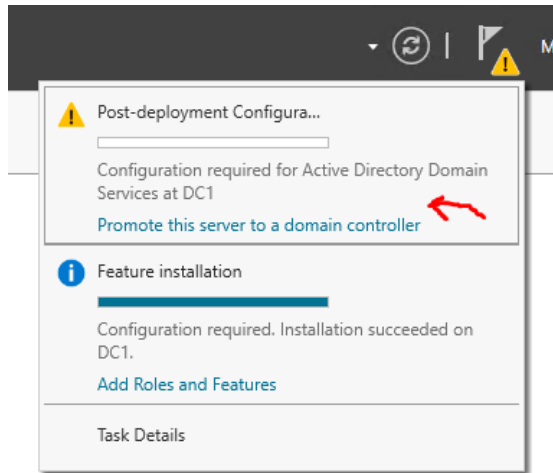
- Select Active Directory Domain Services
- Select Add Features
- Press Next and continue pressing next until you install



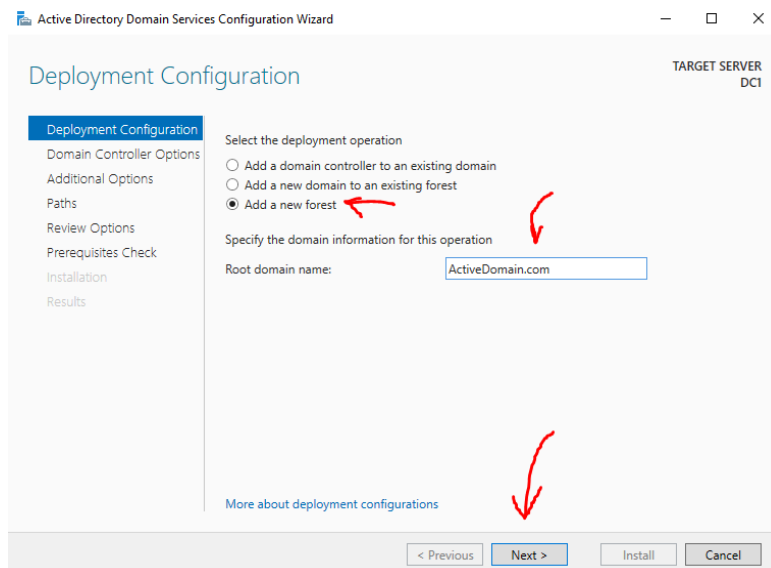
### 3.3 Creating Domain Controller

A Domain Controller is a server in a network that manages user logins and access to resources like files and applications. It acts as the "gatekeeper," ensuring that only authorised users can access certain parts of the network. It also stores and organises important information about users and devices, making it easier to manage and secure the network.

Here we'll be able to promote our server into a domain controller.



- Click on the arrow on the right
- Select "Promote this server to a domain controller"



- Select "Add a new forest"
- Root Domain Name: "ActiveDomain.com"
- Click Next

Active Directory Domain Services Configuration Wizard

Domain Controller Options

TARGET SERVER  
DC1

Deployment Configuration

Domain Controller Options

DNS Options

Additional Options

Paths

Review Options

Prerequisites Check

Installation

Results

Select functional level of the new forest and root domain

Forest functional level: Windows Server 2016

Domain functional level: Windows Server 2016

Specify domain controller capabilities

☒ Domain Name System (DNS) server

☒ Global Catalog (GC)

☐ Read only domain controller (RODC)

Type the Directory Services Restore Mode (DSRM) password

Password: [password field]

Confirm password: [password field]

[More about domain controller options](#)

< Previous Next > Install Cancel

- Set up a password
- Select Next

Active Directory Domain Services Configuration Wizard

DNS Options

TARGET SERVER  
DC1

Deployment Configuration

Domain Controller Options

DNS Options

Additional Options

Paths

Review Options

Prerequisites Check

Installation

Results

Specify DNS delegation options

☐ Create DNS delegation

[A delegation for this DNS server cannot be created because the authoritative parent zone cannot be found... Show more](#)

[More about DNS delegation](#)

< Previous Next > Install Cancel

- Next

Active Directory Domain Services Configuration Wizard

Additional Options

TARGET SERVER  
DC1

Deployment Configuration

Domain Controller Options

DNS Options

Additional Options

Paths

Review Options

Prerequisites Check

Installation

Results

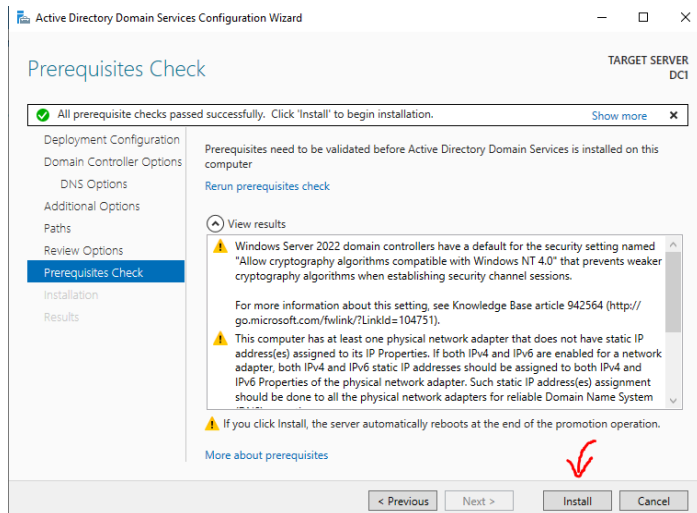
Verify the NetBIOS name assigned to the domain and change it if necessary

