

## **Implementation and Configuration of Active Directory Domain services in a Windows Server Environment**

This project explains how Active Directory Domain Services (AD DS) was implemented and configured on a Windows Server to manage users and computers within a network. The server was set up as a domain controller to provide centralized authentication and administration for Windows 7 and Windows 8 client machines on the same network. The process involved installing the AD DS role, promoting the server to a domain controller, and organizing users and groups to represent different departments

### **What You'll Need:**

- Windows 7 virtual machine
- Windows 8 virtual machine
- Windows Server (Active Directory Domain Controller)

### **What is an AD?**

An Active Directory is a directory service that stores information in a database, used by IT teams to manage what users can do on a network.

In an Active Directory, many objects are stored:

- User's accounts, which store login credentials and user-related attributes
- Computer accounts, each having a unique identifier on the domain
- Security and distribution groups, used to assign permissions and manage access.
- GPO (Group Policy Object), controls what the users see or do on the computers.
- Domain Controller, which hosts Active Directory Domain Services (AD DS) and is responsible for handling user authentication, authorisation, and directory services. (can have more than one domain controller if need be)

-

Active Directories are easily scalable, allowing organisations to manage a growing number of users and devices efficiently through the use of organisational units and group-based management.

### **Why do Organisations Use it?**

AD is a service for securing and managing access to a business's network, servers and applications. AD ensures that right users have access to the right resources based on their role within the organisation.

For example, if an employee has been moved to a different department. Their user account can easily be reassigned to a new group or organisational unit. This allows administrators to update permissions quickly and consistently without manually reconfiguring access on individual systems. As a result, AD improves security, and efficiency in company/enterprise environments.

### **Purpose of this project.**

To gain a practical understanding on managing active directory within a window-server environment.

The project aims to develop a clear understanding of how AD is used in real-world organisations to centrally manage users, groups, computers, and networking policies.

### **Steps for configuring Active Directory:**

1. Configure the VLAN and make all devices (windows 8 and 7) including the server on the same subnet
2. Start all the devices including the server
3. On the server, start the server dashboard
4. Install an active directory
5. Promote the active directory server to a domain controller
6. Login as an administrator
7. Create three organizational units; HR, IT and audit
8. Create groups within each organizational unit
9. Add users to the group and configure each user.

### **Network Design:**

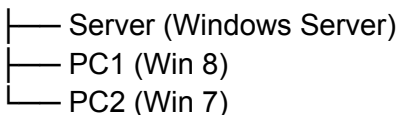
Internet



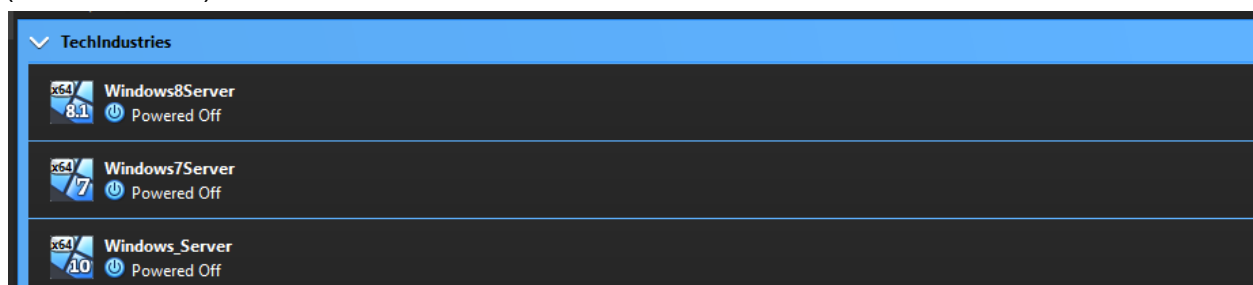
Router (192.168.1.1)



Switch



Configured Windows 8 and 7 server, with a windows server as well. All under the same group (TechIndustries):



### **What is a VLAN?**

VLAN stands for virtual local area network, it is a virtualized connection linking multiple devices and network nodes from different LANs into one logical network. - (Solar Winds)

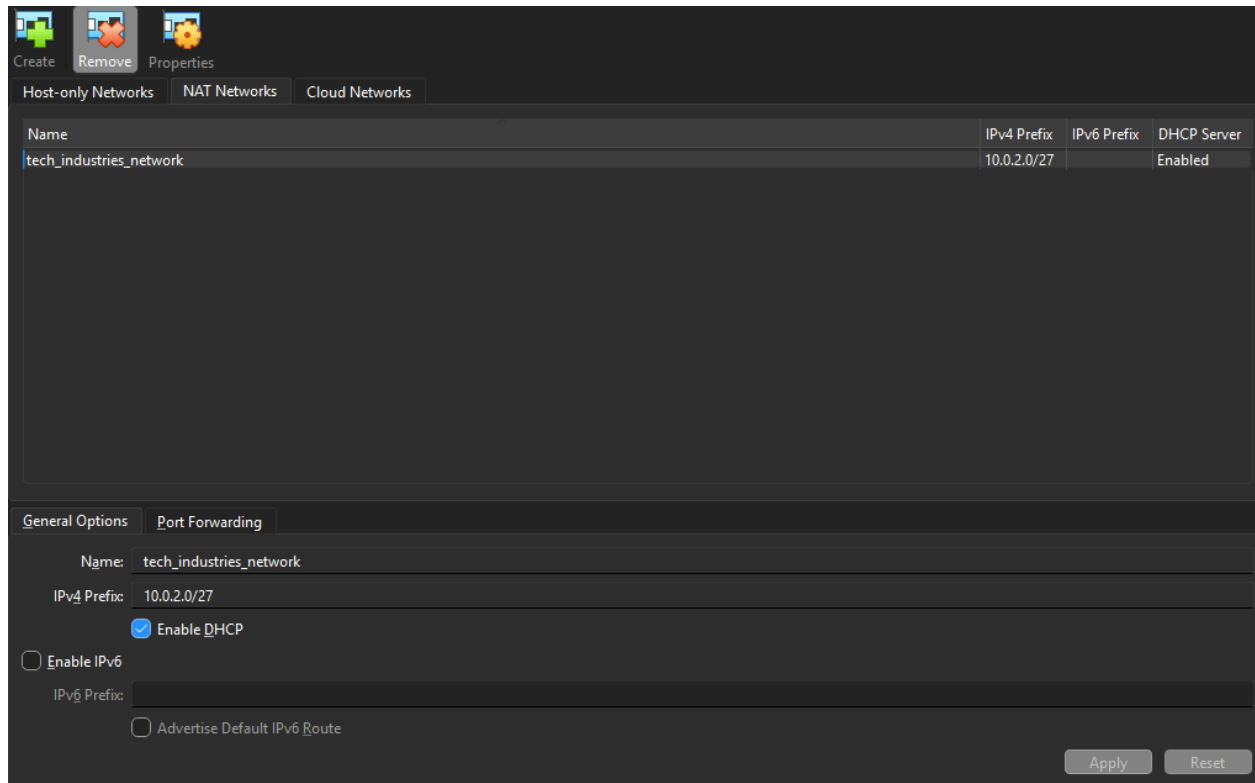
In simpler terms, a VLAN lets you split one physical network into multiple isolated networks using software configuration instead of extra hardware.

In this project, a single VLAN and subnet were configured to ensure communication between the windows server domain controller and Windows 7 and Windows 8 virtual machines.

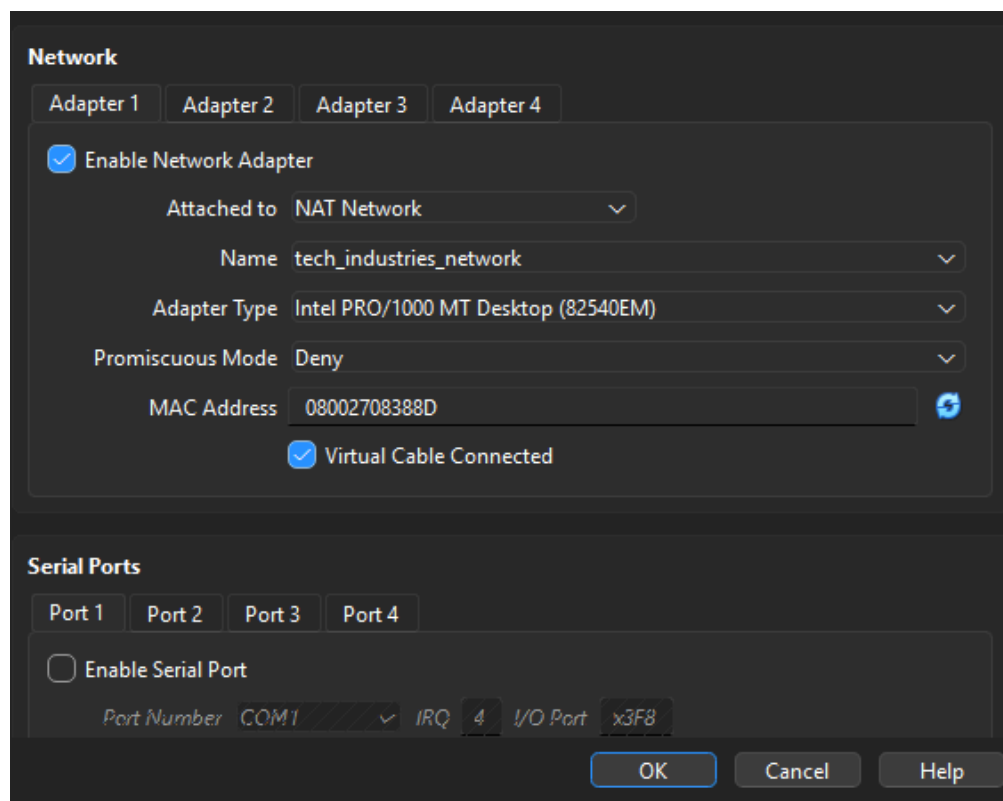
This setup provided a controlled environment for implementing and testing Active Directory services.

### **Step 1 - Configure the VLAN and make all devices (windows 8 and 7) including the server on the same subnet**

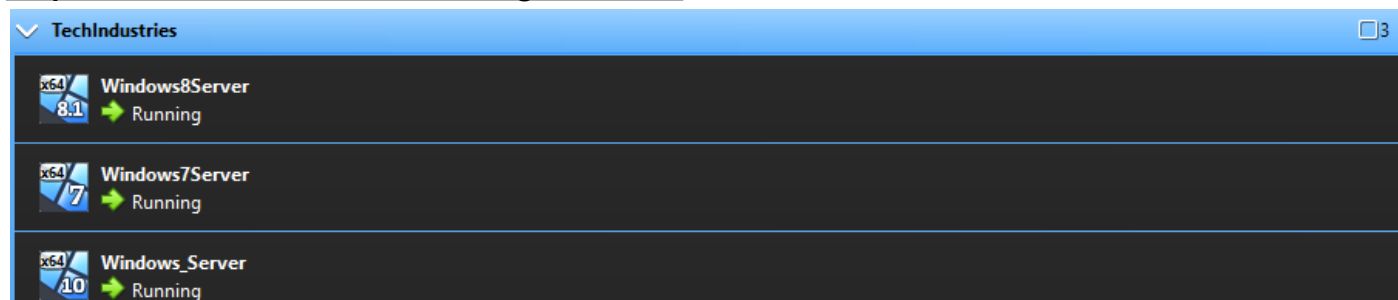
Created a NAT network:



Connecting the Windows 8, 7 virtual machines and the Windows Server to the same network:

