Operating Systems & Architecture

VIRTUAL WINDOWS ACTIVE DIRECTORY / NETWORK SERVER VIRTUALIZATION

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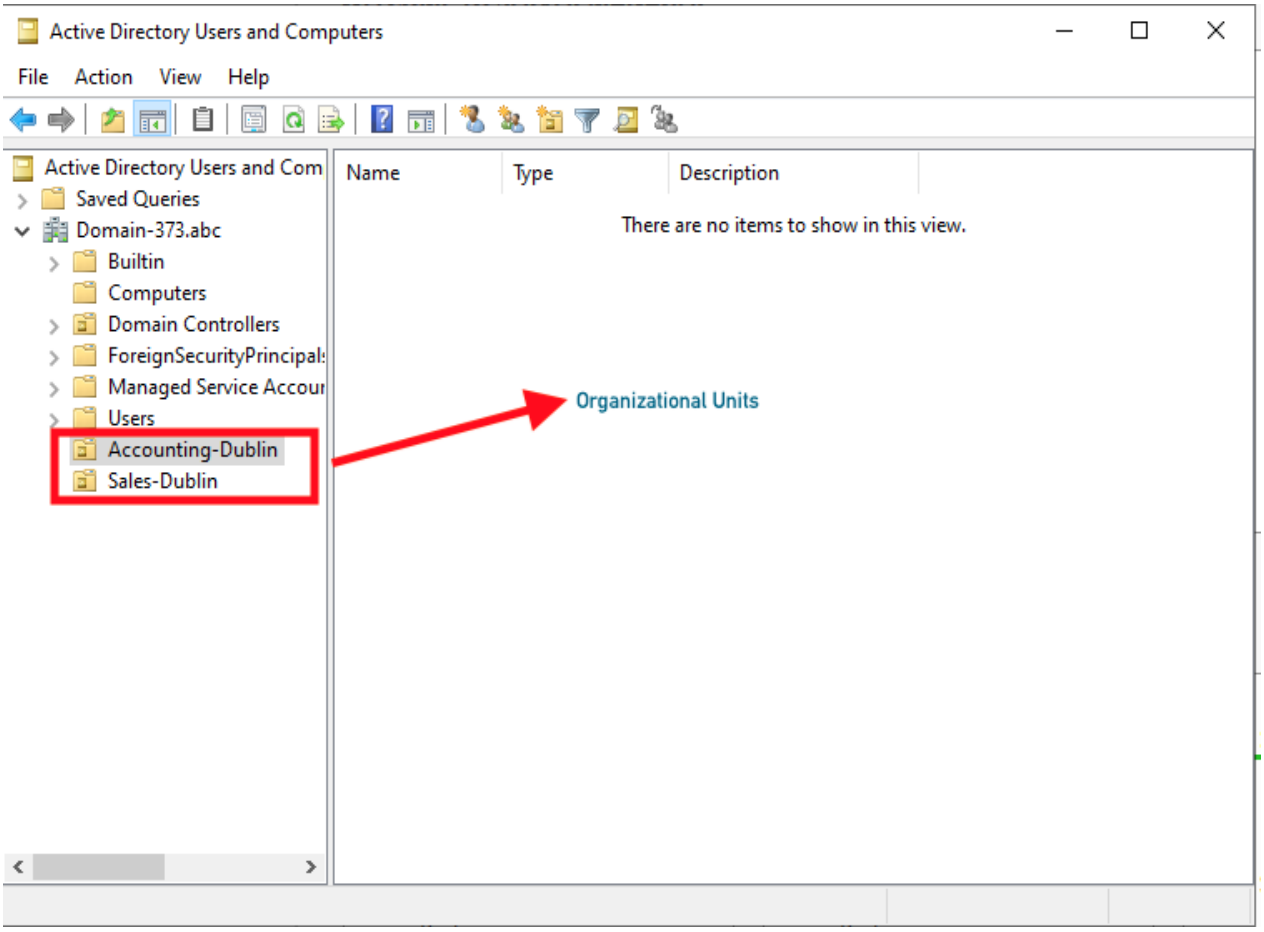
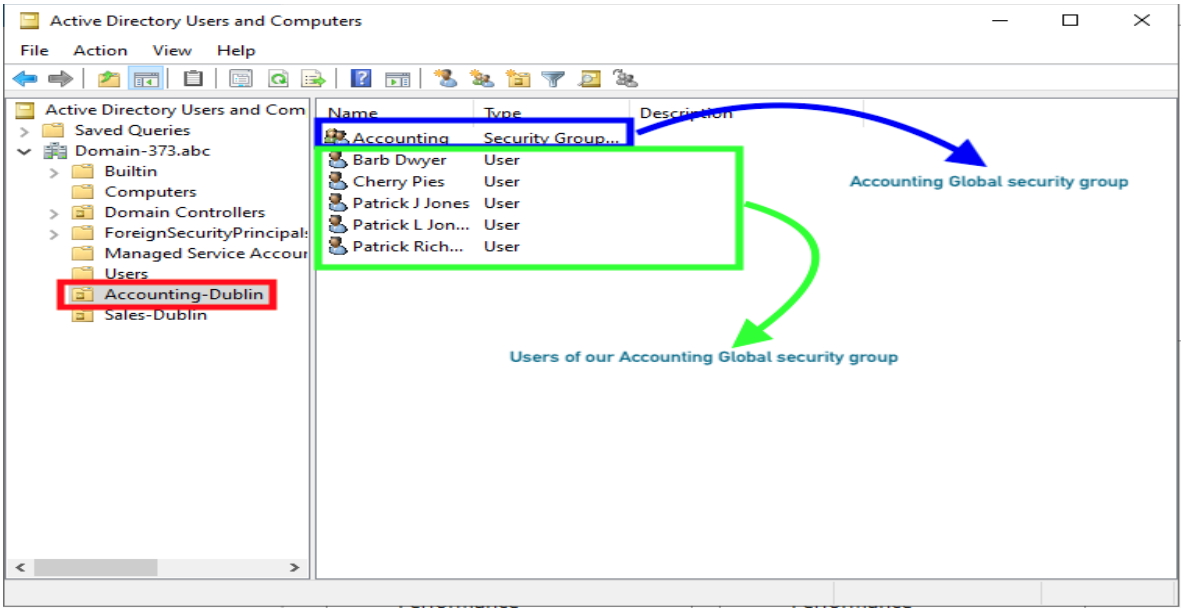
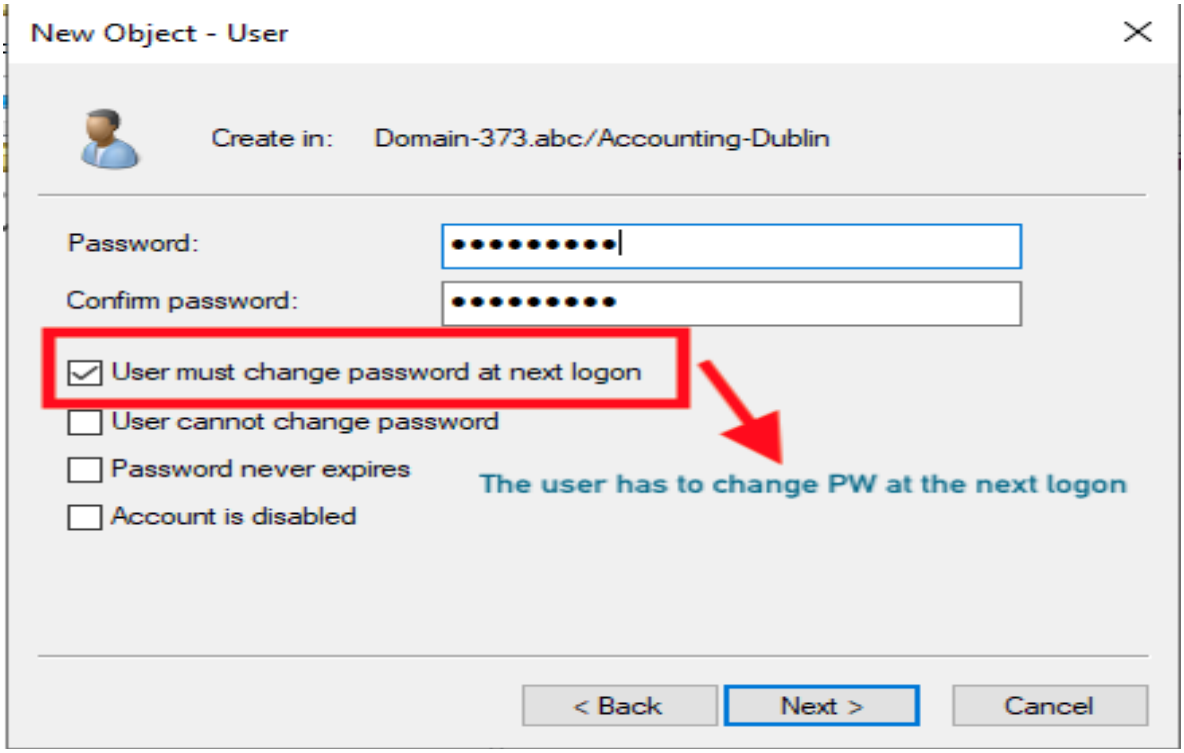
1.) Setting up the resources and network users.

a.) DigiTech has two departments. Using Active Directory Users and Computers (ADUC), create 2 departments (Organizational Units) called Accounting-Dublin and Sales-Dublin