The NetBIOS domain name: ACTIVEDOMAIN

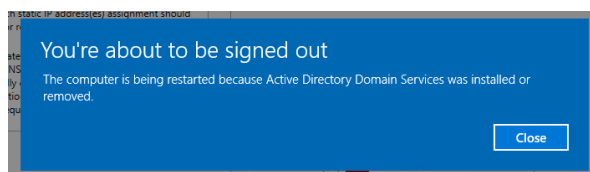
[More about additional options](#)

< Previous Next > Install Cancel

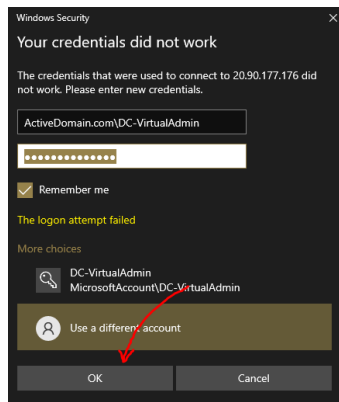
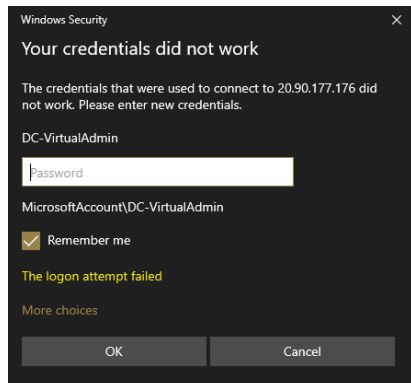
- Wait for awhile
- Then when ready, press Next
- Continue to go next until Prerequisites Check



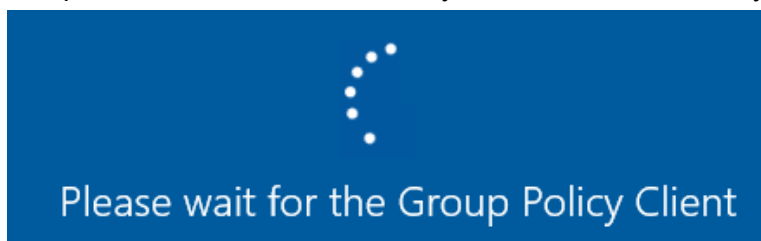
- Install



- The remote access will then reset as the Windows Server VM will restart



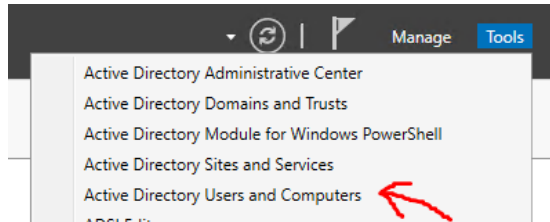
- What should happen here is that you'll be unable to log in. That's because we've set up an Active Domain. So we'll need to log into our active domain.
- Setup the new credentials. It'll be your domainName.com\yourAdminName



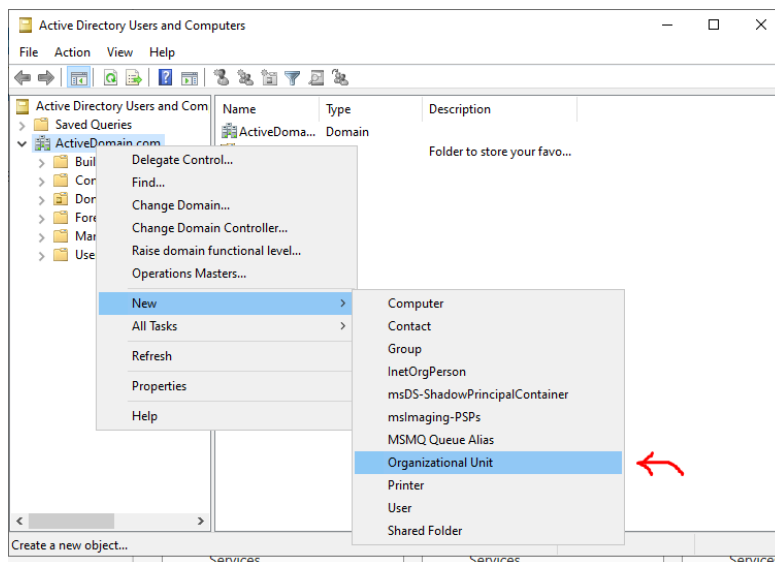
- Wait for this to complete, after this we'll be taken back to our Active Directory