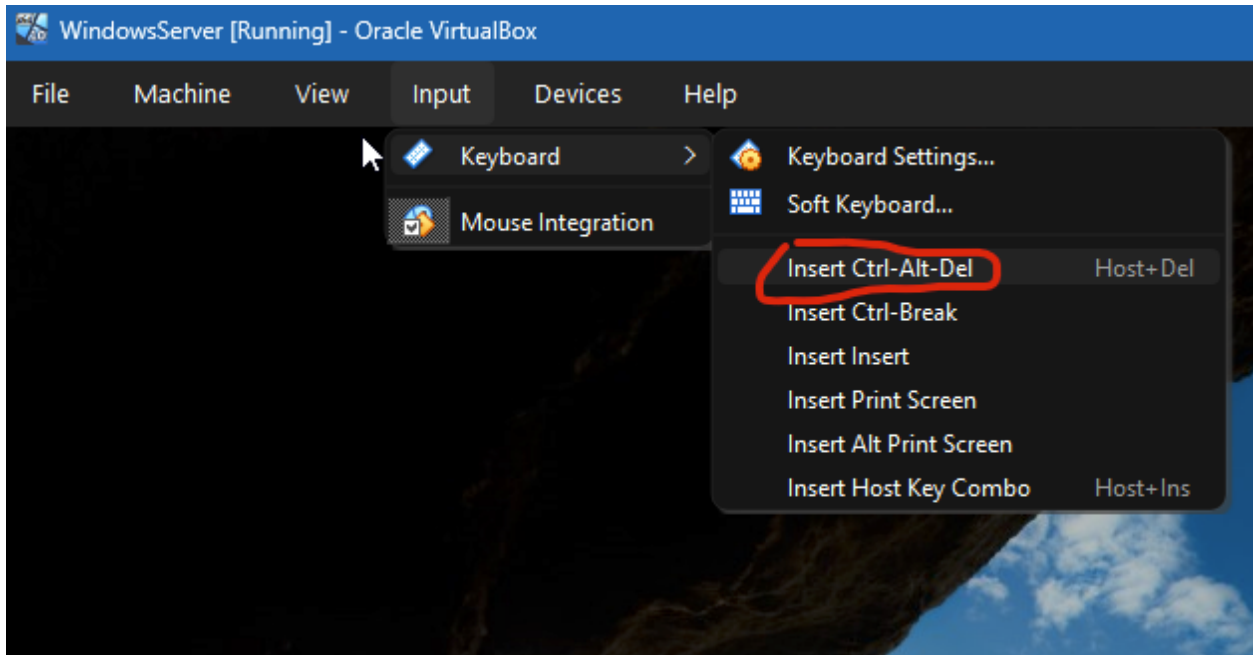


## **Step 2 - Start all the devices including the server**

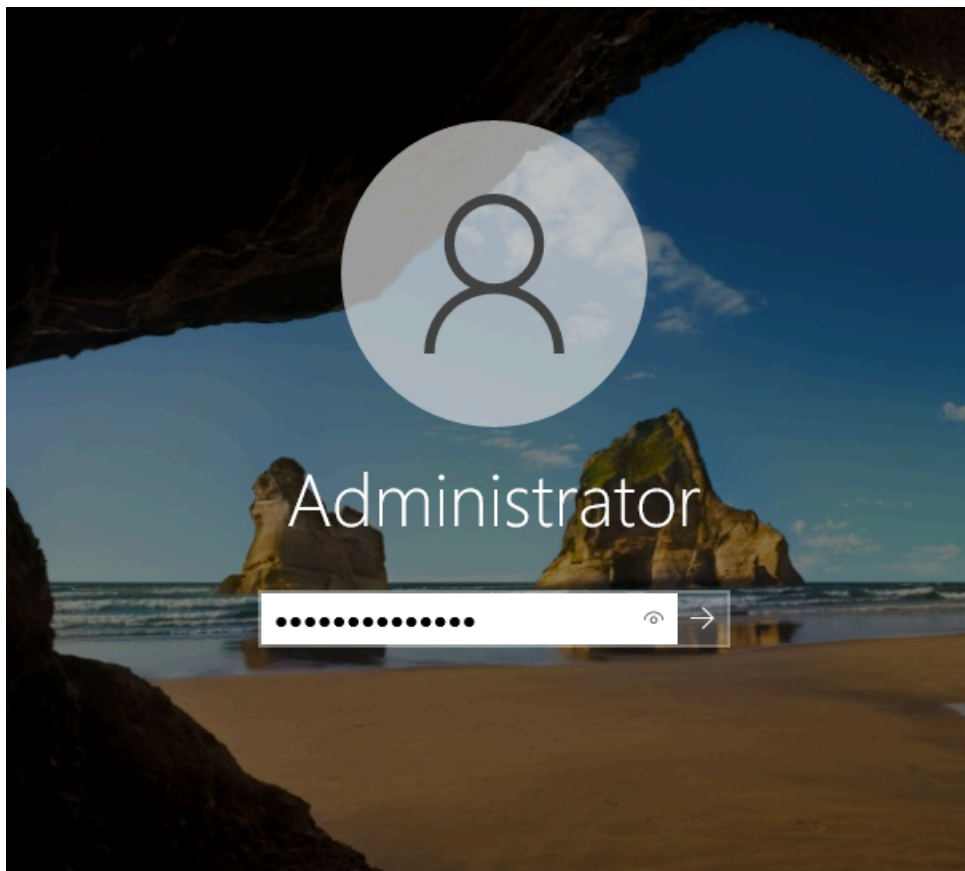


## **Step 3 - On the server, start the server dashboard**

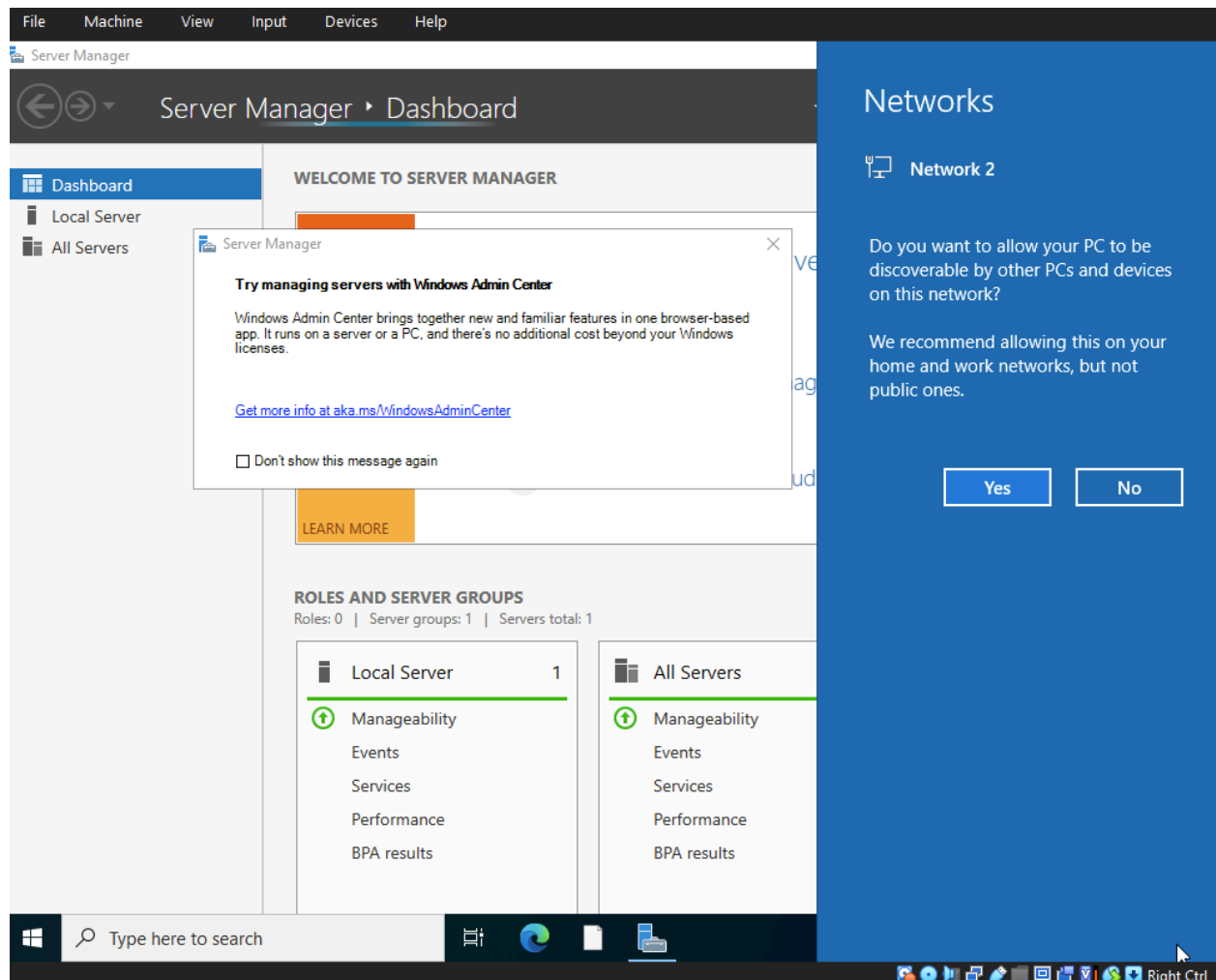
I was prompted to press “Ctrl+Alt+Del”, at the top I clicked “Input”, then hovered over the keyboard and scrolled down to click “Insert Ctrl+Alt+Del”. As shown in the screenshot below:



Entered Password:



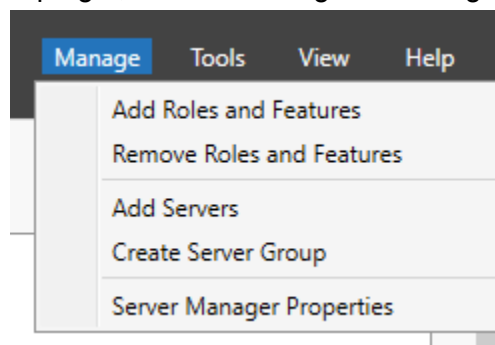
Logged into Server Manager (Popped up immediately after login):  
*Make sure to click “Yes”*



If nothing popped up, click the windows key and navigate to "Server Manager"

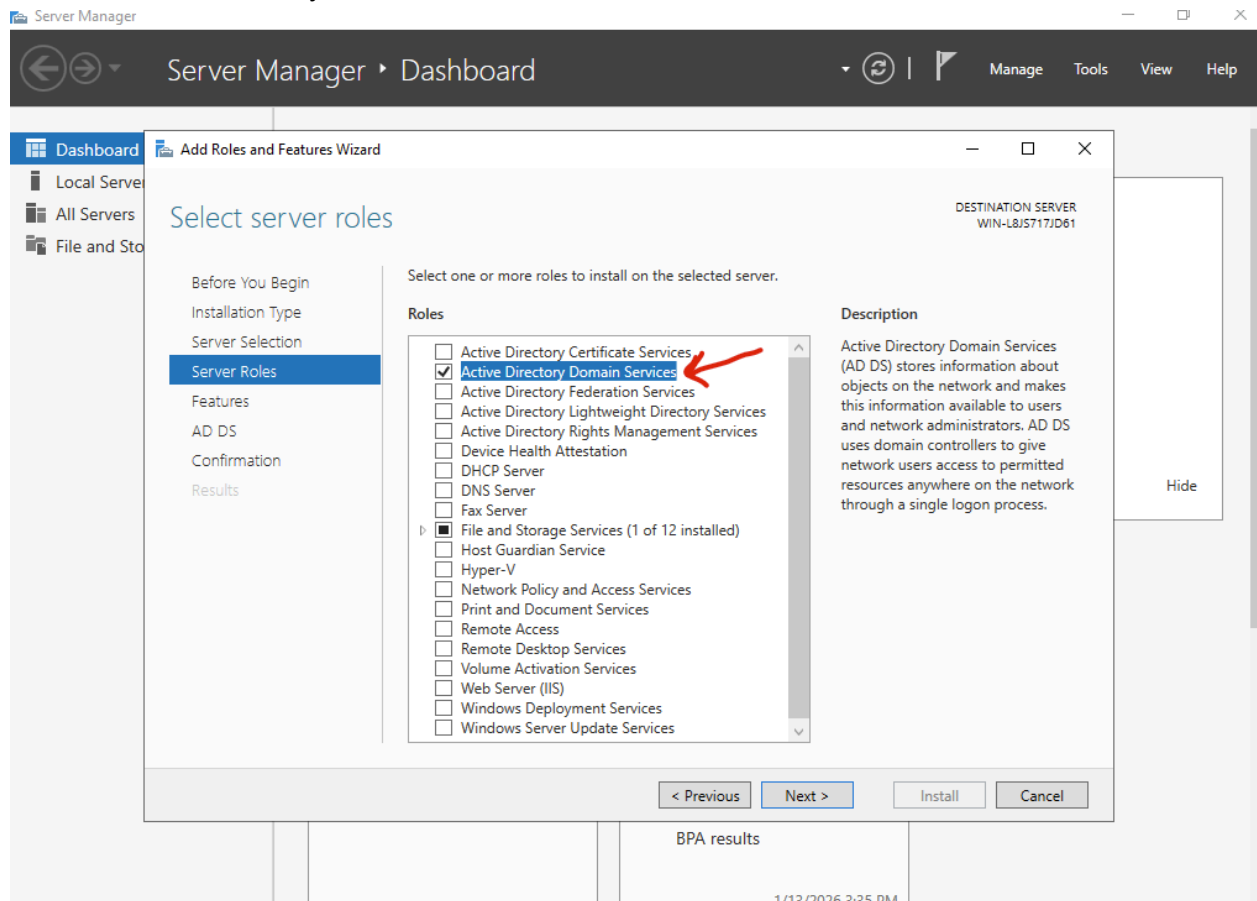
#### **Step 4 - Install and configure the active directory**