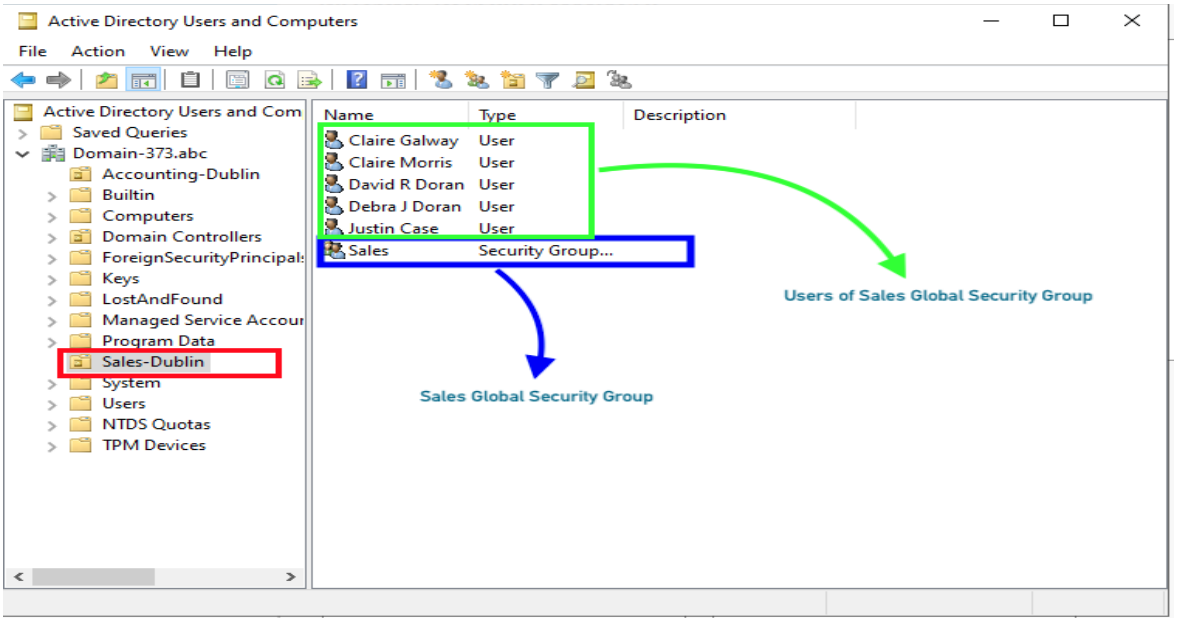


b.) Inside the Accounting-Dublin OU create a Global Security group called Accounting and then create the 5 Accounting users accounts shown below, using the names supplied.

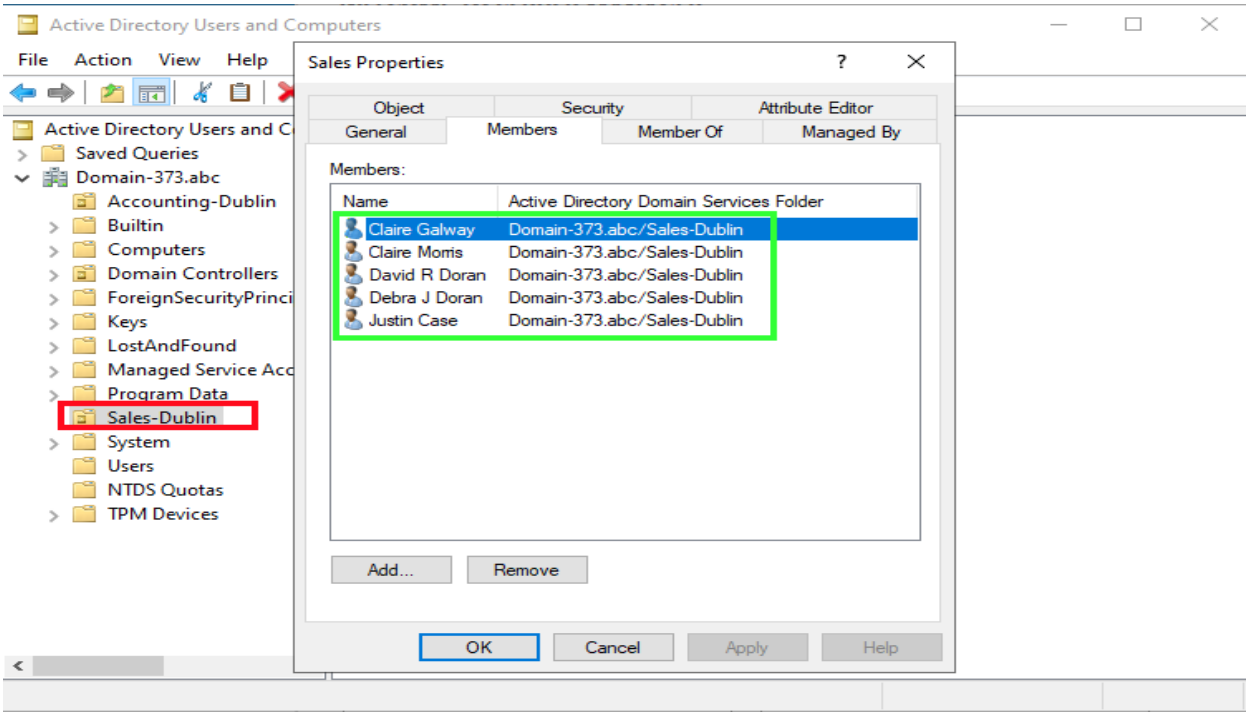


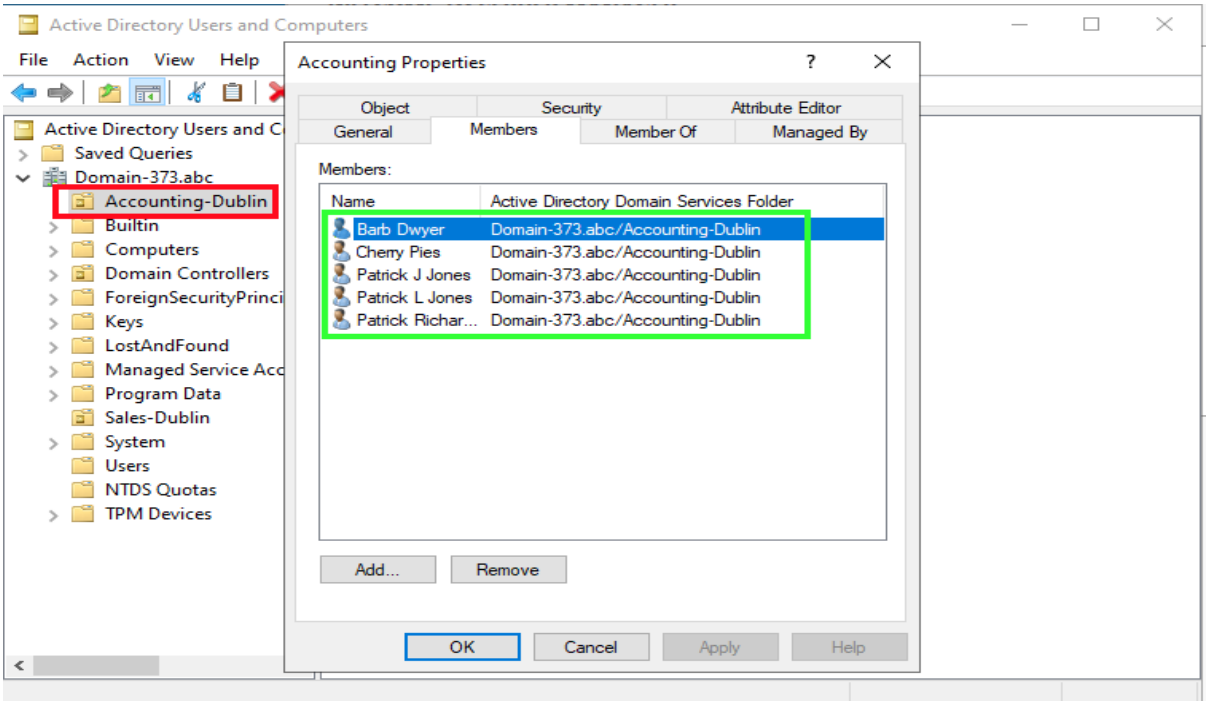


a) Inside the Sales-Dublin OU create a Global Security group called Sales and then create the 5 Sales users accounts shown below, using the names supplied.



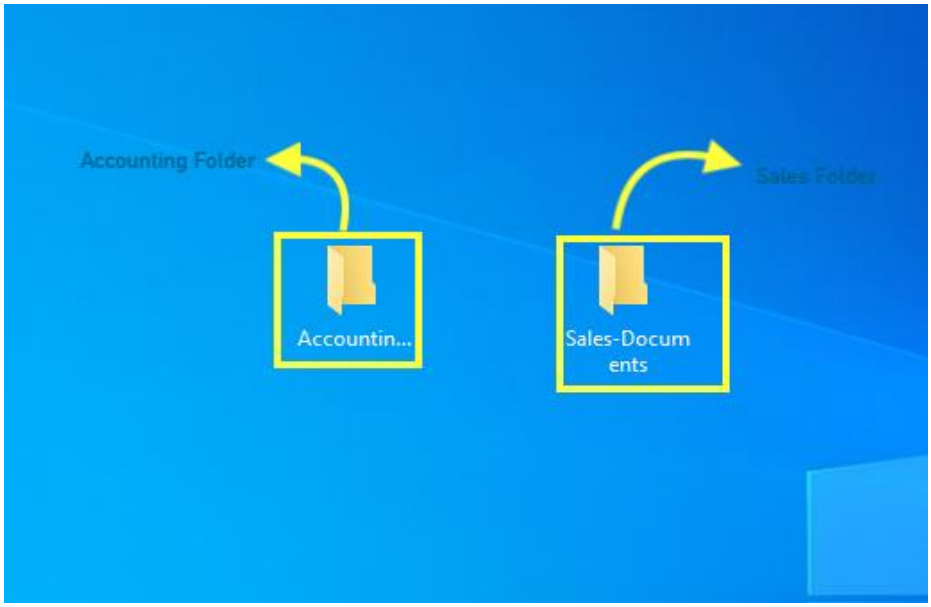
b) Use ADUC to add each of the 10 users to their groups (Accounting and Sales).