## 3.4 Creating Organisational Units

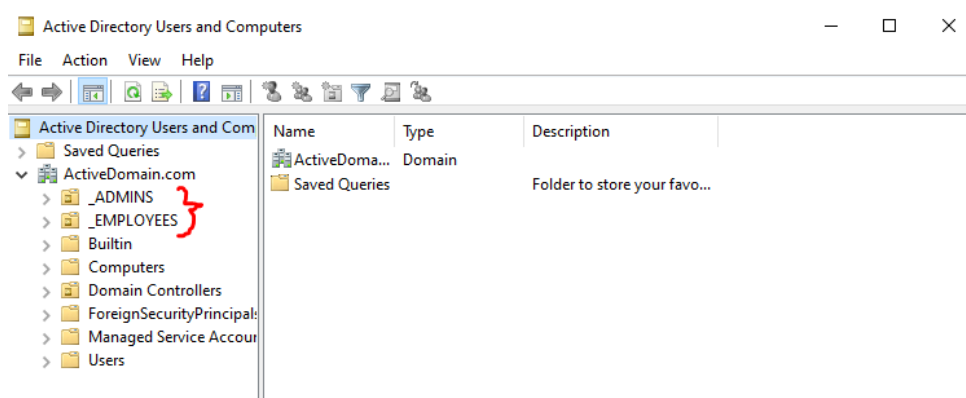
Now we're going to setup some Organisational Units. Think of these as folders for our users. This will allow us to manage our users easier.



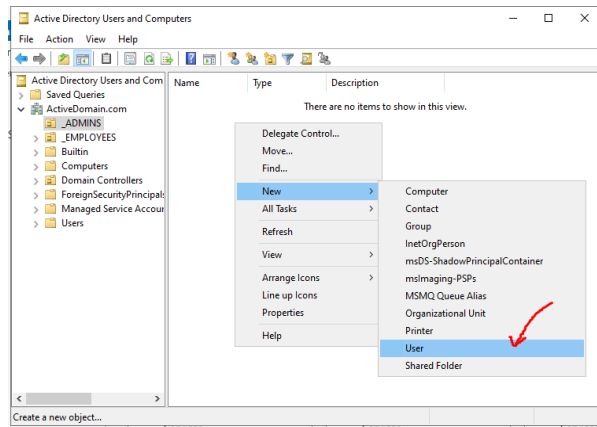
- Select Tools
- Active Directory Users and Computers



- We'll now create an organisational unit
- GO to ActiveDomain.com > Right click > New > Organisational Unit



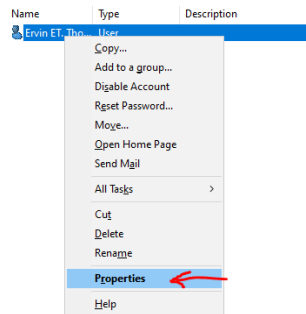
- We've now setup \_ADMS and \_EMPLOYEES as two new organisational units



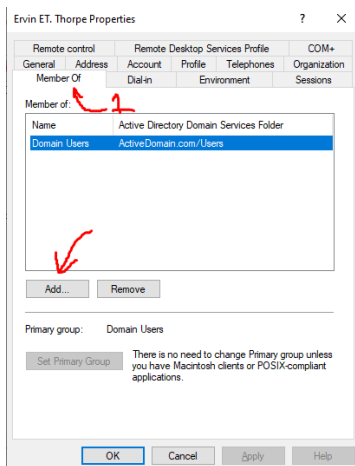
- We'll now set up a new admin user
- Right click > New > User

- Set up a new user. I like to use a-FirstLetterLastName. A = Admin

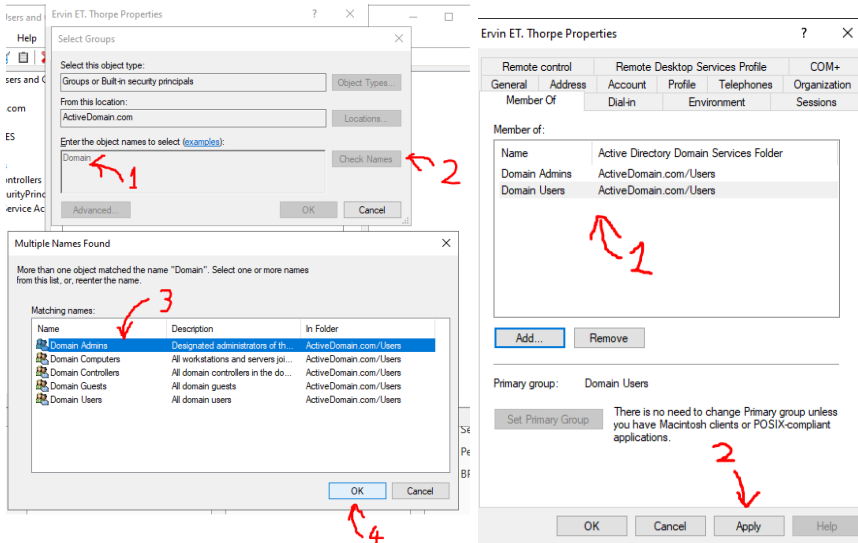
- Setup a password
- then go next
- Tick "Password never expires"



- We'll now setup a domain for this account
- Right click the account > Properties



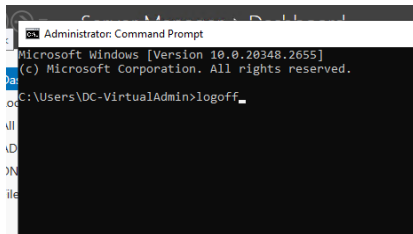
- Go to Member Of
- Then click Add...