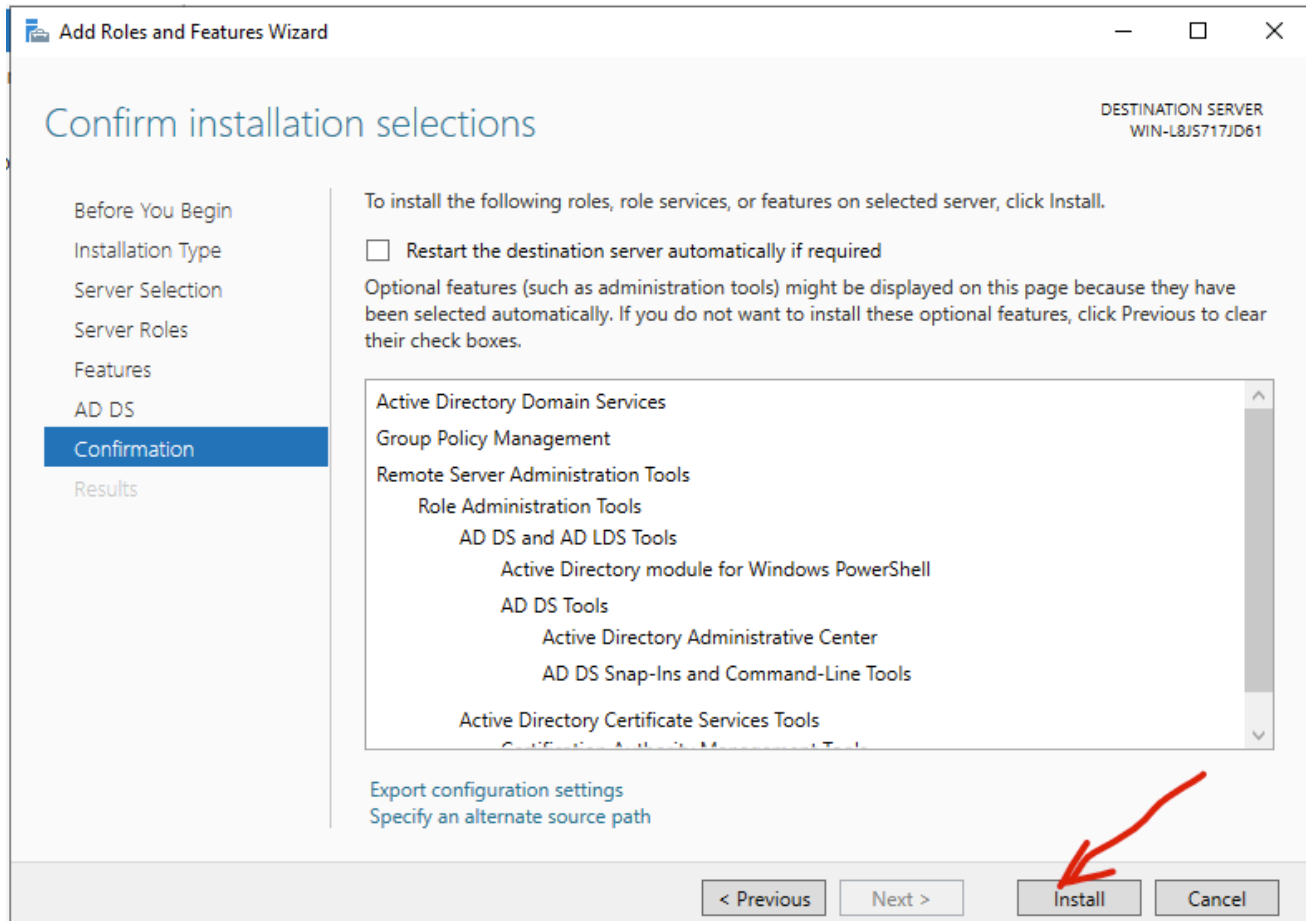
Top right, click on manage and navigate to “Add Roles and Features”



Steps to do when prompted with this window:

- Click Next Until you reach “Server Roles”
- Click on “Active Directory Domain services” - “Add Features”
- Click Next Until you reach confirmation, then click on “Install”



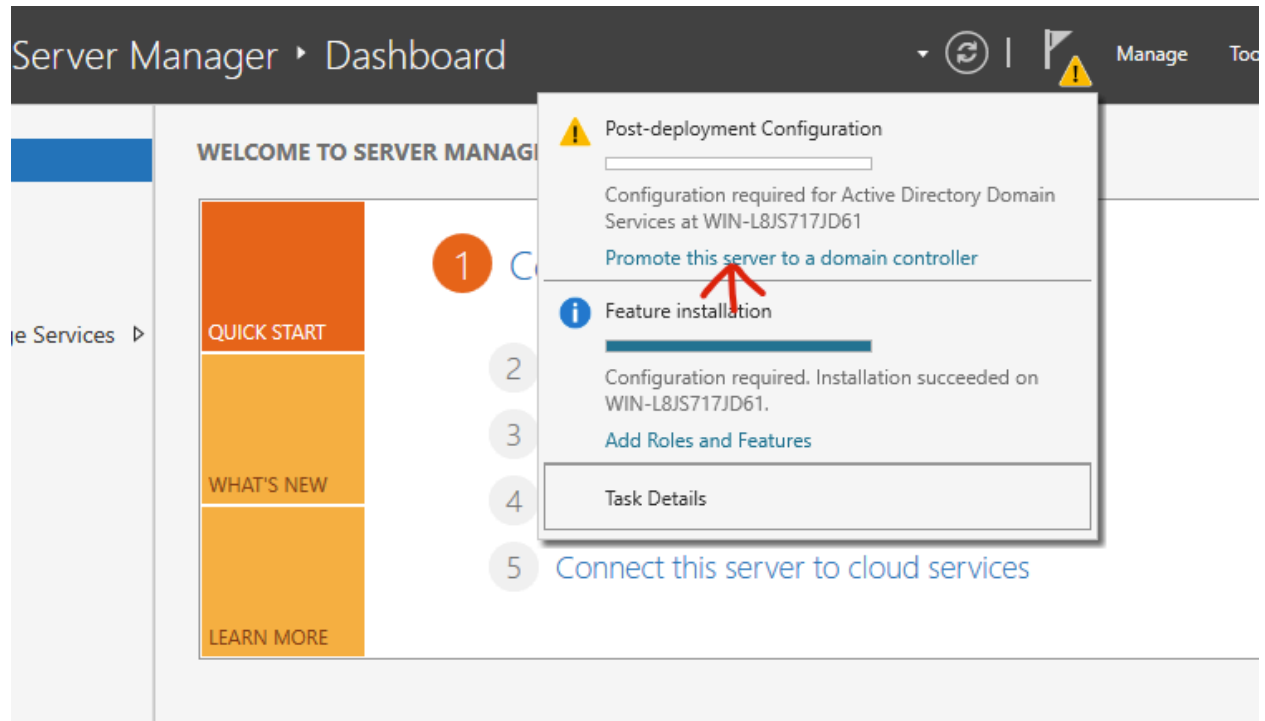


Once Installed, move on to the next step

### **Step 5 - Promote the active directory server to a domain controller**

Top right of the dashboard, click the flag icon with a hazard warning next to it:





Then a window will pop up:

- In this window click "Add a new forest" as one of the options
- Name your root domain name in the box
- Click on Next

Active Directory Domain Services Configuration Wizard

Deployment Configuration

TARGET SERVER  
WIN-L8JS717JD61

Deployment Configuration

Domain Controller Options

Additional Options

Paths

Review Options

Prerequisites Check

Installation

Results

Select the deployment operation

☐ Add a domain controller to an existing domain

☐ Add a new domain to an existing forest

☒ Add a new forest

Specify the domain information for this operation

Root domain name:

[More about deployment configurations](#)

< Previous

Next >

Install

Cancel

After clicking next:

- Input a password
- Click Next until Installation phase
- This will reboot after installation has finished

## Domain Controller Options

TARGET SERVER  
WIN-L8JS717JD61

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: \*

Confirm password: \*

[More about domain controller options](#)

< Previous

Next >

Install

Cancel

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

The NetBIOS domain name: TECHINDUSTRIES

[More about additional options](#)