c.) Inside each departmental OU (Accounting-Dublin and Sales-Dublin), create and share two folders (one for each department) and apply permissions as specified below:

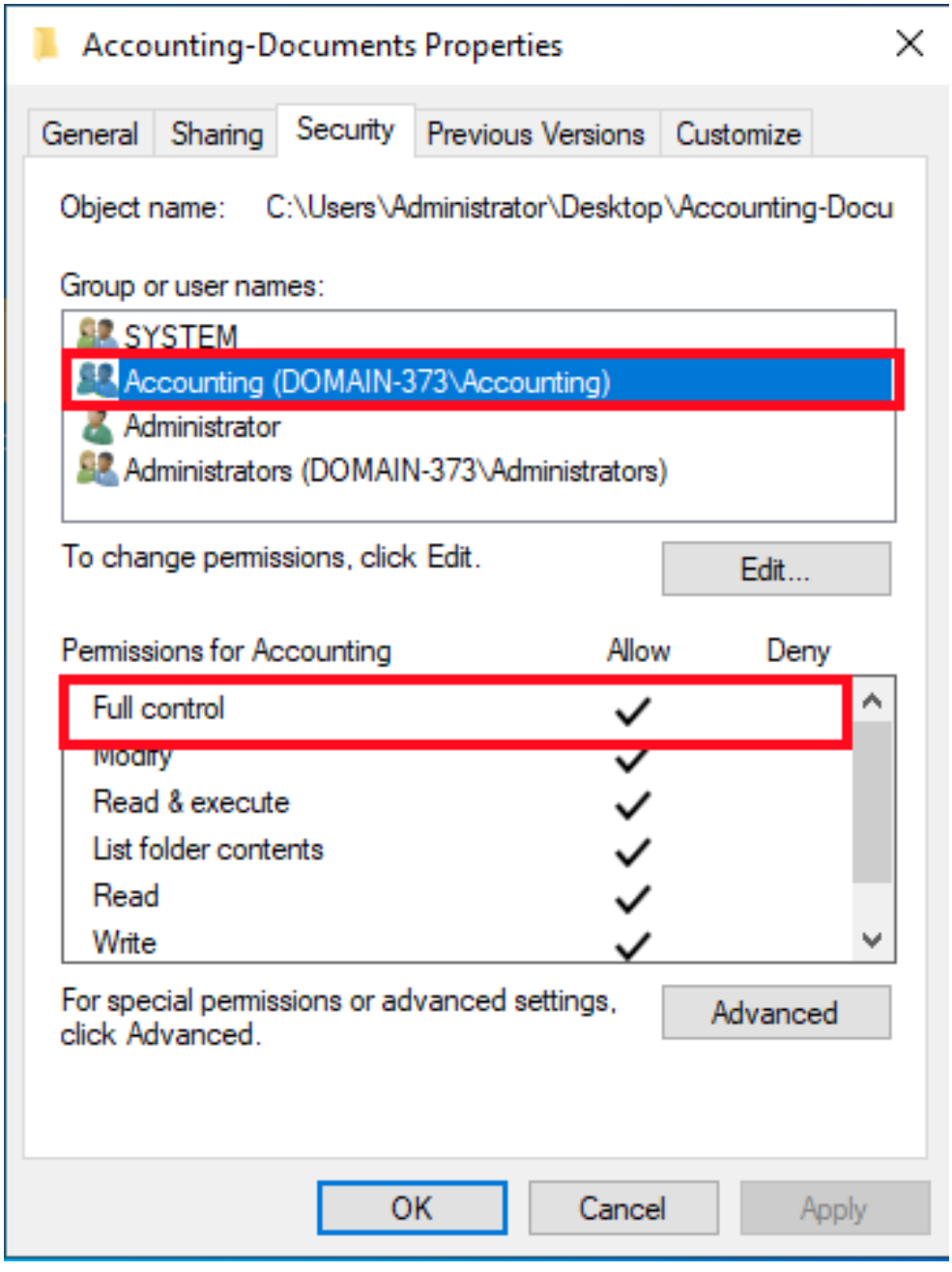
Create one folder for each department (Sales-Documents for the sales department and Accounting-Documents for the accounting department).



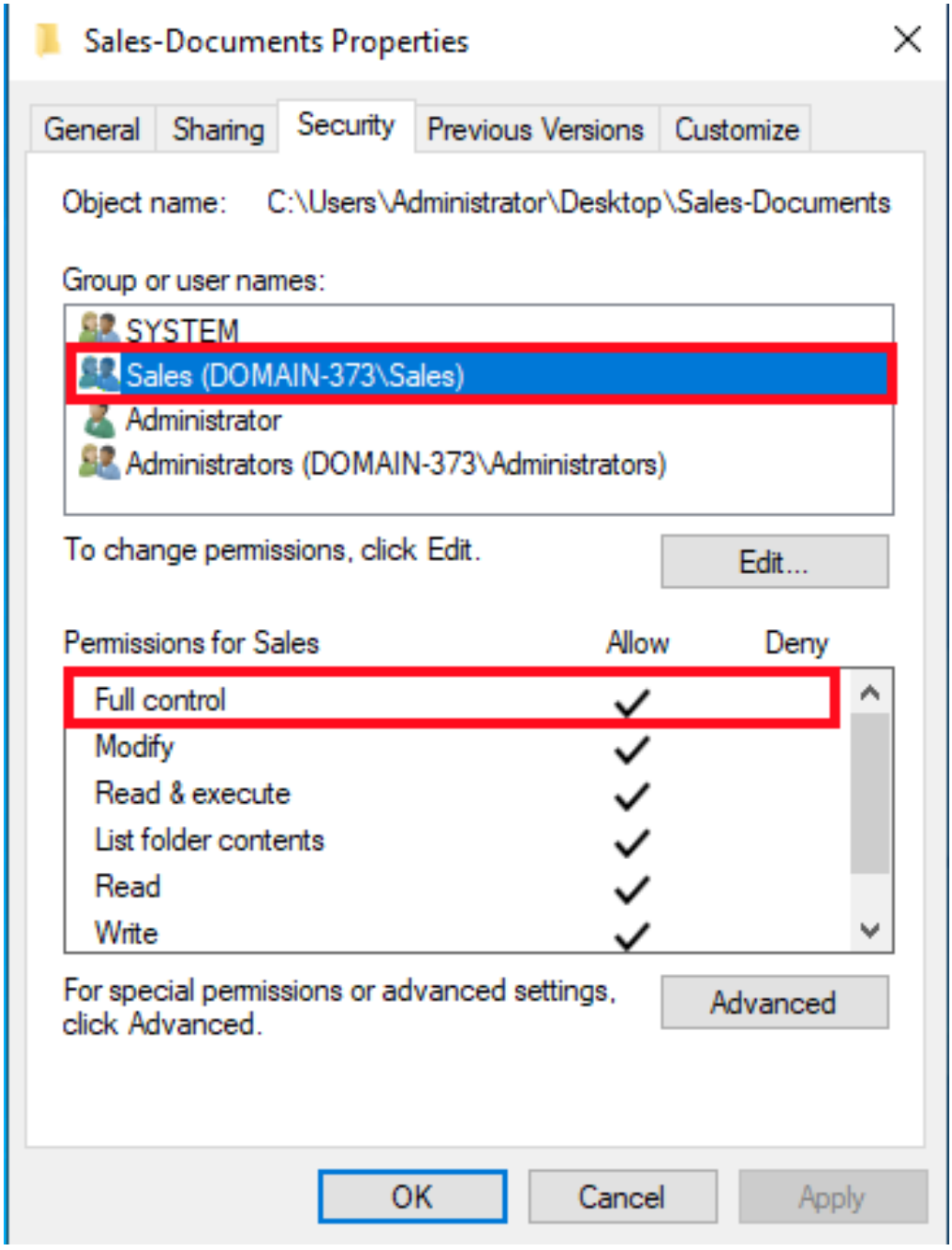
Share each of the folders applying permissions as follows:

You will apply both Share permissions and NTFS permissions.