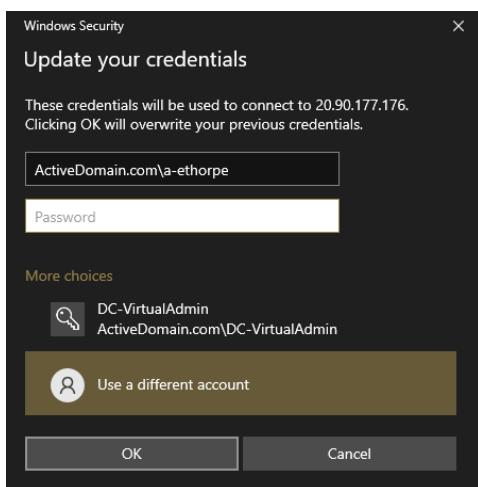
- Type in "Domain"
- Click Check Names
- Look for "Domain Admin"
- Click OK then click OK again
- You will then see that Domain Admin has been added. New user is now a domain admin.

## 3.5 Logging in as Admin

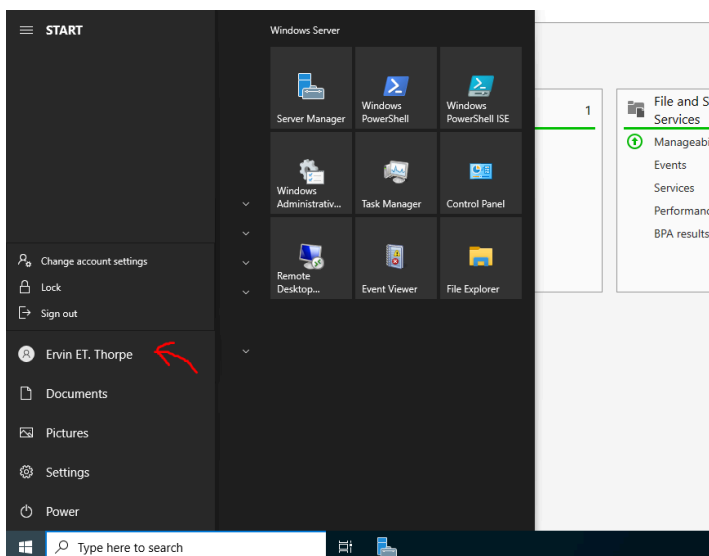
For this section, we're going to test to see if we can log in as our new admin account.



First we'll just log off. We can do this from the command prompt.



- Now we'll want to log in as our admin account. This is done by domainName\adminName



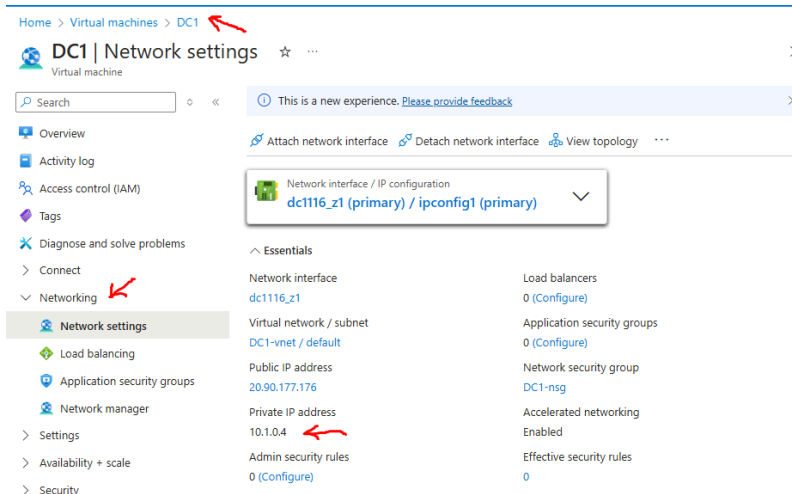
- We're now logged in as our admin account!



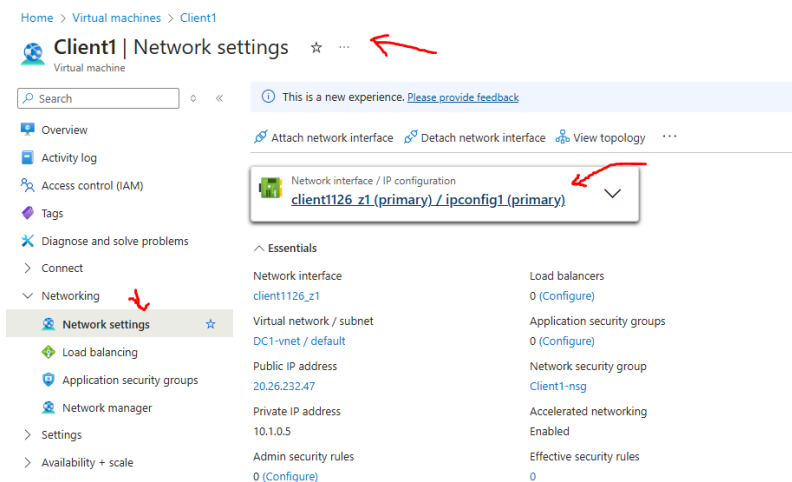
## 4 Setting up Client VM

For this section, I'll be setting up the Client Virtual Machine. Configuring and testing the DNS of this machine and having this client connect to the active directory virtual machine. In order for this Client's machine to connect to the domain controller, we'll have to have them be the same DNS.