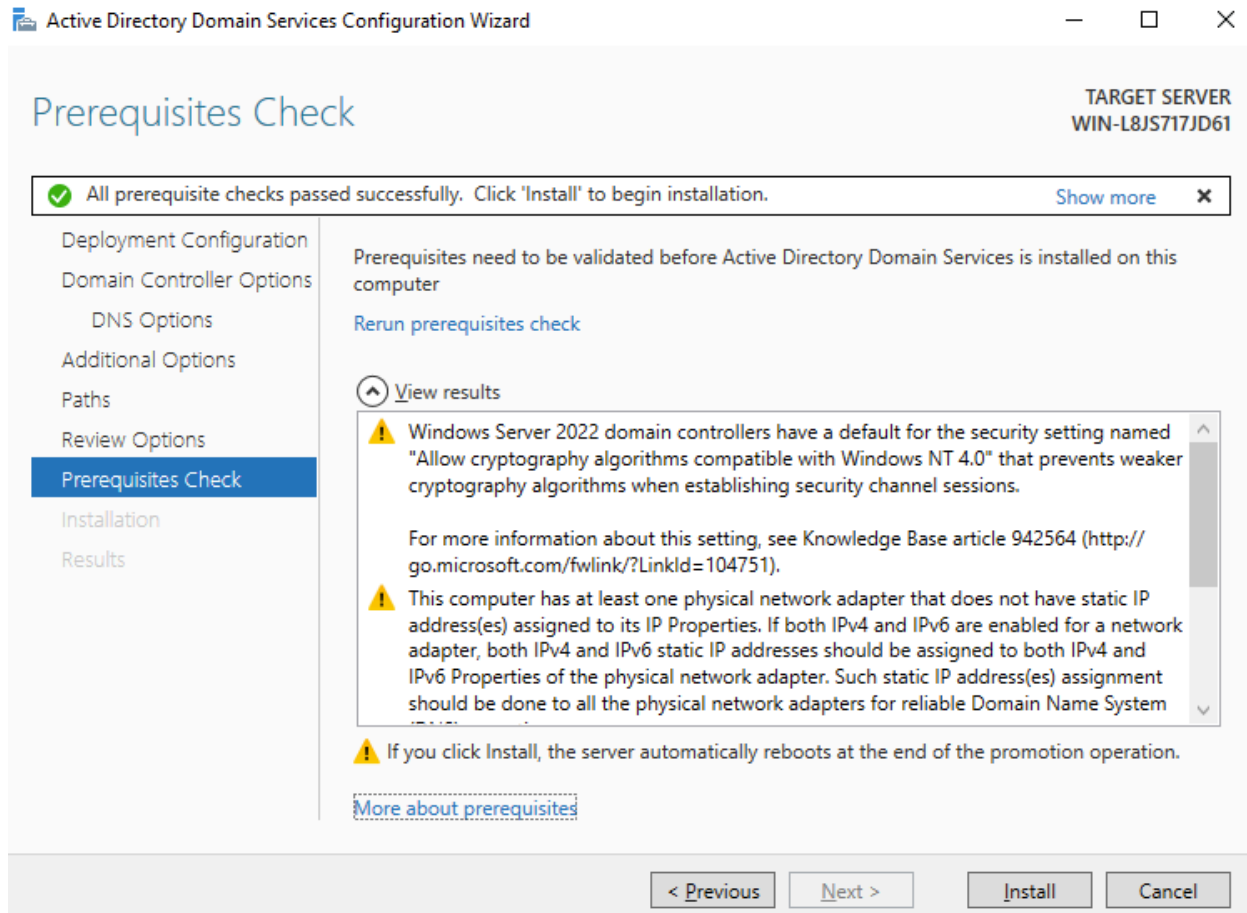
< Previous

Next >

Install

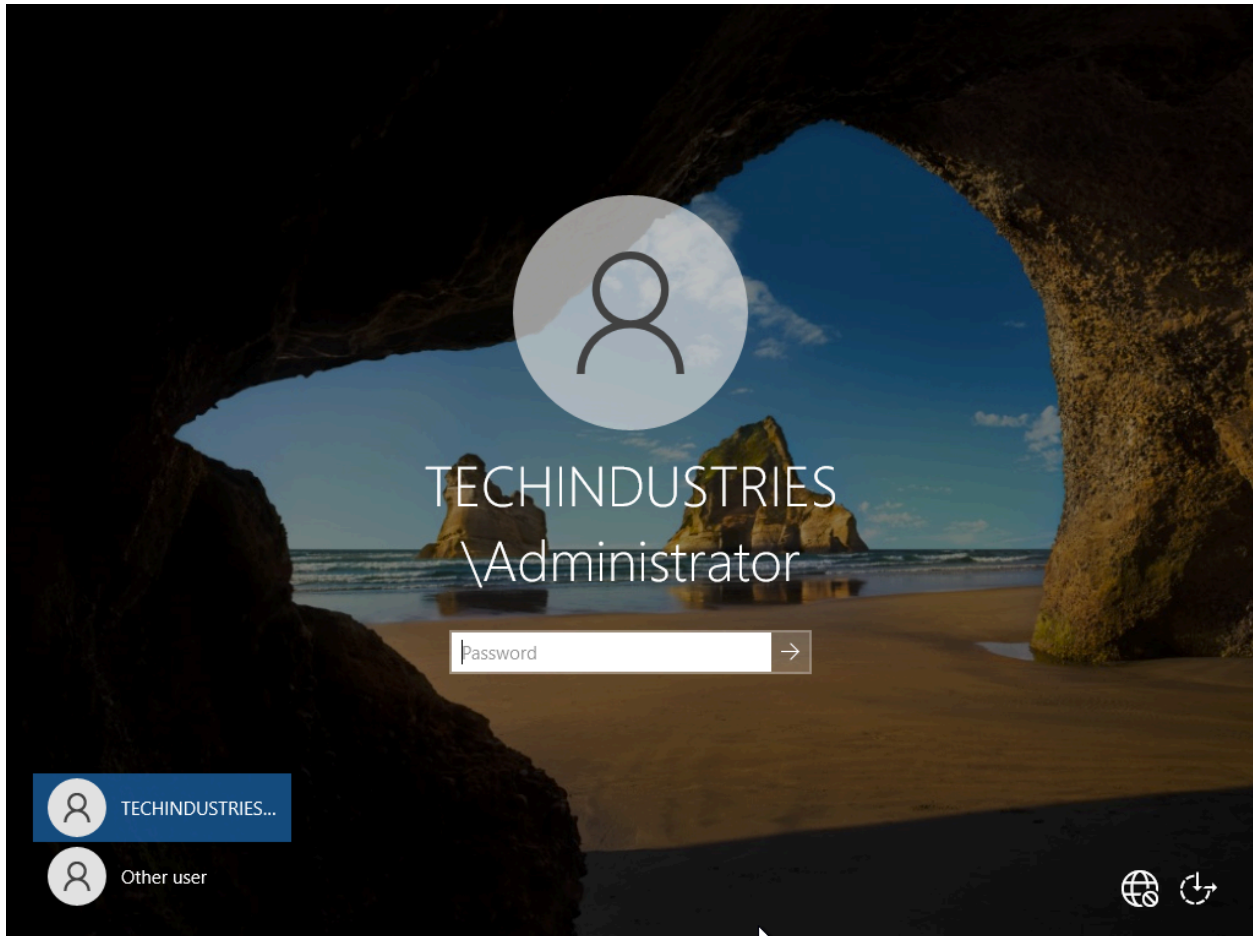
Cancel

Domain name ^



## **Step 6 - Login as the administrator**

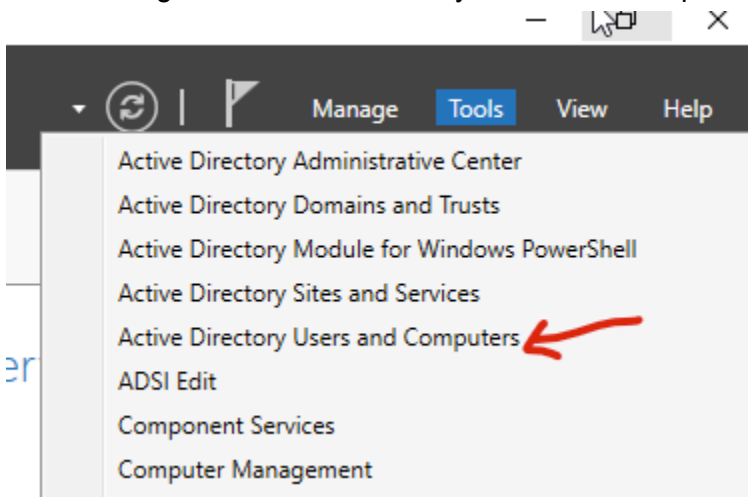
After the reboot, It will prompt you to sign in as an administrator.  
Enter the password that was used during the installation process.  
As shown in this screenshot:



### **Step 7 - Create three organizational units: HR, IT and audit**

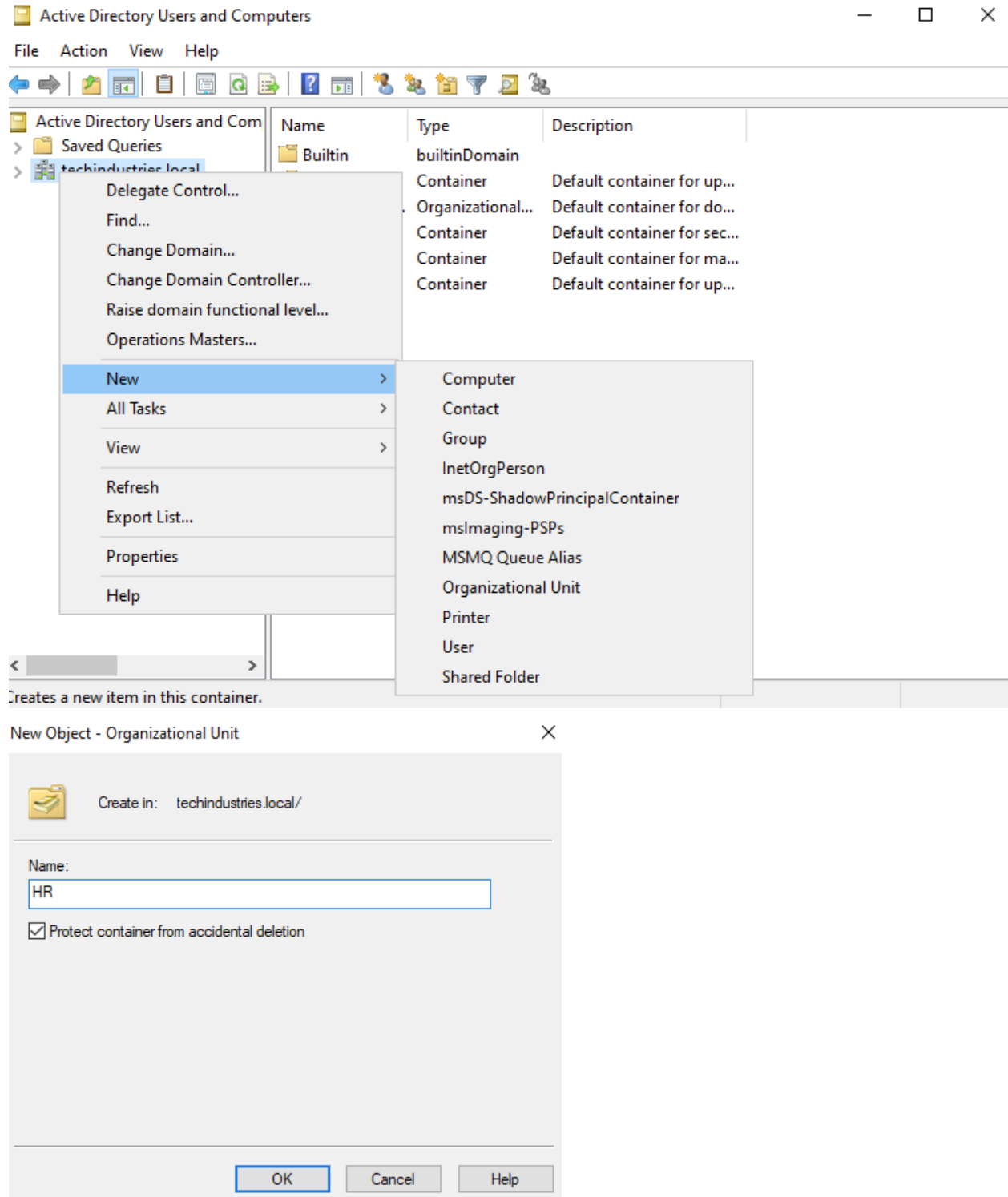
In the top right, click tools:

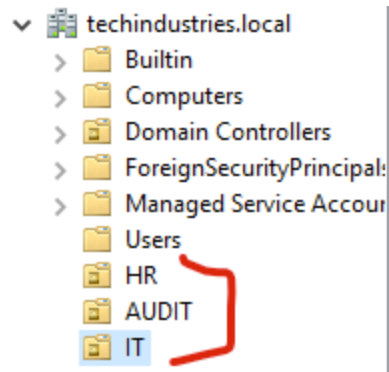
- Navigate to "Active Directory Users and Computers"



Once window has popped up:

- Right click on the domain you have created
- Hover over new - Then click "Organizational Unit"
- Name the OUs - HR, Audit and IT

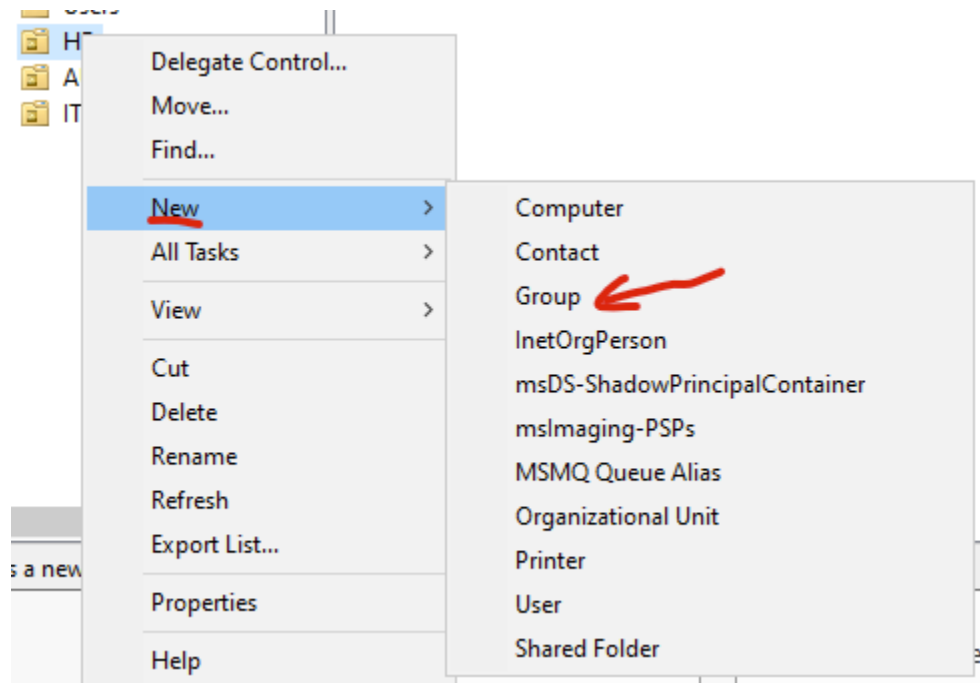




### **Step 8 - Create groups within each organizational unit**

Hover over to the HR OU:

- Right Click and hover over New
- Then click "Group"
- Name the groups however you may like
- Repeat this process for IT OU



New Object - Group

Create in: techindustries.local/HR

Group name:  
EMPLOYMENT DOCUMENTS

Group name (pre-Windows 2000):  
EMPLOYMENT DOCUMENTS

Group scope

☐ Domain local  
☒ Global  
☐ Universal

Group type

☒ Security  
☐ Distribution

OK Cancel

	Name	Type	Description
Active Directory Users and Com			
> Saved Queries			
▼ techindustries.local			
> Built-in			
> Computers			
> Domain Controllers			
> ForeignSecurityPrincipal:			
> Managed Service Account			
Users			
HR	EMPLOYME...	Security Group...	
AUDIT	PAY ROLL	Security Group...	
IT			

File Action View Help

	Name	Type	Description
Active Directory Users and Com			
> Saved Queries			
▼ techindustries.local			
> Built-in			
> Computers			
> Domain Controllers			
> ForeignSecurityPrincipal:			
> Managed Service Account			
Users			
HR	SECURITY TE...	Security Group...	
AUDIT	SOFTWARE ...	Security Group...	
IT			