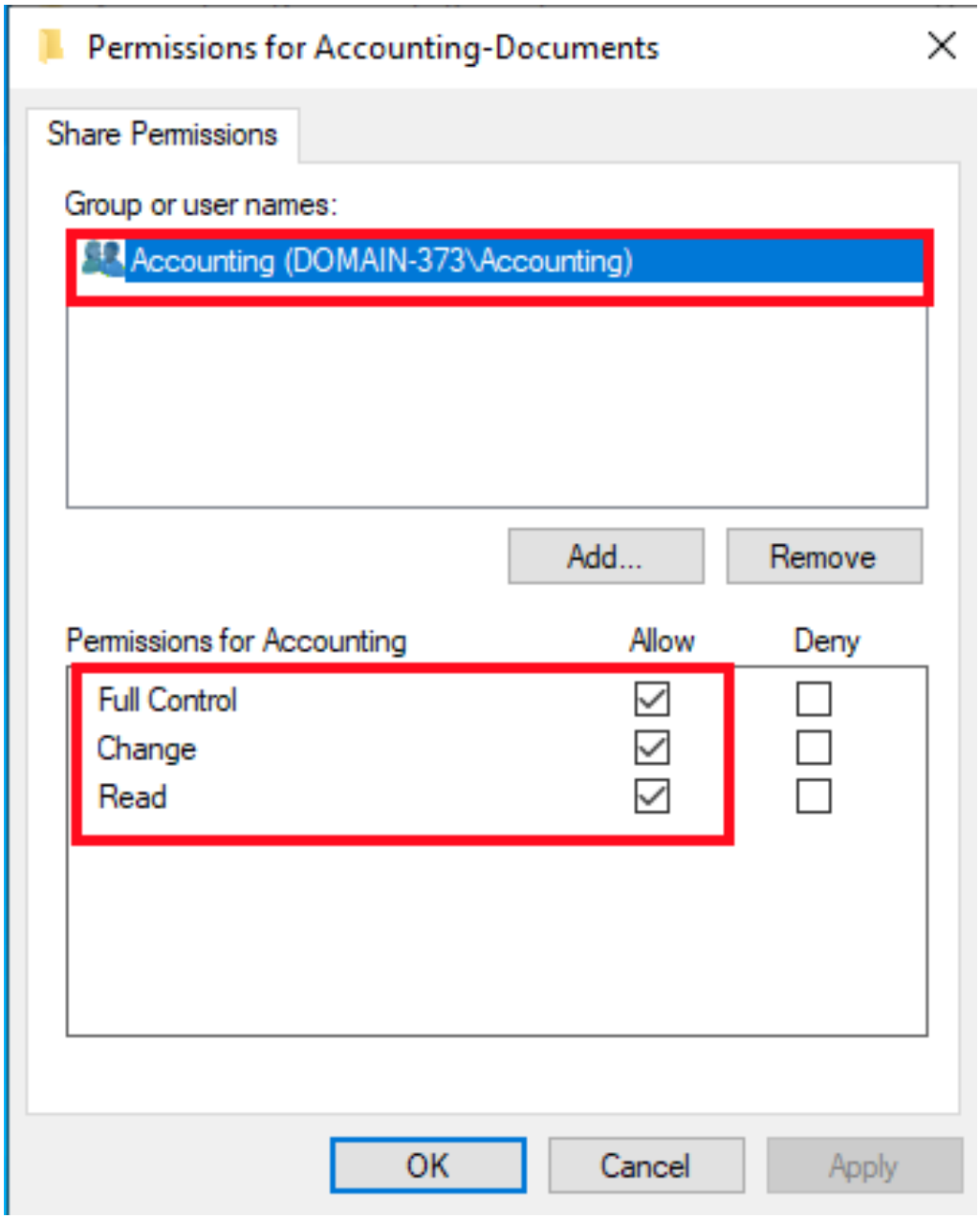
Give the Accounting group Full Control permissions for the Accounting-Documents folder.

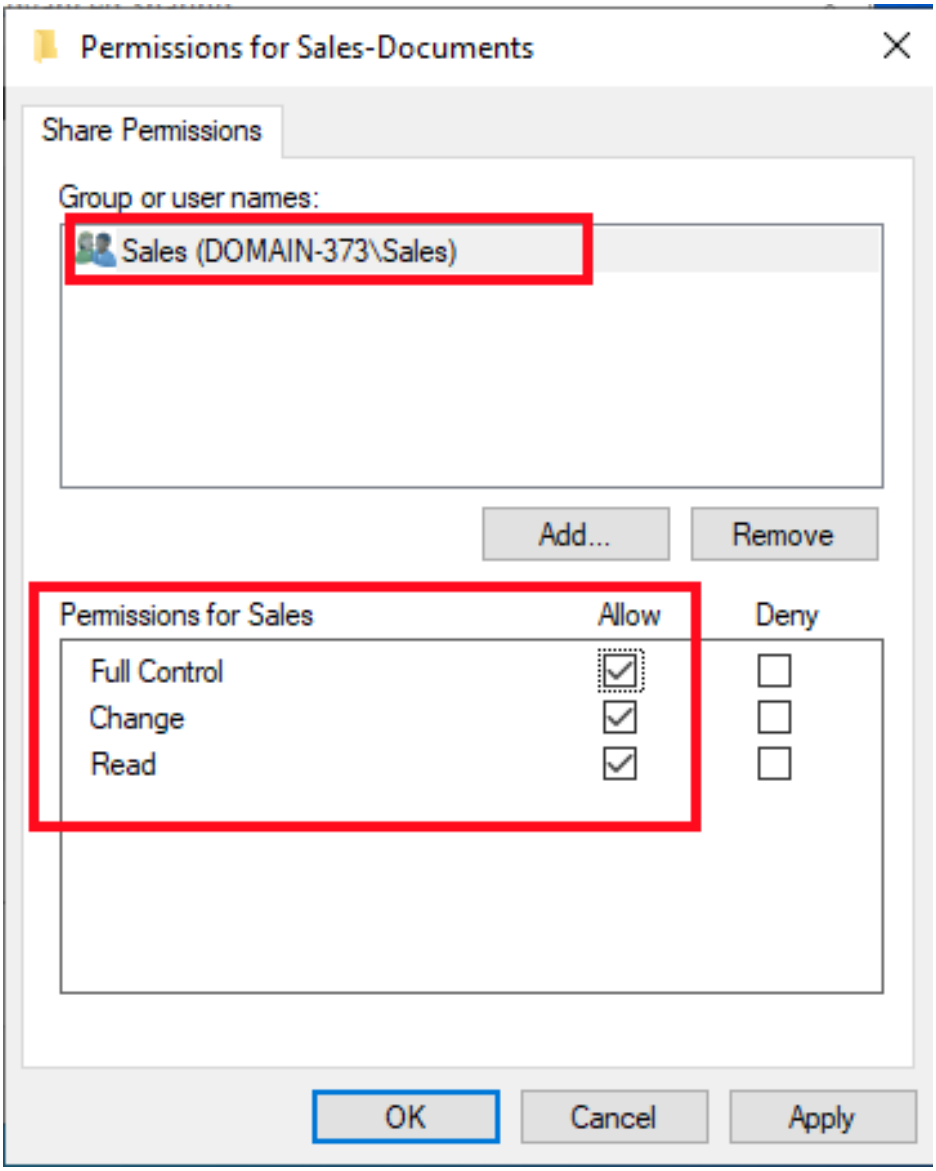


The Sales group should have Full Control permissions for the Sales-Documents folder.



You should remove the Everyone group when applying the share permissions. Note: you will need to set the permissions on both the Share and Security tabs.




Permissions for Sales-Documents
Share Permissions
Group or user names:
Sales (DOMAIN-373\Sales)
Add...
Remove
Permissions for Sales
Allow
Deny
Full Control
Change
Read
OK
Cancel
Apply

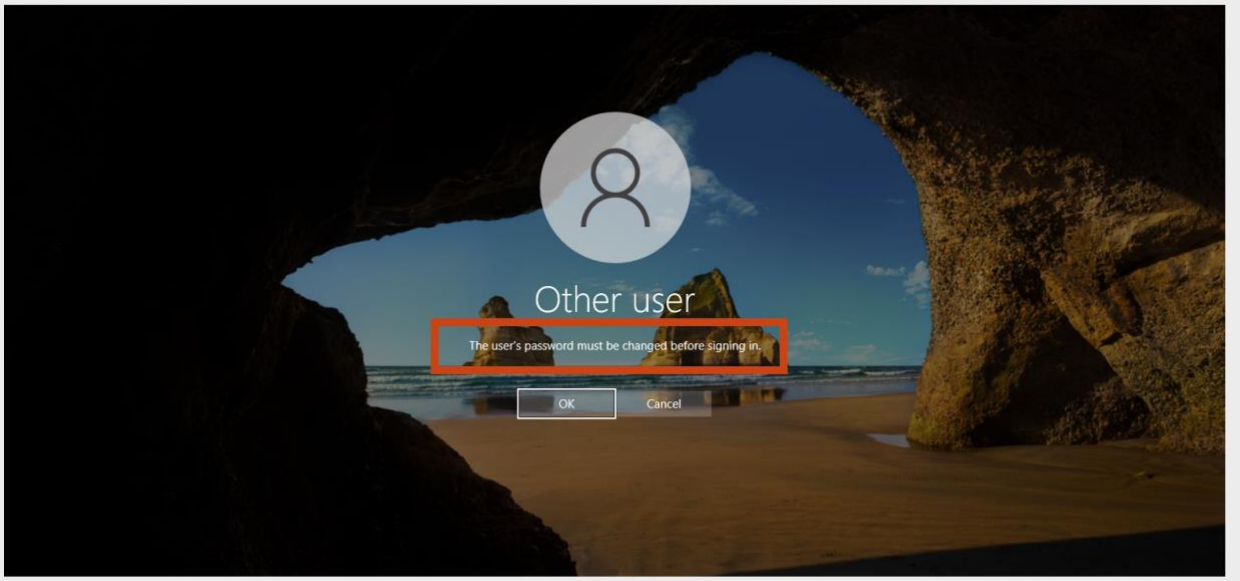
d.) Test the permissions for both the Sales-Documents folder and the Accounting-Documents folder by logging onto the Web computer by using a user account from Dublin-Sales or a user account from Dublin-Accounting.

Use UNC format to check the permissions for both resources: \\Server-name\Share-name If the permissions do not work, go back to the Domain Controller, and troubleshoot!