### 4.1 Matching the DNS server



- Go to DC VM
- Go to Networking > Network settings > Copy Private IP Address



- Go to Client1 VM
- Go to Networking > Network settings > Select the Network Interface

Home > Virtual machines > Client1 | Network settings > client1126\_z1

## client1126\_z1 | DNS servers

Network interface

Search

Save Discard

Overview

Activity log

Access control (IAM)

Tags

Settings

IP configurations

**DNS servers**

Network security group

Properties

Locks

Monitoring

Automation

Help

Updating the DNS servers for this network interface may restart applicable, any other virtual machines in the same availability set.

DNS servers

☐ Inherit from virtual network ☒ Custom

DNS server

10.1.0.4

Add DNS server

Applied DNS servers

For virtual machines in an availability set, the list of applied DNS servers is the union of all DNS servers from all network interfaces that are a part of the availability set.

Applied DNS servers

No results

- A number of steps here..
- 1. Make sure you're on the Network Interface
- 2. Go to DNS Servers
- 3. Select Custom
- 4. Type in or paste the private IP address we copied earlier for the DNS server
- 5. Save

Home > Virtual machines >

## Client1

Virtual machine

Search

Connect Start Restart Stop Hibernate Capture Delete

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Connect

Networking

Network settings

Load balancing

Application security groups

Network manager

Settings

Availability + scale

Essentials

Resource group (move)

DC-RG

Status

Running

Location

UK South (Zone 1)

Subscription (move)

Azure subscription 1

Subscription ID

cbf2dd79-9058-44bb-ad1d-49eea109434f

Availability zone

1

Tags (edit)

Add tags

JSON View

Operating system

Windows (Windows 10 Pro)

Size

Standard DS1 v2 (1 vcpu, 3.5 GiB memory)

Public IP address

20.26.232.47

Virtual network/subnet

DC1-vnet/default

DNS name

Not configured

Health state

-

Time created

8/25/2024, 7:20 PM UTC

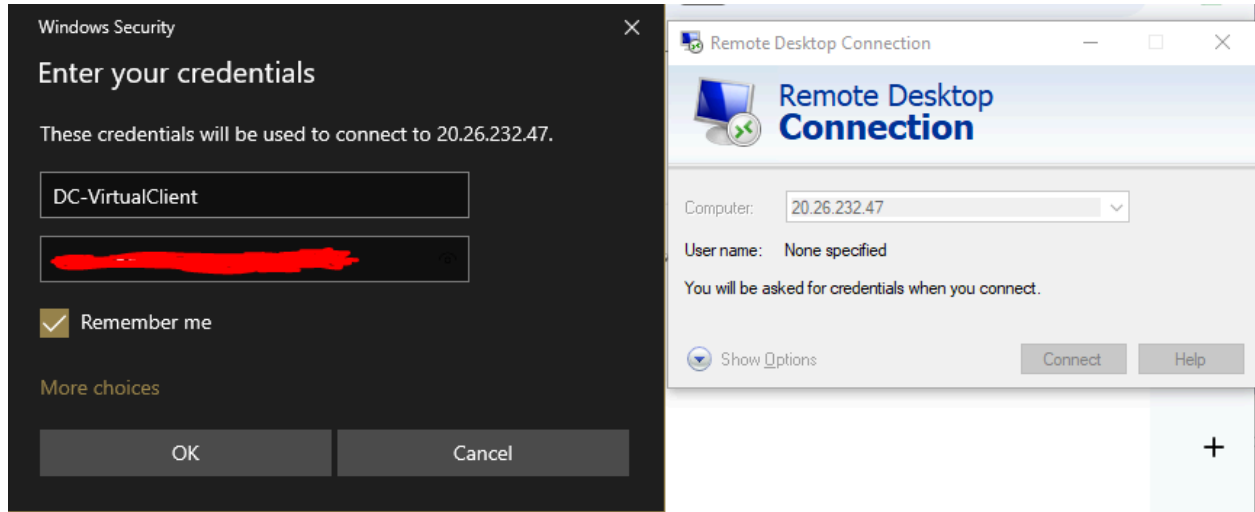
Restarting virtual machine

Restarting the virtual machine 'Client1'...

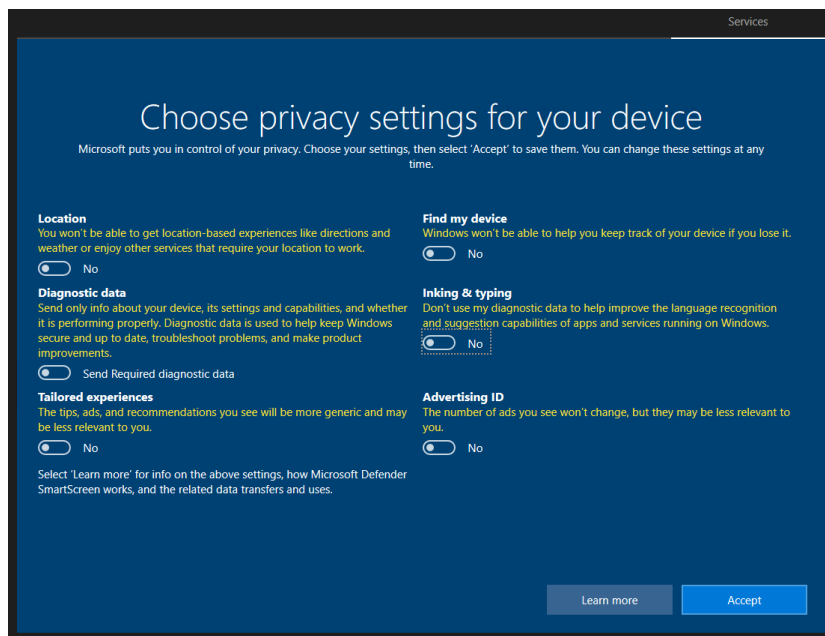
- Now go back to our Client1 VM
- Restart it. This is because we set up a new DNS server. We'll want to restart it to deploy the new changes.