### **Step 9 - Add users to the group and configure each user**

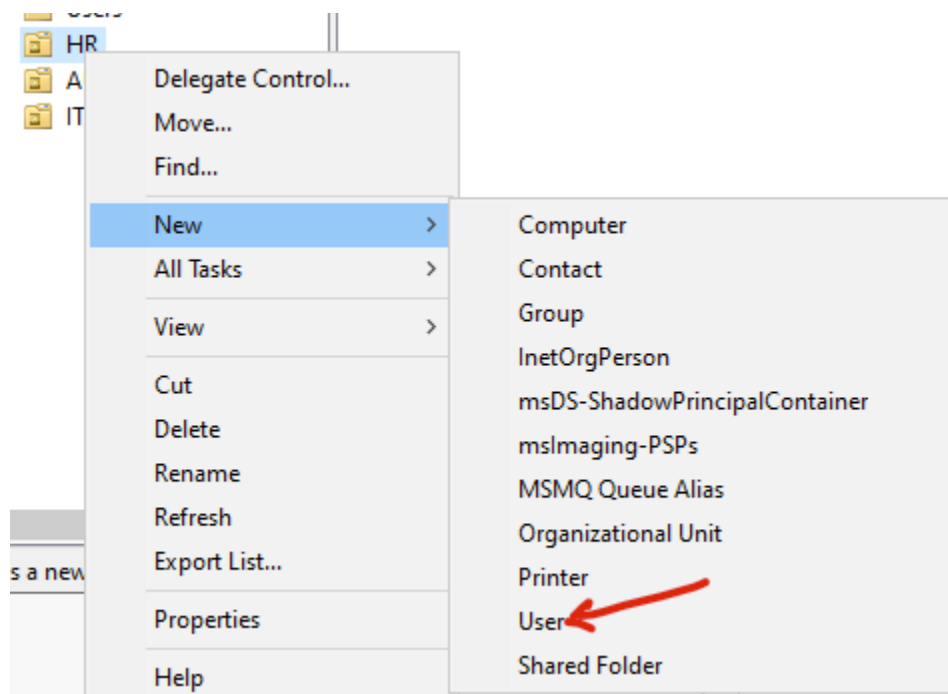
In this step, we are adding users to the groups of the windows server. Windows 7 and 8 virtual machines will be used in this step.

Windows 7 - HR users

Windows 8 - IT users


Navigate to the HR OU:

- Right click, hover over "New" - click "User"
- Enter User credentials (Name, Last name etc)
- User logon name - end with .HR to distinguish from other user groups
- Click Next - Prompted with 4 options
  - First
  - Second
  - Third
  - Fourth
- Click Next
- Click Finish



New Object - User



 Create in: techindustries.local/HR

---

First name:

Initials:

Last name:

Full name:

User logon name:

User logon name (pre-Windows 2000):


< Back

Next >

Cancel

New Object - User



 Create in: techindustries.local/HR

---

Password:

Confirm password:

☐ User must change password at next logon

☐ User cannot change password

☒ Password never expires

☐ Account is disabled

< Back

Next >

Cancel

## New Object - User



Create in: techindustries.local/HR

When you click Finish, the following object will be created:

Full name: Micheal MC. Celestial

User logon name: Micheal.HR@techindustries.local

The password never expires.

< Back

Finish


Cancel

Name	Type	Description
EMPLOYME...	Security Group...	
Micheal MC....	User	
PAY ROLL	Security Group...	

The User (Micheal Celestial) has been created in HR.  
Repeat this Process but for IT:

New Object - User



 Create in: techindustries.local/IT

---

First name:

Valerie

Initials:

VL

Last name:

Leo

Full name:

Valerie VL. Leo

User logon name:

Valerie.IT

@techindustries.local

User logon name (pre-Windows 2000):

TECHINDUSTRIES\

Valerie.IT

---


< Back

Next >

Cancel

New Object - User



 Create in: techindustries.local/IT

---

Password:

••••••••

Confirm password:

••••••••

☐ User must change password at next logon

☐ User cannot change password

☒ Password never expires

☐ Account is disabled

---

< Back

Next >

Cancel

New Object - User X




Create in: techindustries.local/IT

When you click Finish, the following object will be created:

Full name: Valerie VL. Leo

User logon name: Valerie.IT@techindustries.local

The password never expires.

Name	Type	Description
 SECURITY TE...	Security Group...	
 SOFTWARE ...	Security Group...	
 Valerie VL. Leo	User	

Opened command prompt to get ip address using "ipconfig": — □

```

Administrator: Command Prompt
Microsoft Windows [Version 10.0.20348.587]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Administrator>ipconfig

Windows IP Configuration

Ethernet adapter Ethernet:

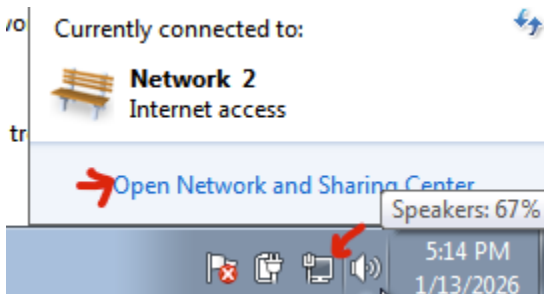
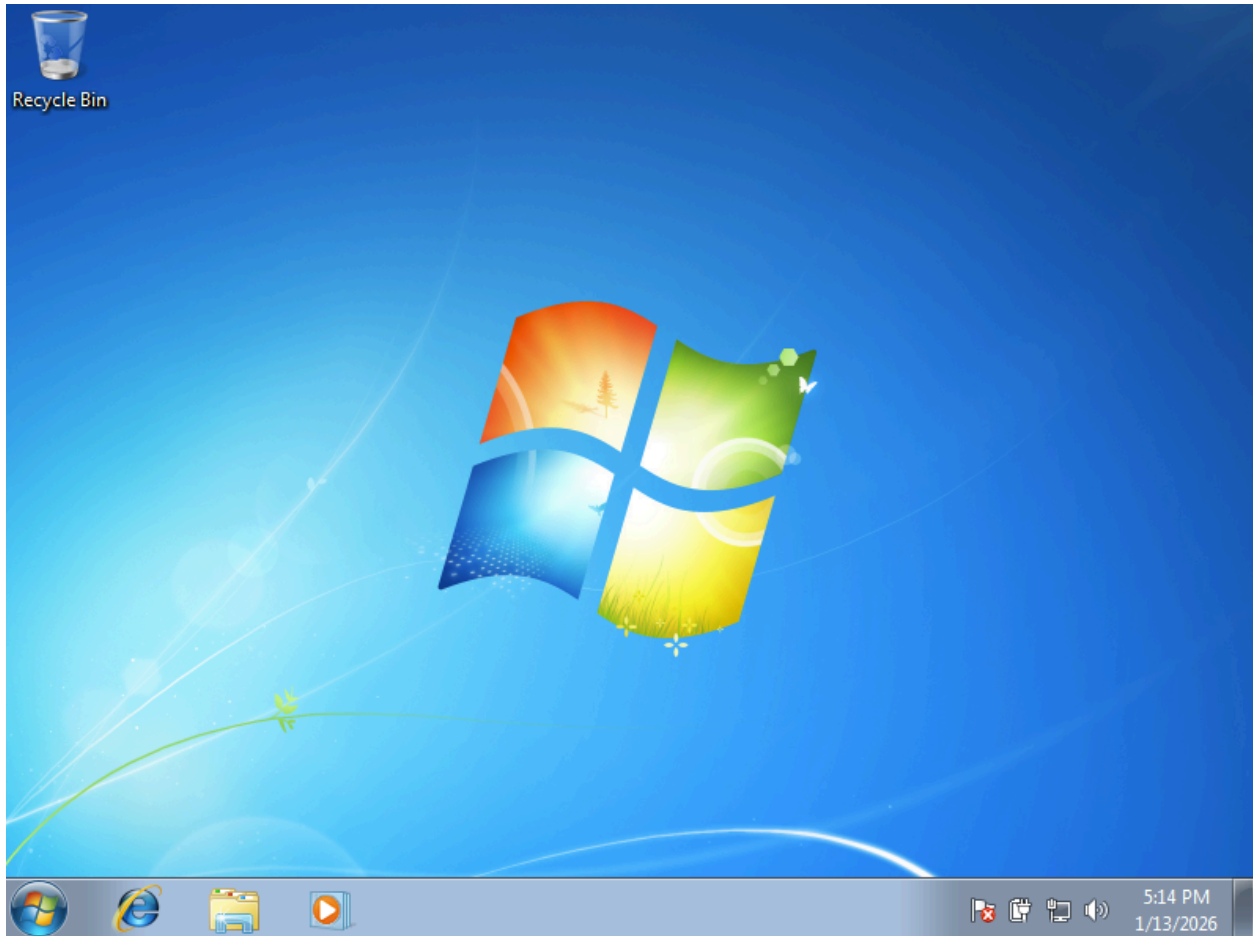
    Connection-specific DNS Suffix  . : cable.virginm.net
    Link-local IPv6 Address . . . . . : fe80::ac21:6c04:b9af:1fe9%5
    IPv4 Address. . . . . : 10.0.2.5
    Subnet Mask . . . . . : 255.255.255.224
    Default Gateway . . . . . : 10.0.2.1

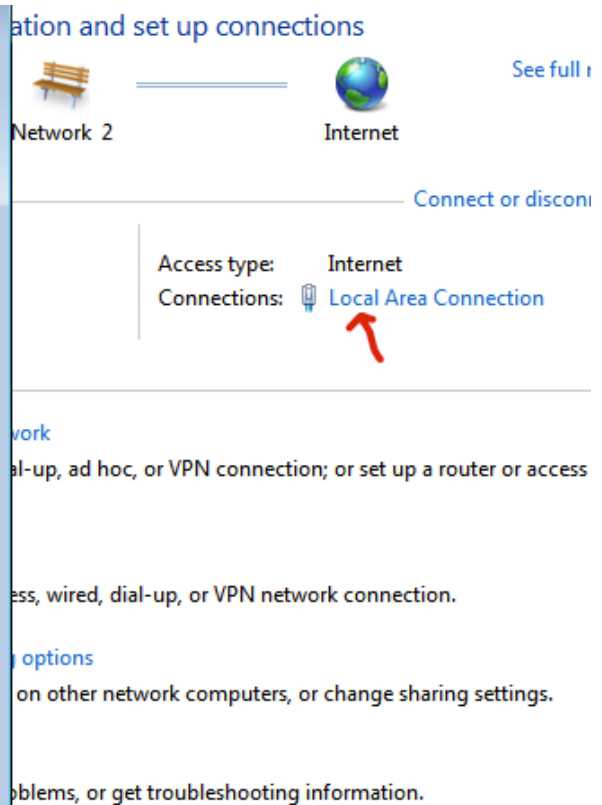
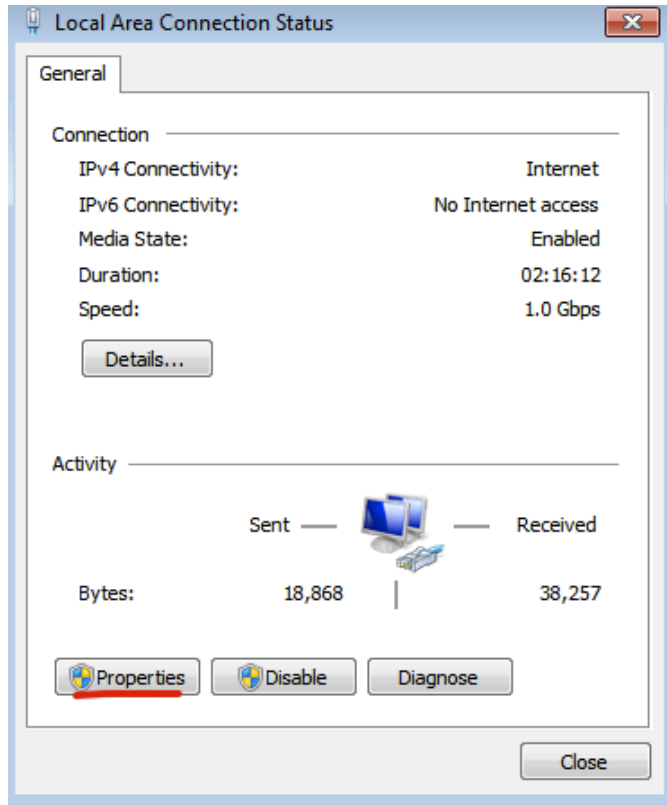
C:\Users\Administrator>

```

Navigate to Windows 7 virtual machine:

- Open Network and sharing centre (Bottom-right)
- Navigate to "Local area connection", and Click
- Navigate to "Properties"






Once navigated to properties:

- Navigate to "Internet Protocol Version 4 (TCP/IPv4)", Click
- Click on "Properties"
- Click on "Use the following IP\_address"
- Navigate to the command prompt in windows 7 and type "ipconfig"
- With the command prompt open enter in the appropriate details
- Then input the ip address of the windows server
- Then Click Okay and close all the windows









Networking

Connect using:

 Intel(R) PRO/1000 MT Desktop Adapter

[Configure...](#)

This connection uses the following items:

- ☒  Client for Microsoft Networks
- ☒  QoS Packet Scheduler
- ☒  File and Printer Sharing for Microsoft Networks
- ☒  Internet Protocol Version 6 (TCP/IPv6)
- ☒  Internet Protocol Version 4 (TCP/IPv4) 
- ☒  Link-Layer Topology Discovery Mapper I/O Driver
- ☒  Link-Layer Topology Discovery Responder

[Install...](#) [Uninstall](#) [Properties](#)

Description

Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.