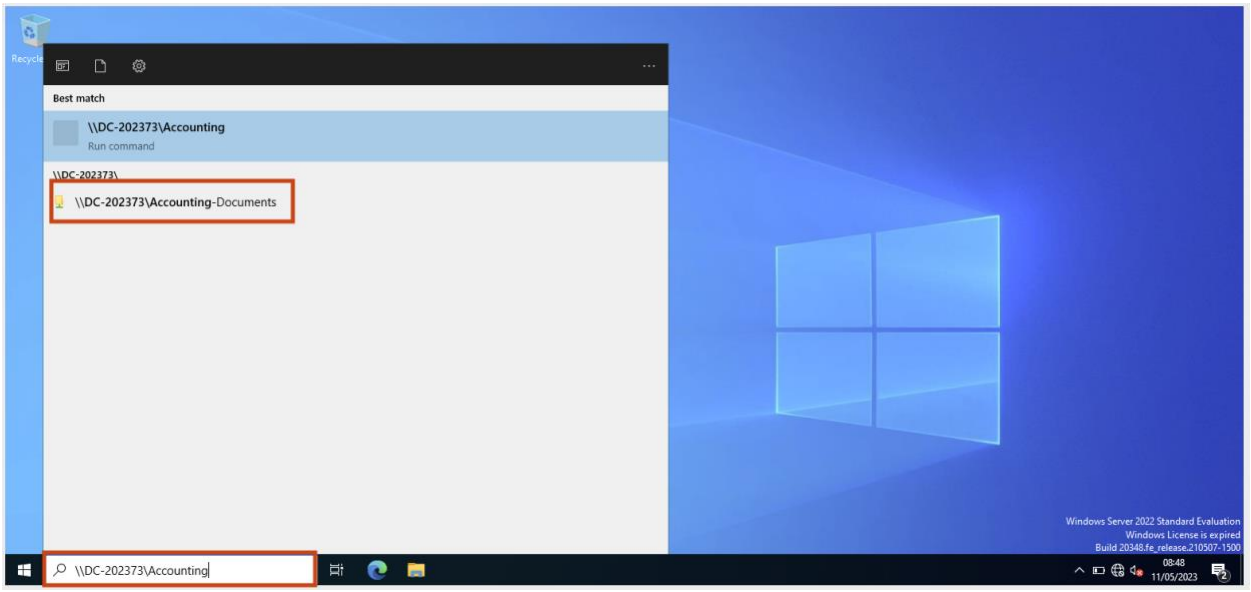
Testing the resources permissions: You should be able to demonstrate that the permissions are working for both the Sales and the Account folders. For example, if you log onto the Web server as a member of the Sales group, you should be able to access the Sales-Documents folder but have Access Denied on the Accounting folder.

----------ACCOUNTING-TEST----------

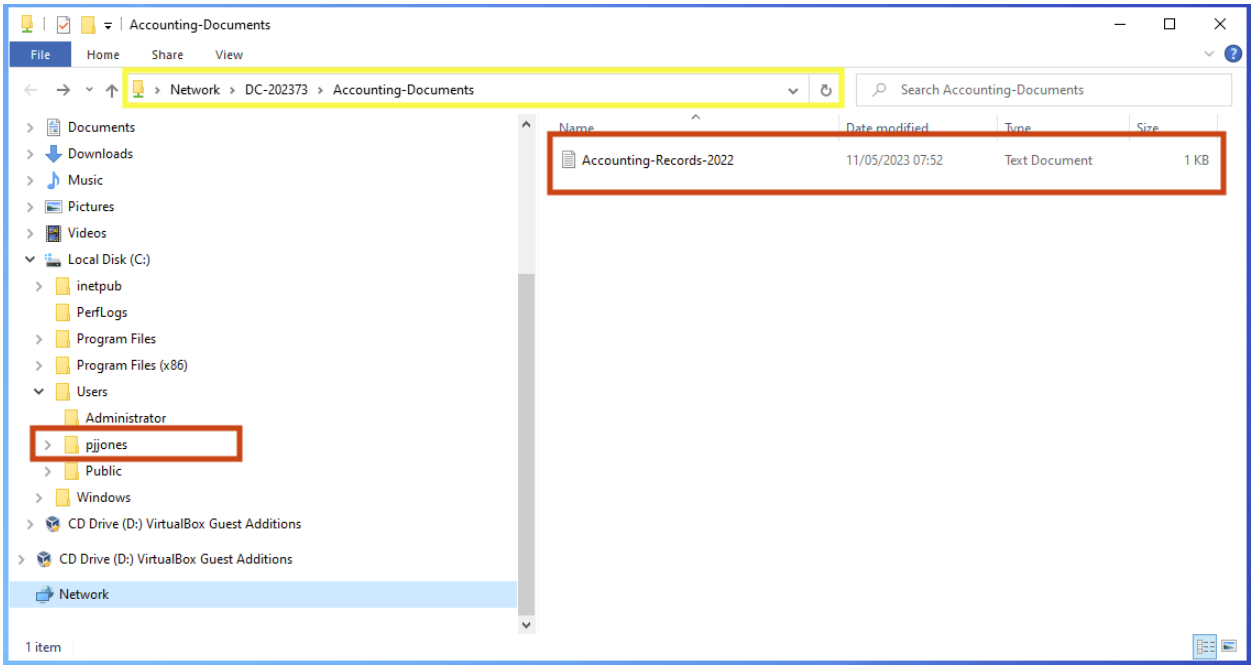
If asked to change the password during the first log-in, use pass1234$ for the password as we have been using.



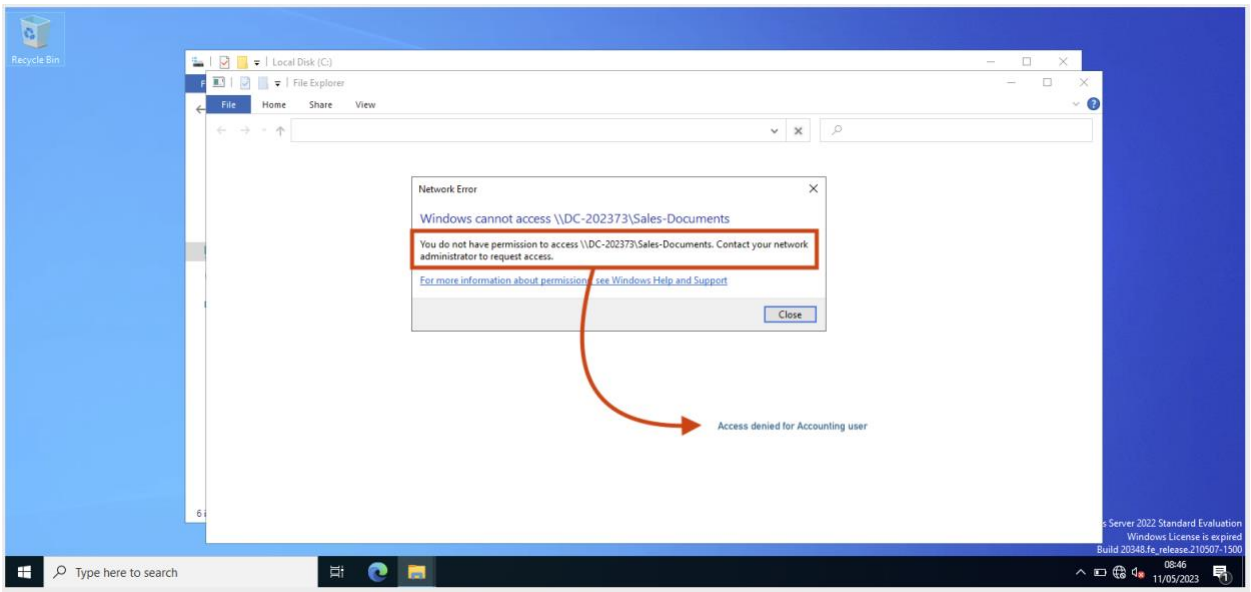
Use UNC format to check the permissions for both resources: \\Server-name\Share-name



Accounting-Dublin user should be able to access Accounting-Documents.

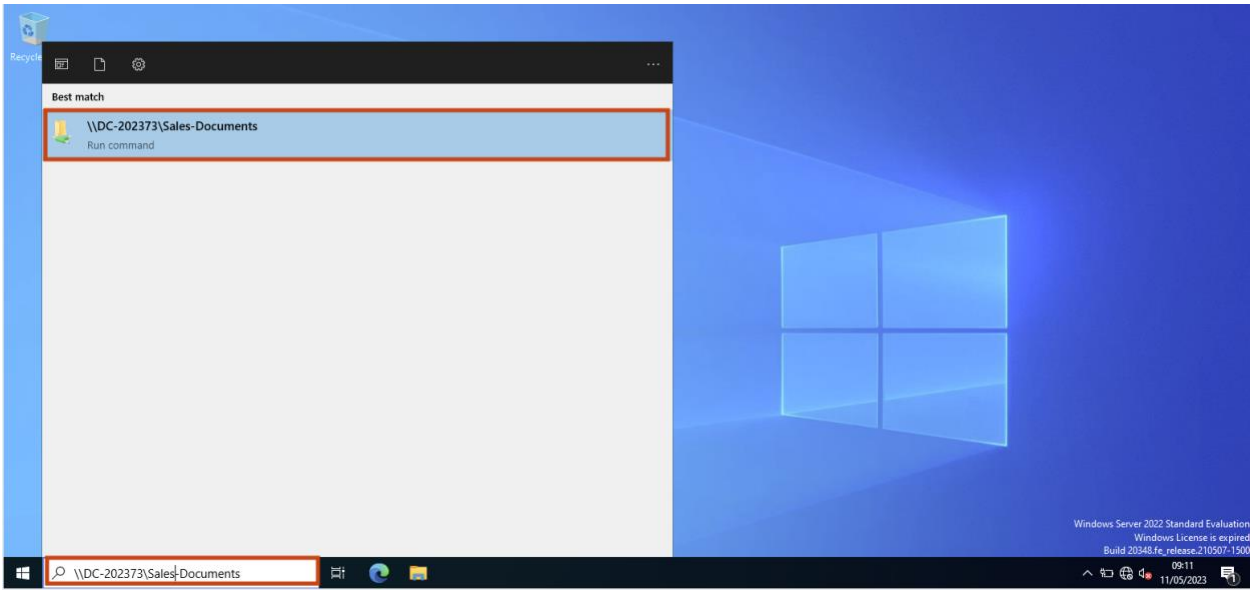


But not Sales-Documents.