## 4.2 Observing the DNS changes

To observe to see if these DNS changes worked, we'll have to now remote access our client VM.



- Type in the client machine username and password
- Click OK



- Select No to all and accept. We don't want to overload our VM when we already have low resources.

```
Select Administrator: Command Prompt
Microsoft Windows [Version 10.0.19045.4780]
(c) Microsoft Corporation. All rights reserved.

C:\Users\DC-VirtualClient>ipconfig /all

Windows IP Configuration

Host Name . . . . . : Client1
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . . : ylralkkgdu3e3njkr4czlvdth.zx.internal.cloudapp.net

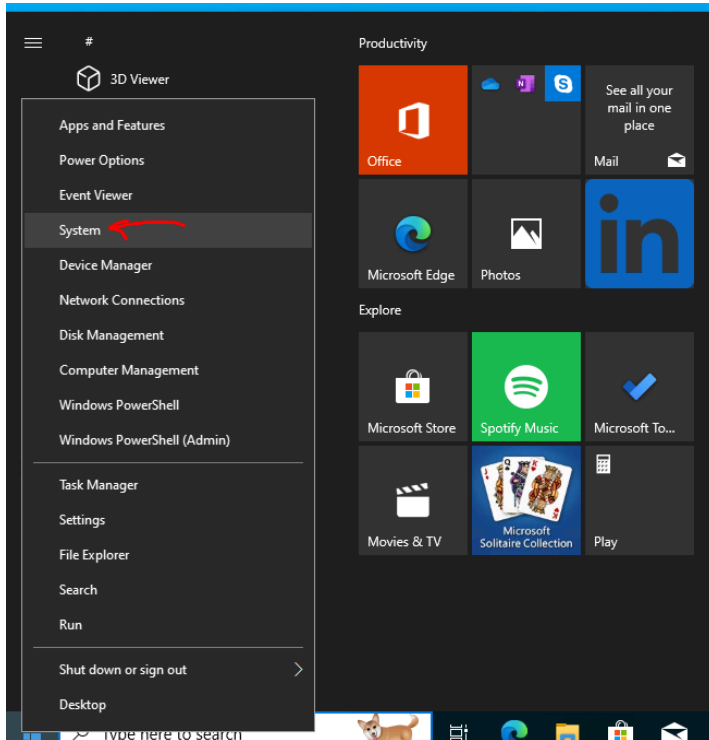
Ethernet adapter Ethernet:

Connection-specific DNS Suffix . : ylralkkgdu3e3njkr4czlvdth.zx.internal.cloudapp.net
Description . . . . . : Microsoft Hyper-V Network Adapter
Physical Address. . . . . : 00-22-48-41-FD-B2
Dhcp Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::53eb:636a:6ffd:f412%4(Preferred)
IPv4 Address. . . . . : 10.1.0.5(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Lease Obtained. . . . . : Monday, August 26, 2024 12:09:18 AM
Lease Expires . . . . . : Thursday, October 2, 2160 6:48:37 AM
Default Gateway . . . . . : 10.1.0.1
DHCP Server . . . . . : 168.63.129.16
DHCPv6 IAID . . . . . : 100672072
DHCPv6 Client DUID. . . . . : 00-01-00-01-2E-5C-DA-99-00-22-48-41-FD-B2
DNS Servers . . . . . : 10.1.0.4
NetBIOS over Tcpip. . . . . : Enabled
```

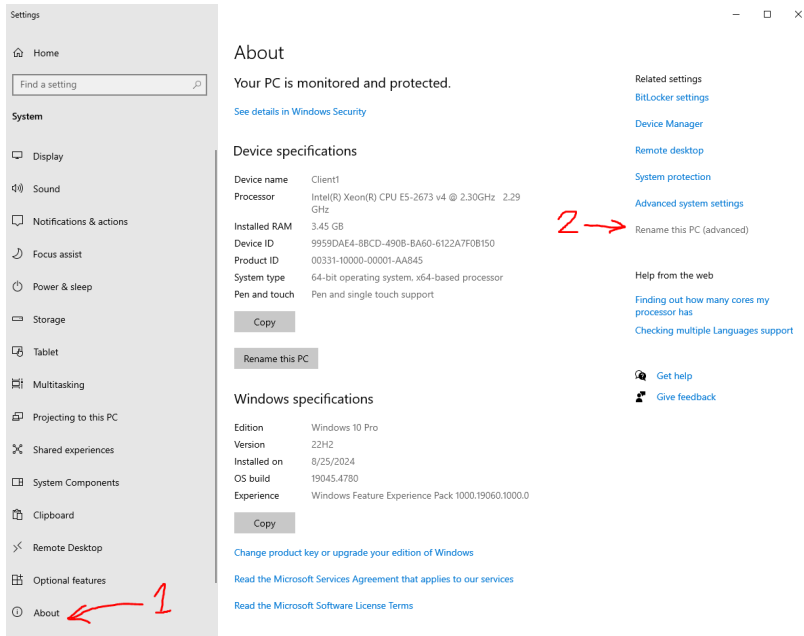
- Open Command Line as Administrator
- Type in “ipconfig /all”
- From here, we can see that the DNS servers have been set the way we intended.