[OK](#) [Cancel](#)

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

☐ Obtain an IP address automatically

☒ Use the following IP address:

IP address:

Subnet mask:

Default gateway:

☐ Obtain DNS server address automatically

☒ Use the following DNS server addresses:

Preferred DNS server:

Alternate DNS server:

☐ Validate settings upon exit

[Advanced...](#)

[OK](#) [Cancel](#)



```
C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\ vboxuser>ipconfig

Windows IP Configuration

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : cable.virginm.net
    Link-local IPv6 Address . . . . . : fe80::350f:d63:2b9f:2112%11
    IPv4 Address. . . . . : 10.0.2.4
    Subnet Mask . . . . . : 255.255.255.224
    Default Gateway . . . . . : 10.0.2.1

Tunnel adapter isatap.cable.virginm.net:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . : cable.virginm.net
```

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

☐ Obtain an IP address automatically

☒ Use the following IP address:

IP address:

Subnet mask:

Default gateway:

☐ Obtain DNS server address automatically

☒ Use the following DNS server addresses:

Preferred DNS server:

Alternate DNS server:

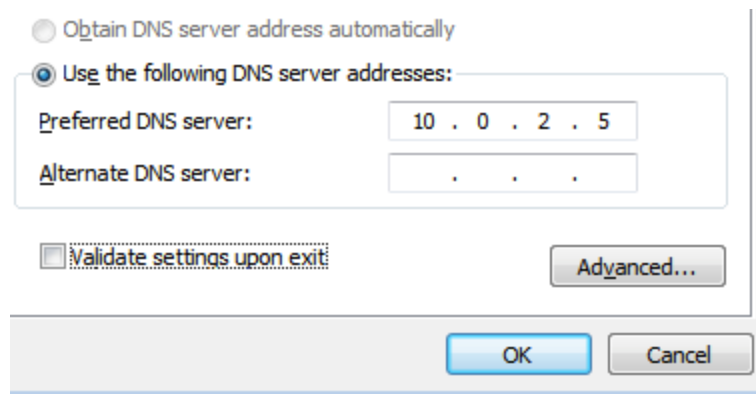
☐ Validate settings upon exit

Advanced...

OK Cancel

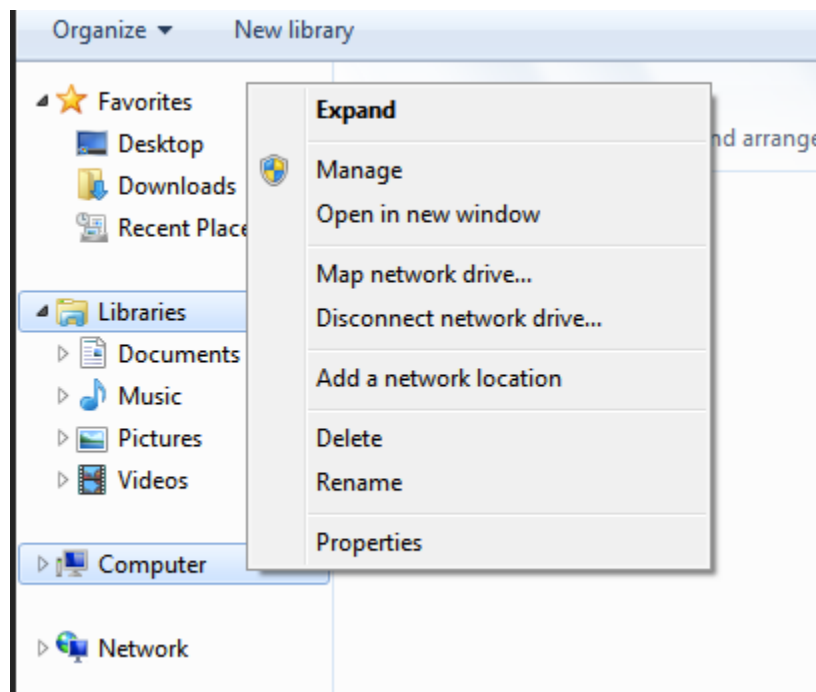
```
Connection-specific DNS Suffix  . : cable.virginm.net
Link-local IPv6 Address . . . . . : fe80::ac21:6c04:b9af:1fe9%5
IPv4 Address. . . . . : 10.0.2.5
Subnet Mask . . . . . : 255.255.255.224
Default Gateway . . . . . : 10.0.2.1
```

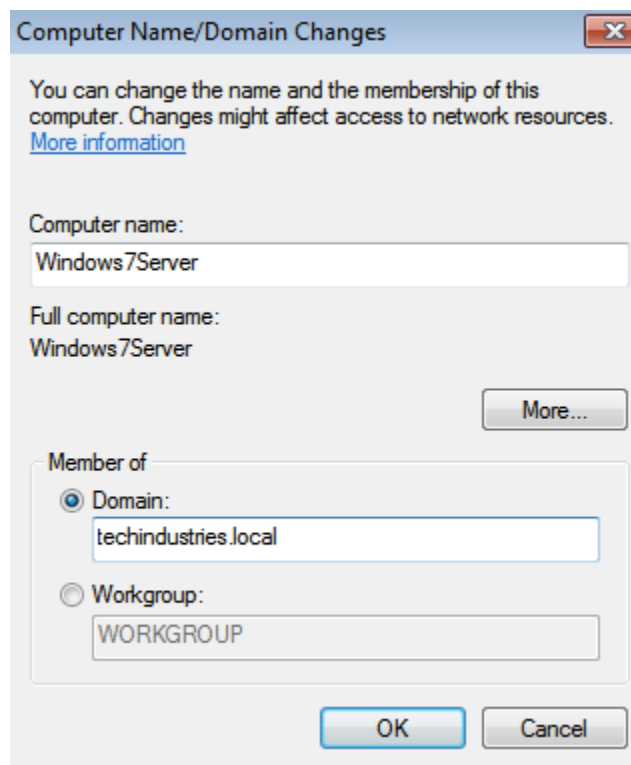
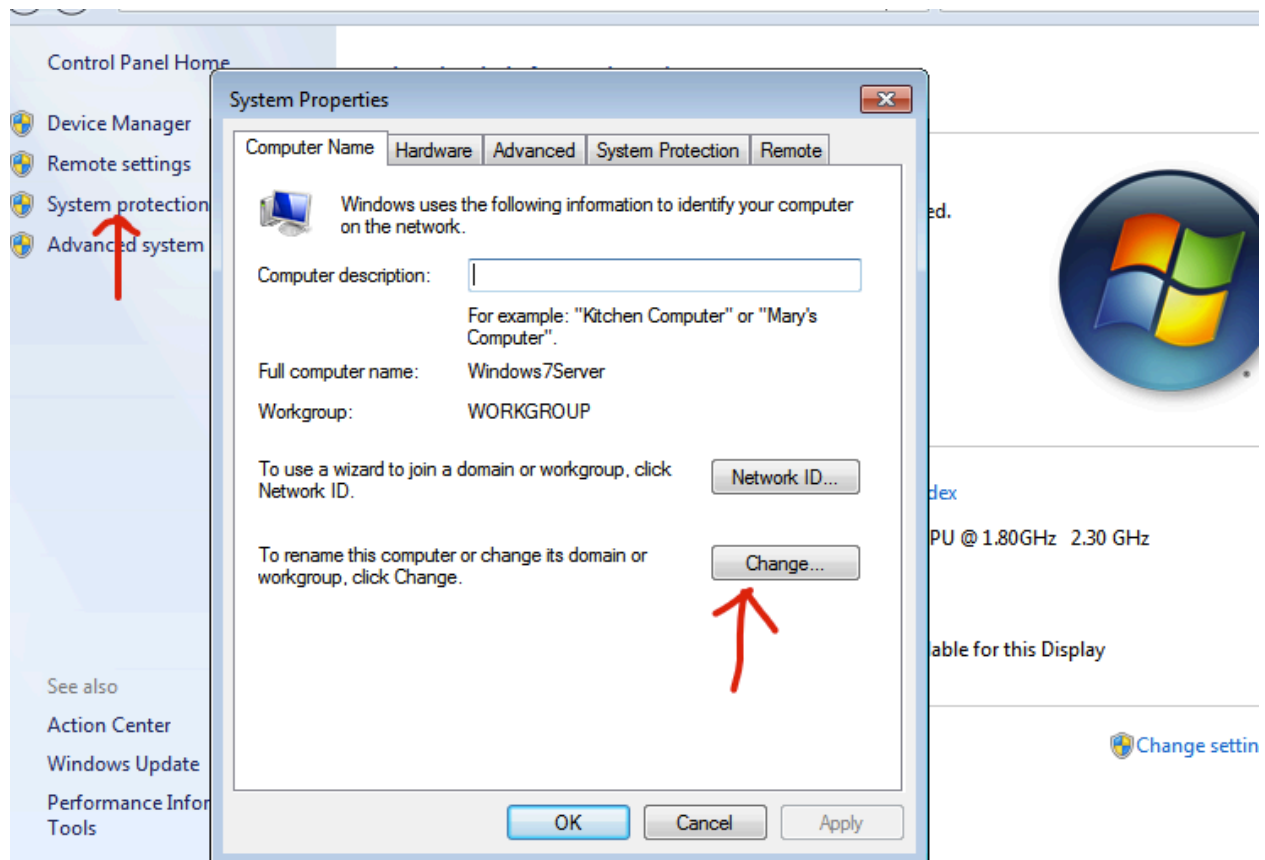
(IP address of the server)



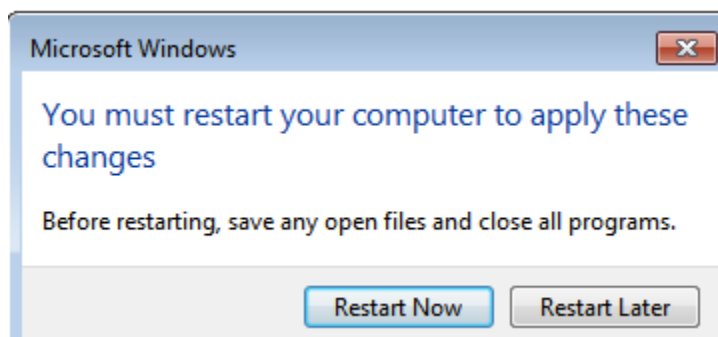
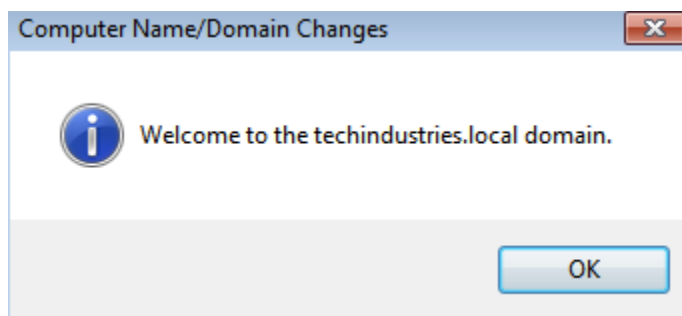
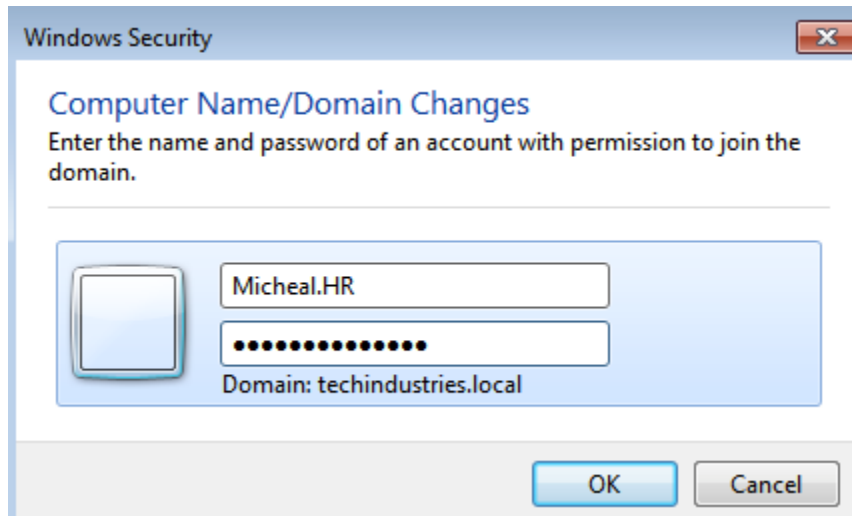
### Configuring Windows 7:

- Navigate to file explorer
- Right click on Computer
- Click on "Properties"
- Click on System Protection
- Click on Change
- Click on Domain and name it your domain name that you have used on the windows server



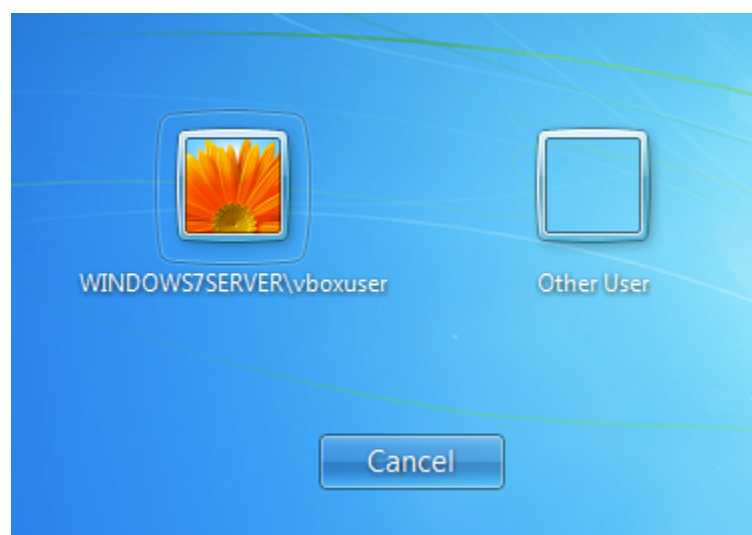


Input the correct name with same password as the windows server  
After clicking okay, it will prompt you to restart.



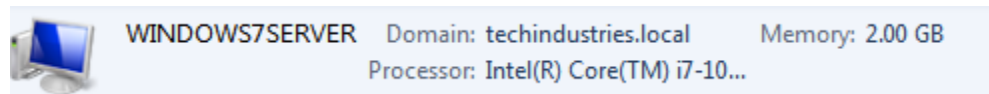
After restarting:

- Switch User
- Click Other User
- Enter Login Details

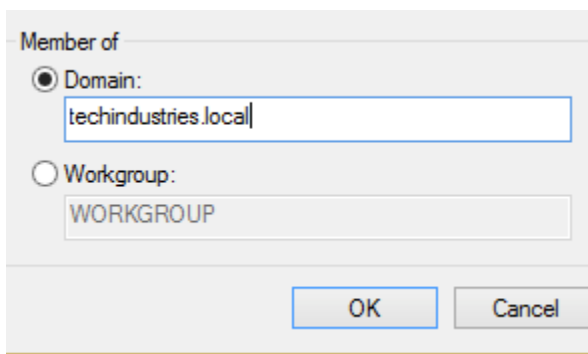
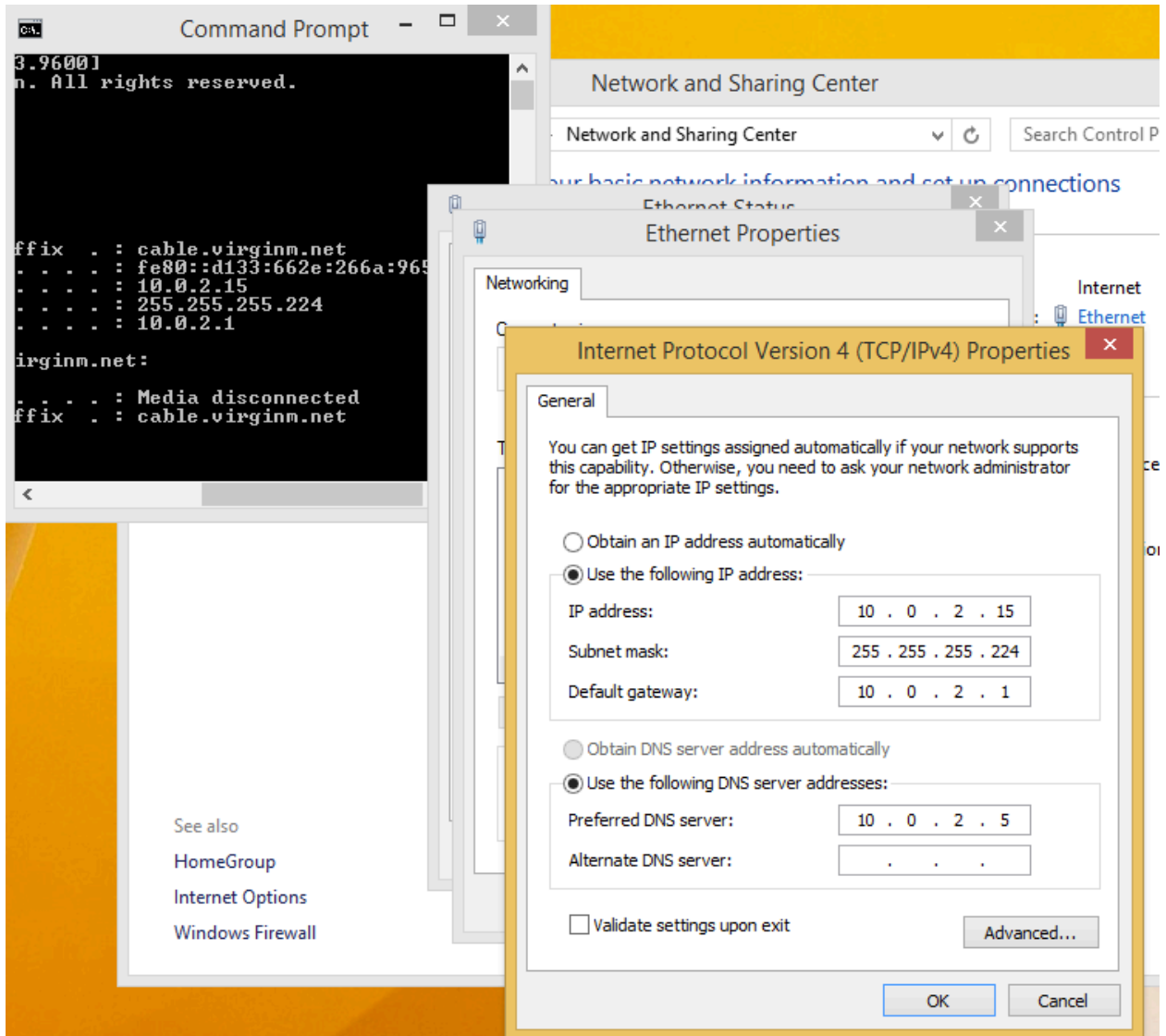


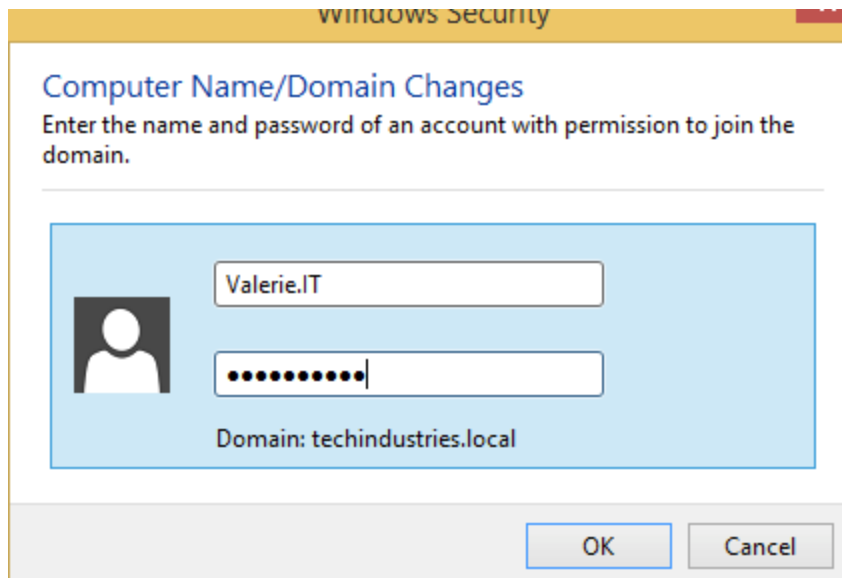


Logged in as "Micheal.HR"  
Domain: technicalindustries.local



Configuring Windows 8 will be the same process as windows 7:





Logged in as "Valerie.IT" on Windows 8 VM.



## **Group Policy Objects**

A Group Policy Object (GPO) is a collection of configuration settings in Active Directory that allows administrators to centrally manage and enforce security and system behaviour for users and computers within a domain.

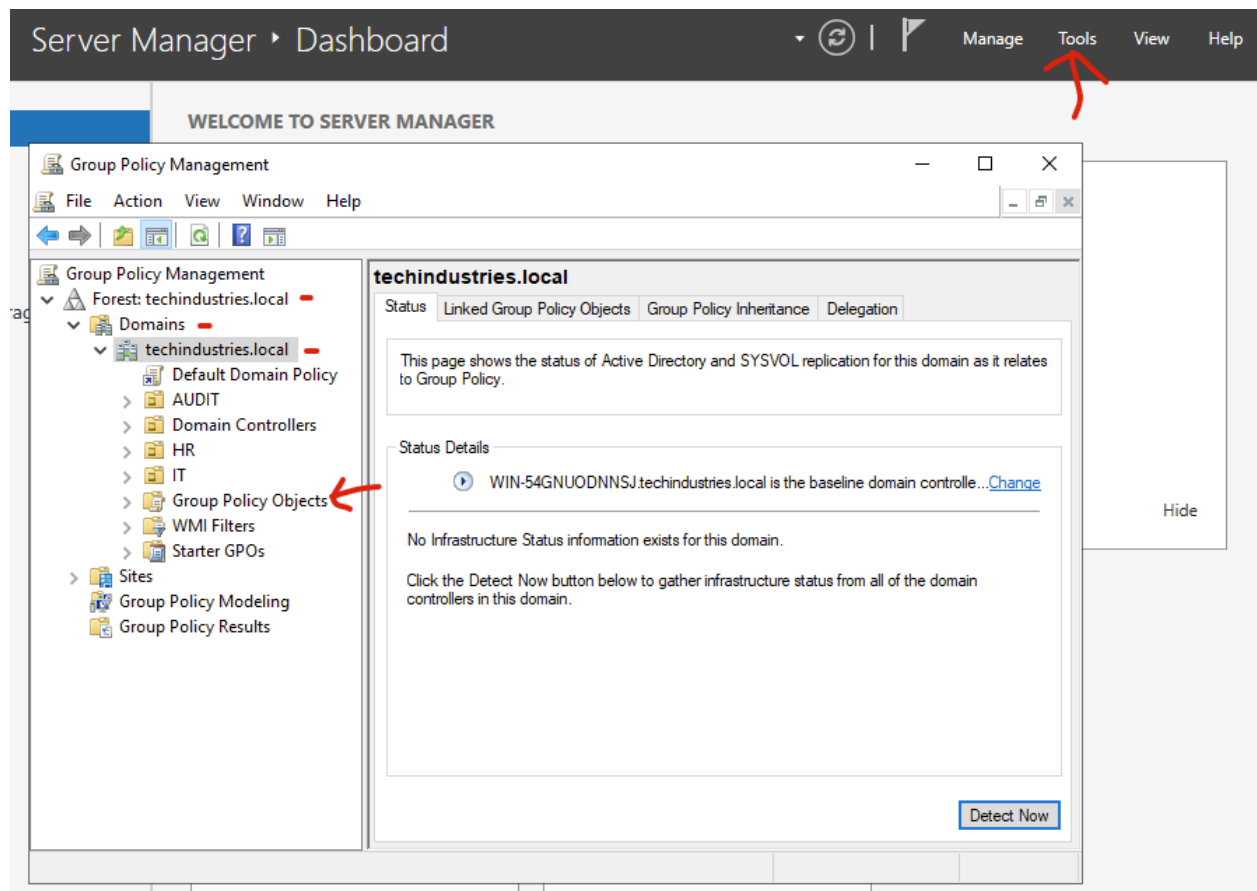
### **Why do GPOs matter in an AD?**

Reasons as to why GPO matters:

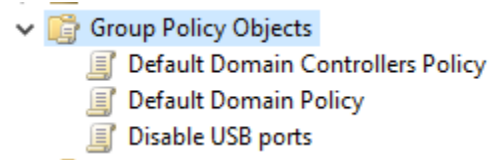
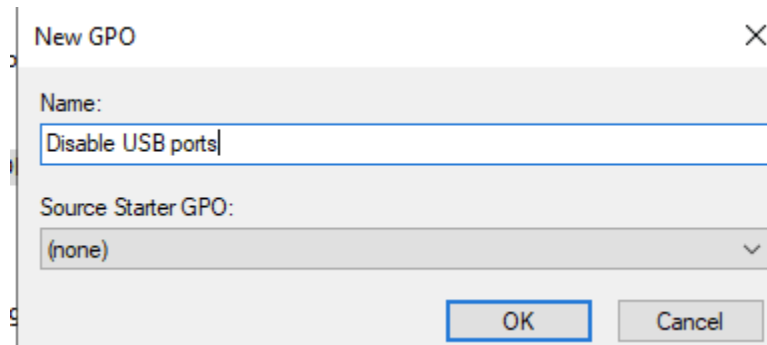
- One of the most powerful features of Active Directory
- Essential for security, consistency, and control
- Used in real enterprise environments

In the windows server:

- Navigate to the tools bar (top-right)
- Click Group Policy Management
- Click on the drop down "Forest:{your-domain-name}"
- Navigate to "Group Policy Objects"
- Right Click on it to create a new Group Policy



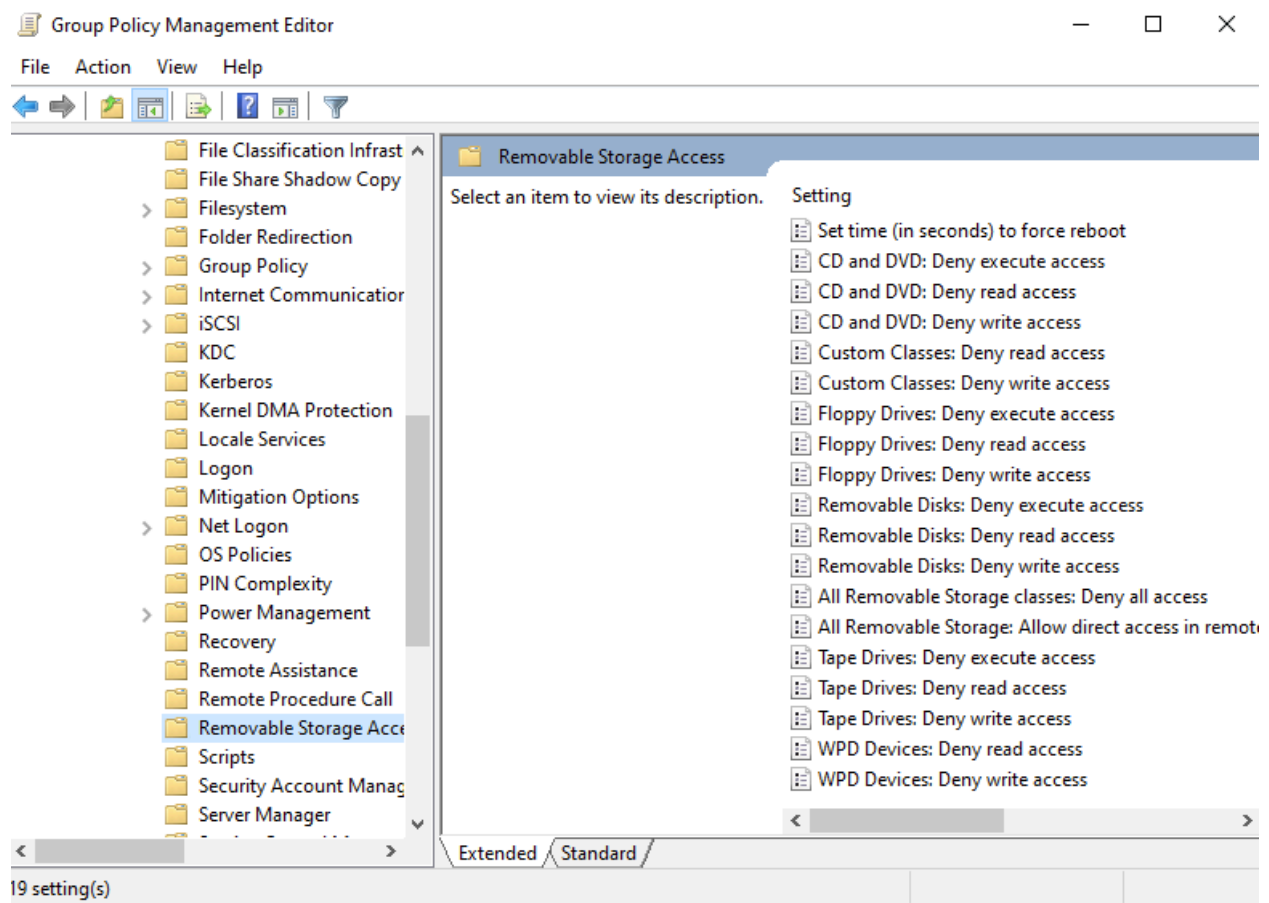
Policy created "Disable USB ports":



Right Click the policy created:

- Click the drop down "Policies" then "Administrative: Templates Policy" then "System"
- Navigate till u find "Removable Storage Access"
- In this find "All removable Storage classes: Deny all access"

- Set it to Enabled
- Then bottom right click apply and then okay



All Removable Storage classes: Deny all access

All Removable Storage classes: Deny all access

Previous Setting Next Setting

☐ Not Configured    Comment:

☒ Enabled

☐ Disabled

Supported on: At least Windows Vista

Options:

Help:

Configure access to all removable storage classes.

This policy setting takes precedence over any individual removable storage policy settings. To manage individual classes, use the policy settings available for each class.

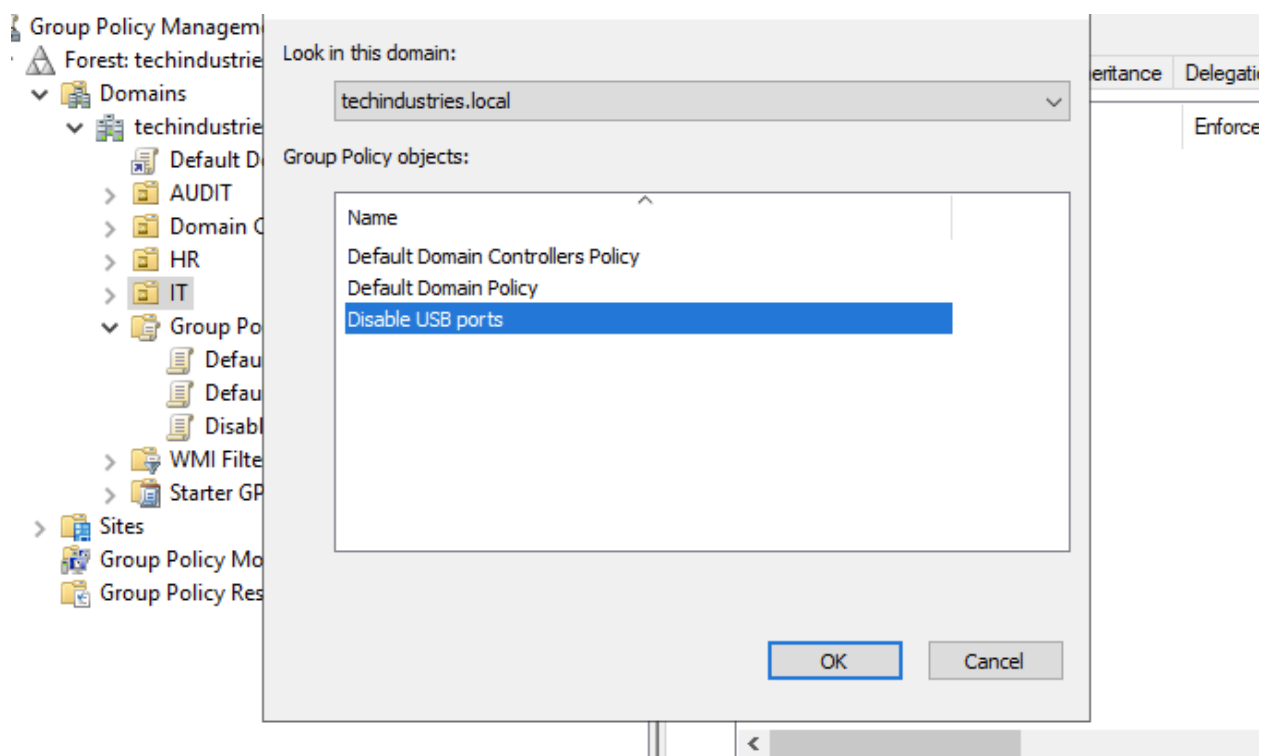
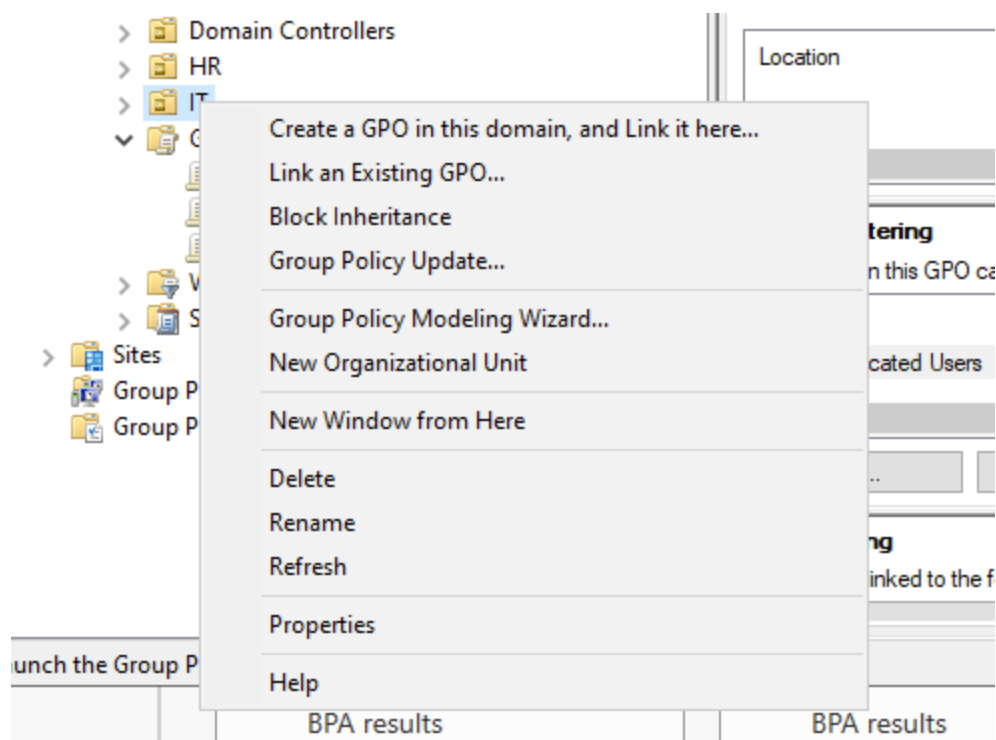
If you enable this policy setting, no access is allowed to any removable storage class.

If you disable or do not configure this policy setting, write and read accesses are allowed to all removable storage classes.

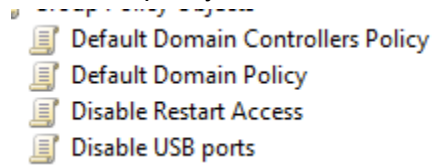
OK Cancel Apply

Now to Link this GPO to an OU:

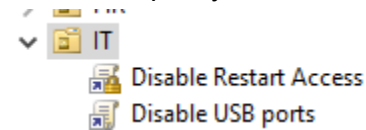
- Right Click on IT OU
- Navigate to "Link an Existing GPO"
- Find policy you created and click on it - press okay



Created a policy called "Disable restart access":



Linked the policy to the IT OU:



Updating policy for virtual machine:

*Repeat this process on the server and virtual machine*

```
C:\Users\Administrator>gpupdate /force
Updating policy...

Computer Policy update has completed successfully.
User Policy update has completed successfully.
```

Policy "Disable restart access", works successfully