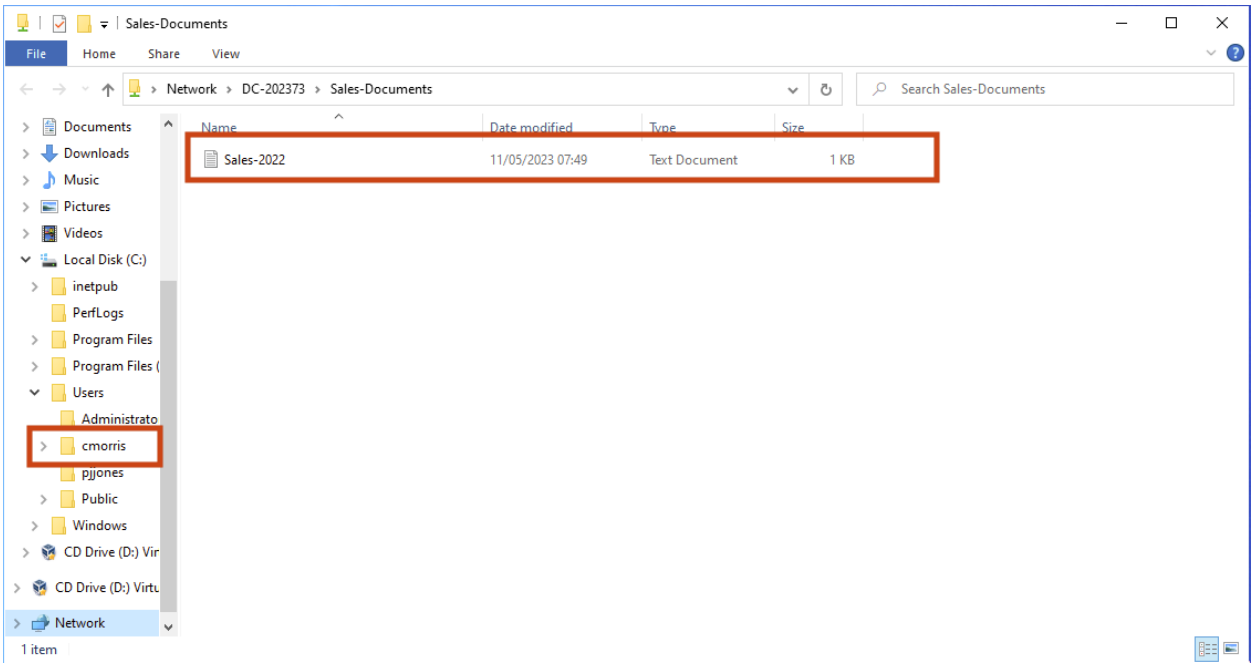


----------SALES-TEST----------

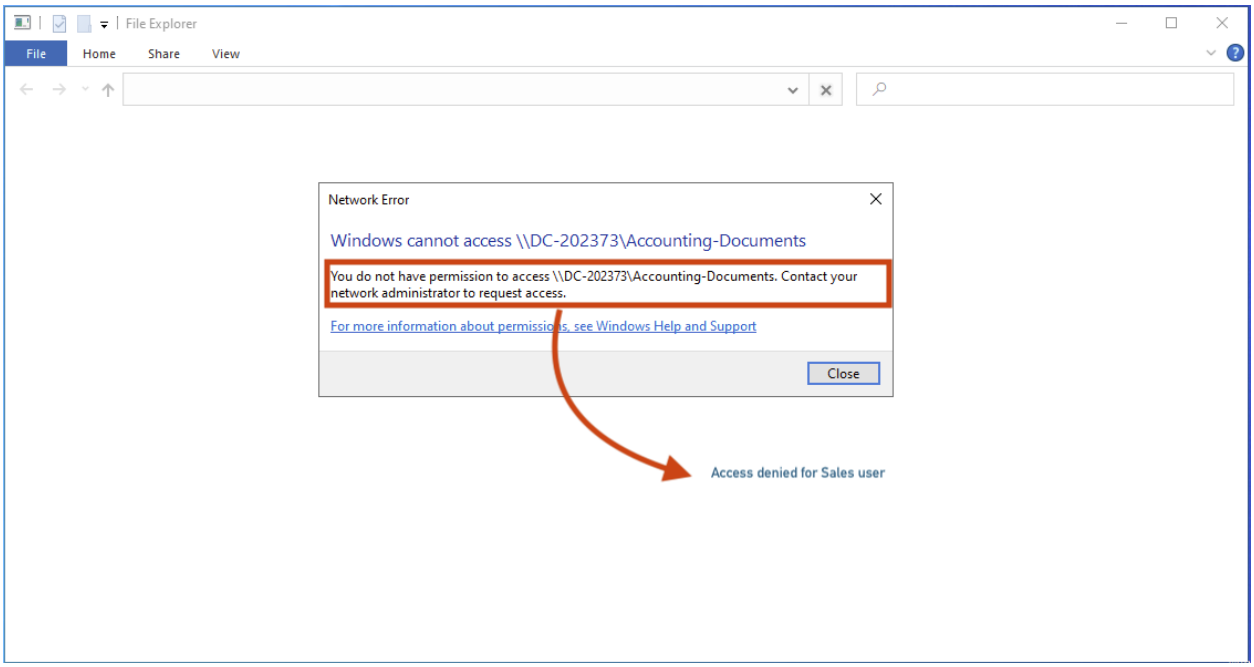
Use UNC format to check the permissions for both resources: \\Server-name\Share-name



Sales-Dublin user should be able to access Sale-Documents.

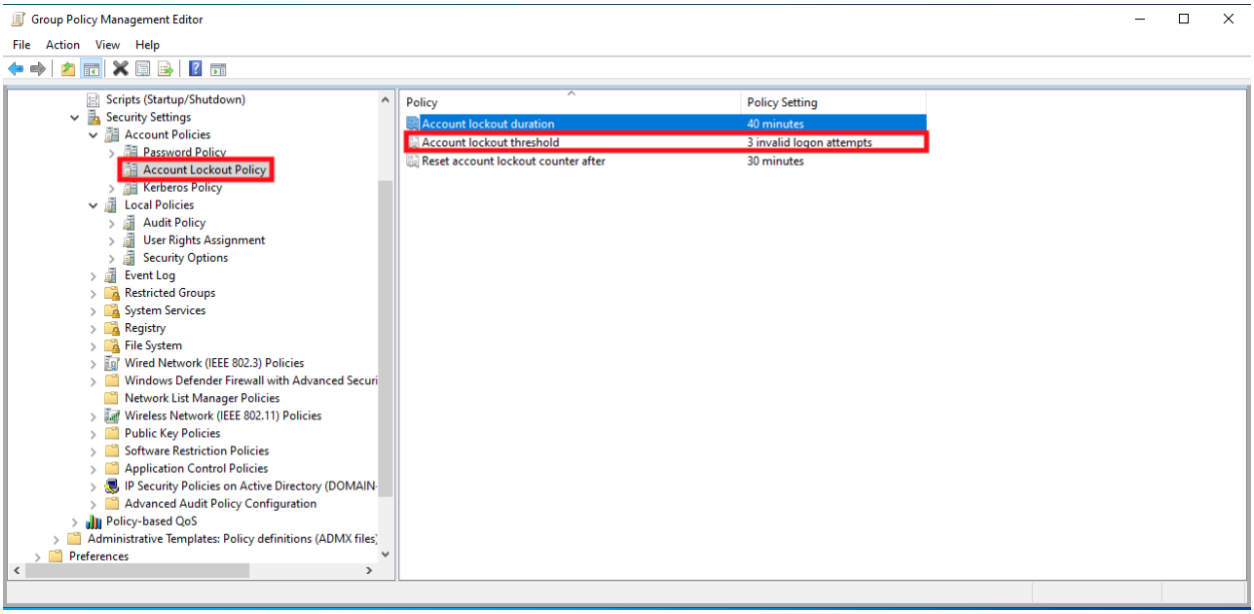


But not Accounting-Documents.

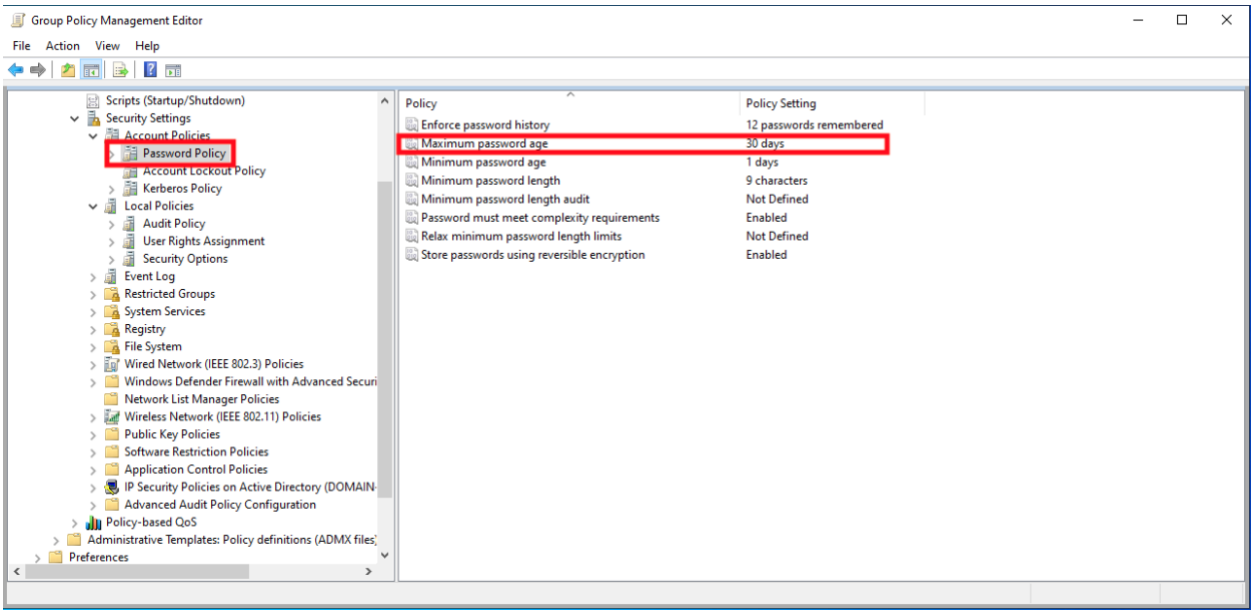


e.) Apply a suitable password policy and an account lockout policy for the entire domain.