## 4.3 Having a Client connect to the Active Directory VM

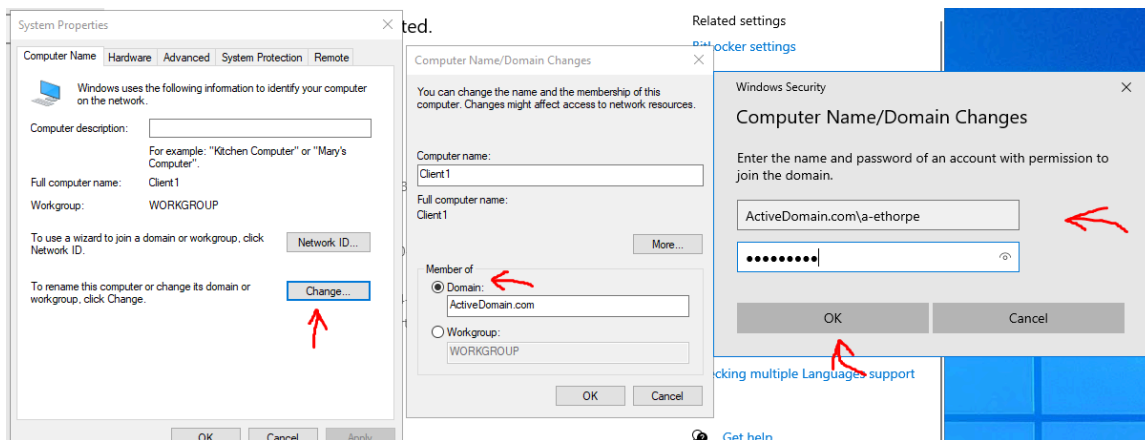
Now we’re going to try to connect the client VM to the Active Directory VM



- Right click the Start button > Select System

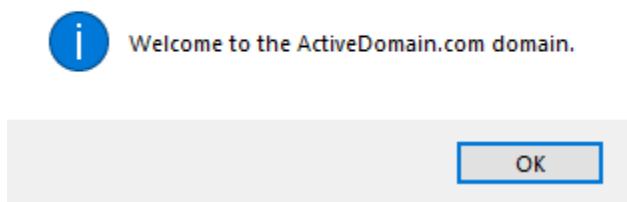


- Select About
- Then Select “Rename this PC (preferred)”

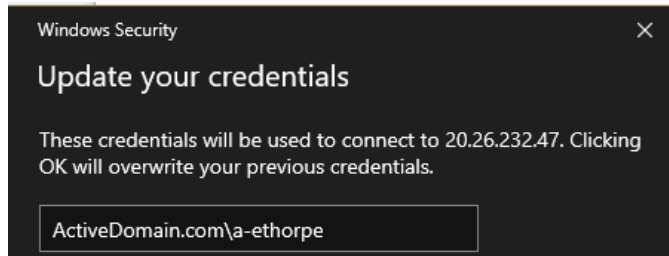


- Select Change
- Select “Domain”, type in the domain, press OK
- Then type in the credentials of one of the accounts. I'll use the admin account.

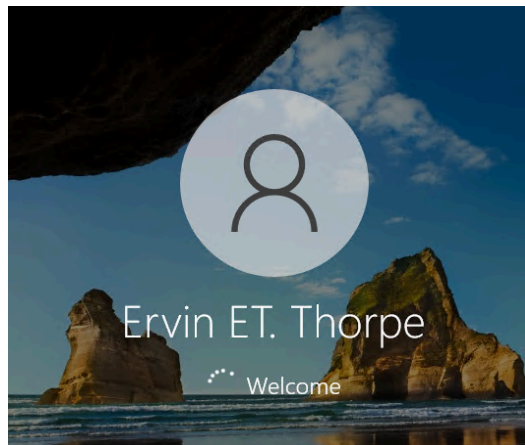
Computer Name/Domain Changes



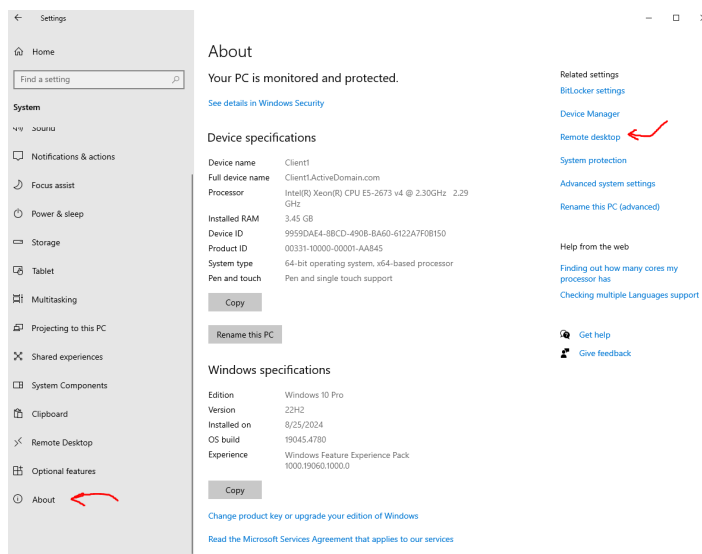
- If done correctly, you'll get this



- Now we'll try to access the Active Domain with our admin account that exists in the active directory for the Client1 machine



- Now we're logging in as our admin account



- Now we're going to have any user within our Active Directory be able to connect to this client1 machine.
- Go to About > Remote Desktop

## Remote Desktop

Remote Desktop lets you connect to and control this PC from a remote device by using a Remote Desktop client (available for Windows, Android, iOS and macOS). You'll be able to work from another device as if you were working directly on this PC.

Enable Remote Desktop

☒ On

☒ Keep my PC awake for connections when it is plugged in

☒ Make my PC discoverable on private networks to enable automatic connection from a remote device

[Show settings](#)

[Show settings](#)

[Advanced settings](#)

### How to connect to this PC

Use this PC name to connect from your remote device:  
Client1.ActiveDomain.com

[Don't have a Remote Desktop client on your remote device?](#)

### User accounts

[Select users that can remotely access this PC](#)

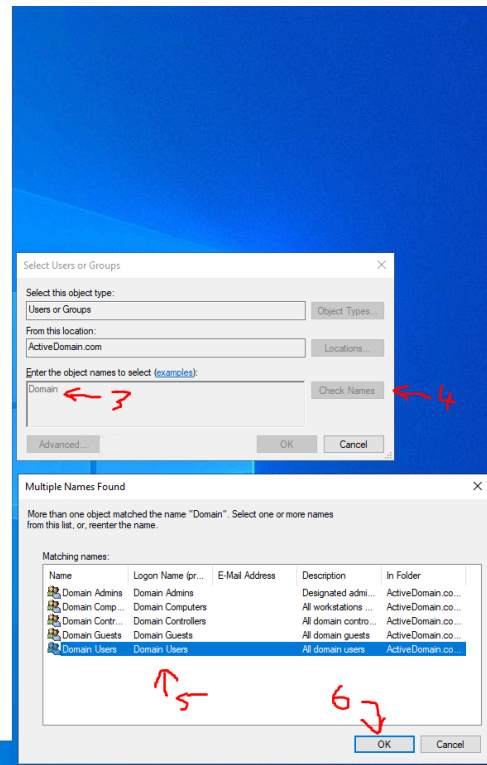
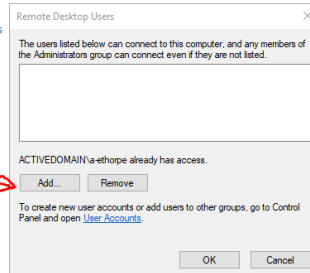
Help from the web

[Solving PC problems remotely](#)

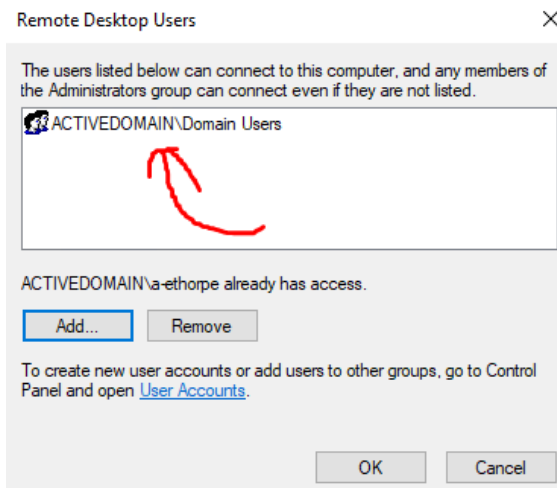
[Setting up remote desktop](#)

[Get help](#)

[Give feedback](#)



- Go to "Select users that can remotely access this PC"
- Then select "Add..."
- Then type "Domain"
- Go to "Check Names"
- Then select "Domain Users" - that will be all users, including admin
- Click OK



- As we can see, our Domain Users has been added.
- The benefits of this is that it allows any user to access this machine. This has plenty of benefits and I plan on building onto this in the distant future to showcase how it can help in a real world case.

## 5 Conclusion

In this project, I successfully deployed an on-premises Active Directory environment using Microsoft Azure Virtual Machines. The key accomplishments include:

1. Setting up Azure Virtual Networks and creating two Virtual Machines: a Windows Server 2022 for the Domain Controller and a Windows 10 client machine.
2. Configuring the Windows Server VM by enabling necessary firewall rules and installing Active Directory Domain Services.
3. Promoting the server to a domain controller and establishing a new forest with a root domain.
4. Creating organisational units and setting up administrative accounts within the Active Directory structure.
5. Configuring the client VM to connect to the domain by adjusting its DNS settings and joining it to the Active Directory domain.
6. Enabling remote desktop access for domain users on the client machine.

This hands-on experience has provided me with valuable insights into cloud-based infrastructure management, Active Directory deployment, and network configuration within the Azure ecosystem.

Moving forward, I plan to build upon this foundation by exploring DNS management. The next section of this project will focus on configuring and managing DNS services using the existing Azure Virtual Machines (Windows Server 2022 and Windows 10), DNS Manager, and Command Prompt. This will allow me to gain a deeper understanding of name resolution, zone management, and the critical role DNS plays in network infrastructure and Active Directory environments.

By continuing to develop these skills, I am enhancing my expertise in enterprise-level identity and access management, as well as some basic network administration in cloud environments.