Ensure that there is a feature to lock the account after a number of failed attempts.



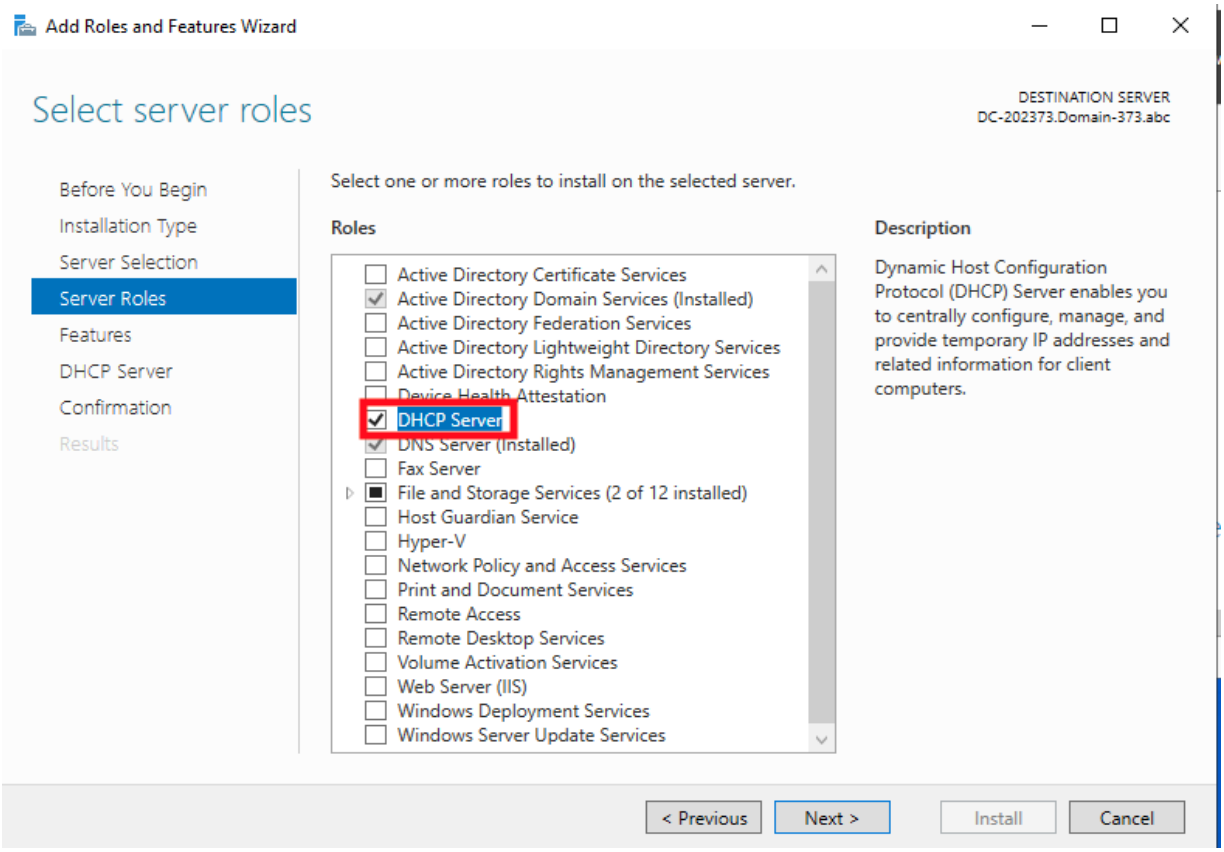
Feature that will require the user to change their password every 30 days.



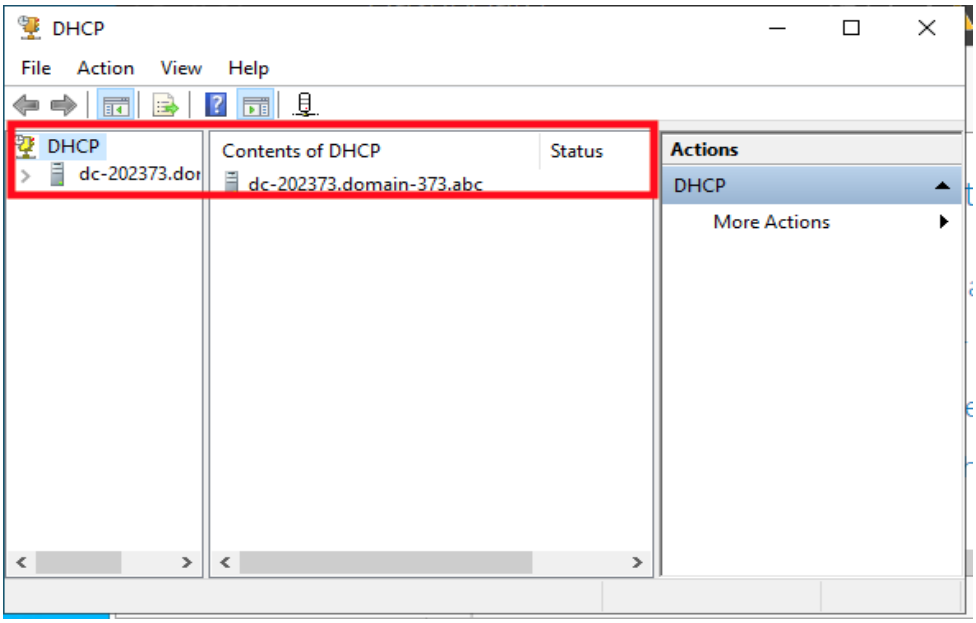
2.) Setting Up a DHCP Server for the Domain.

Your supervisor at DigiTech needs to have dynamic addresses assigned to all of the client computers in the network.

Add the DHCP server role to the Domain Controller server computer using the Add Roles and Features in the Server Manager console [for this project, you do not need to add support for WINS or IPv6].



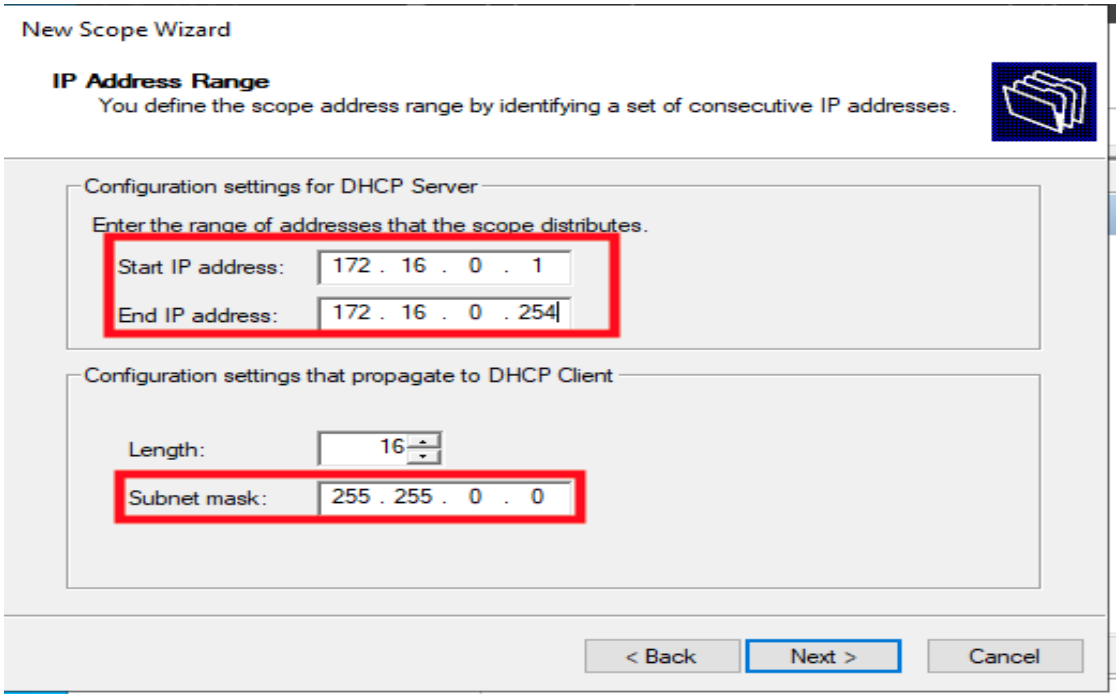
DHCP server installed.



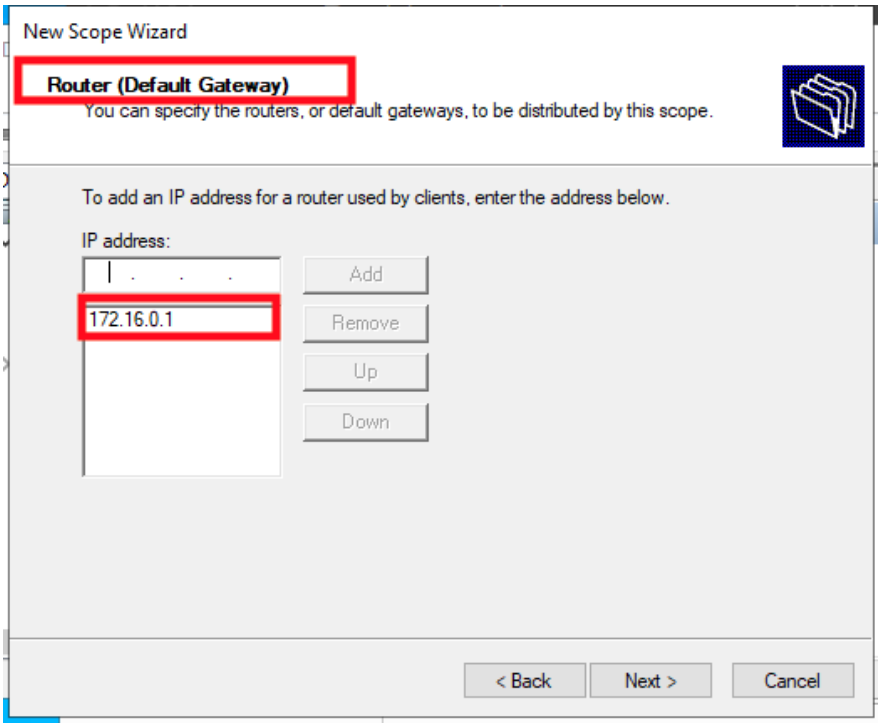
a) Configure DHCP using the DHCP console in Administrative Tools.

Use to following range of IP addresses for the IP Address Scope: The DHCP Scope Name should be the name of your Domain (such as Domain-123).

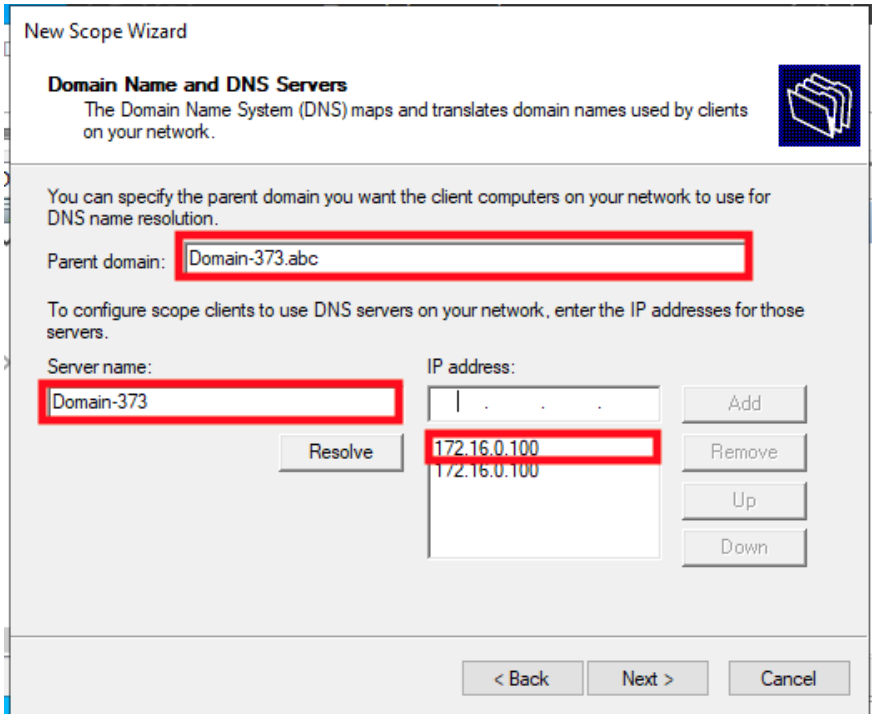
Starting IP address is 172.16.0.1 / Ending IP address is 172.16.0.254



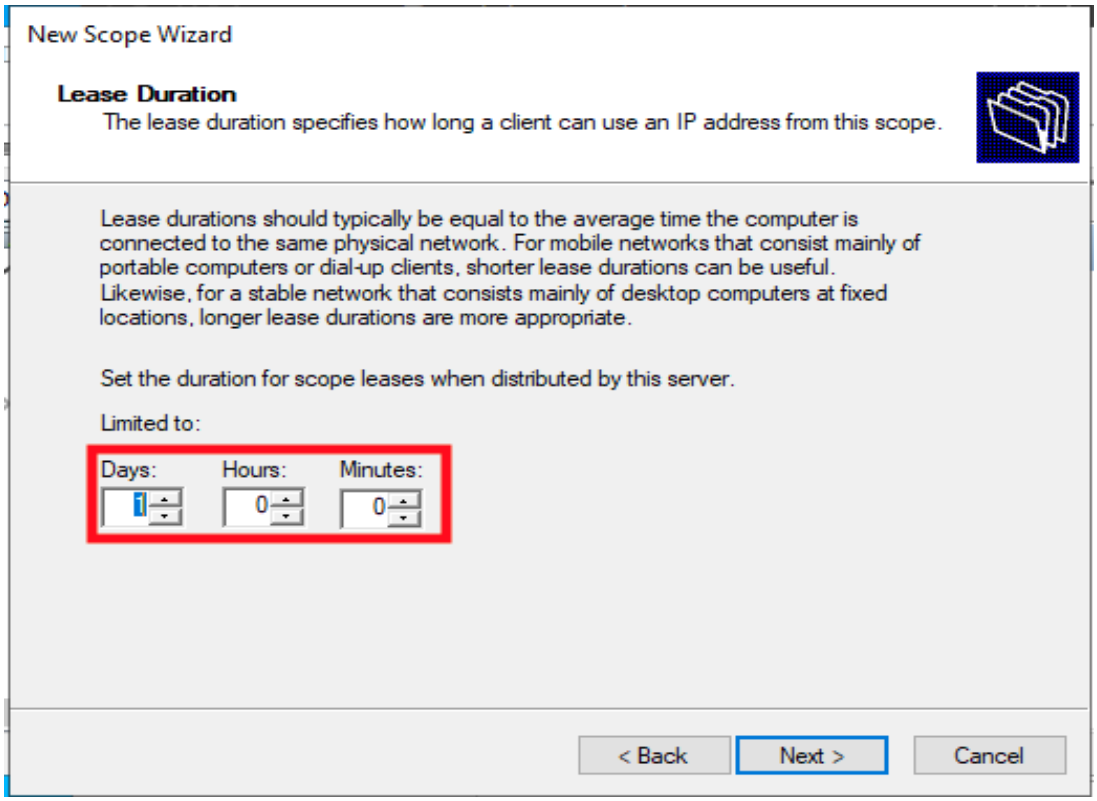
The subnet mask should be /16 and the default gateway should be 172.16.0.1.



The DNS server address should be 172.16.0.100.



The lease duration should be for 24 hours.



You will need to create four DHCP address exclusions.

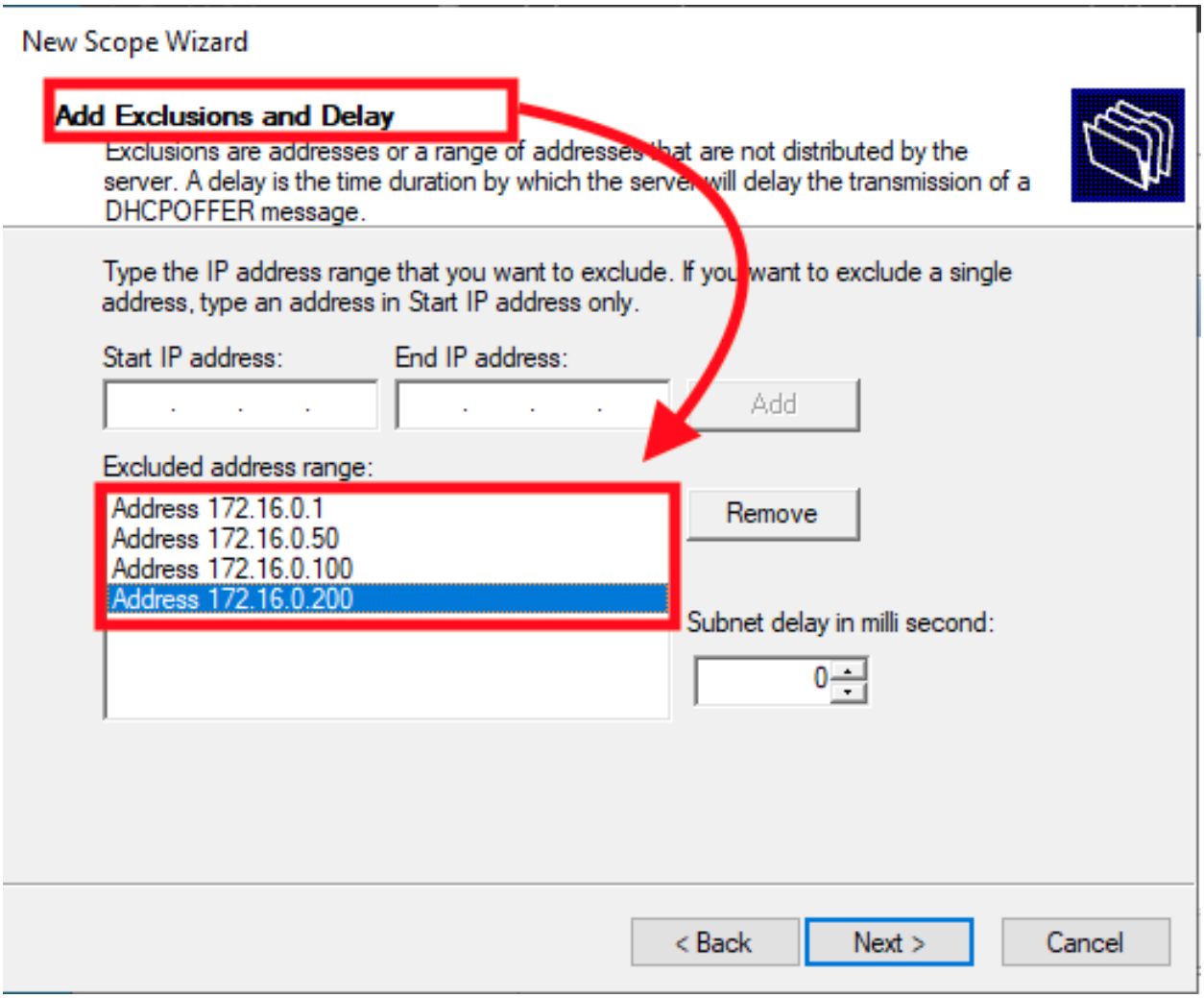
In the Address Pool create the following four exclusion ranges:

From 172.16.0.1 to 172.16.0.1

From 172.16.0.50 to 172.16.0.50

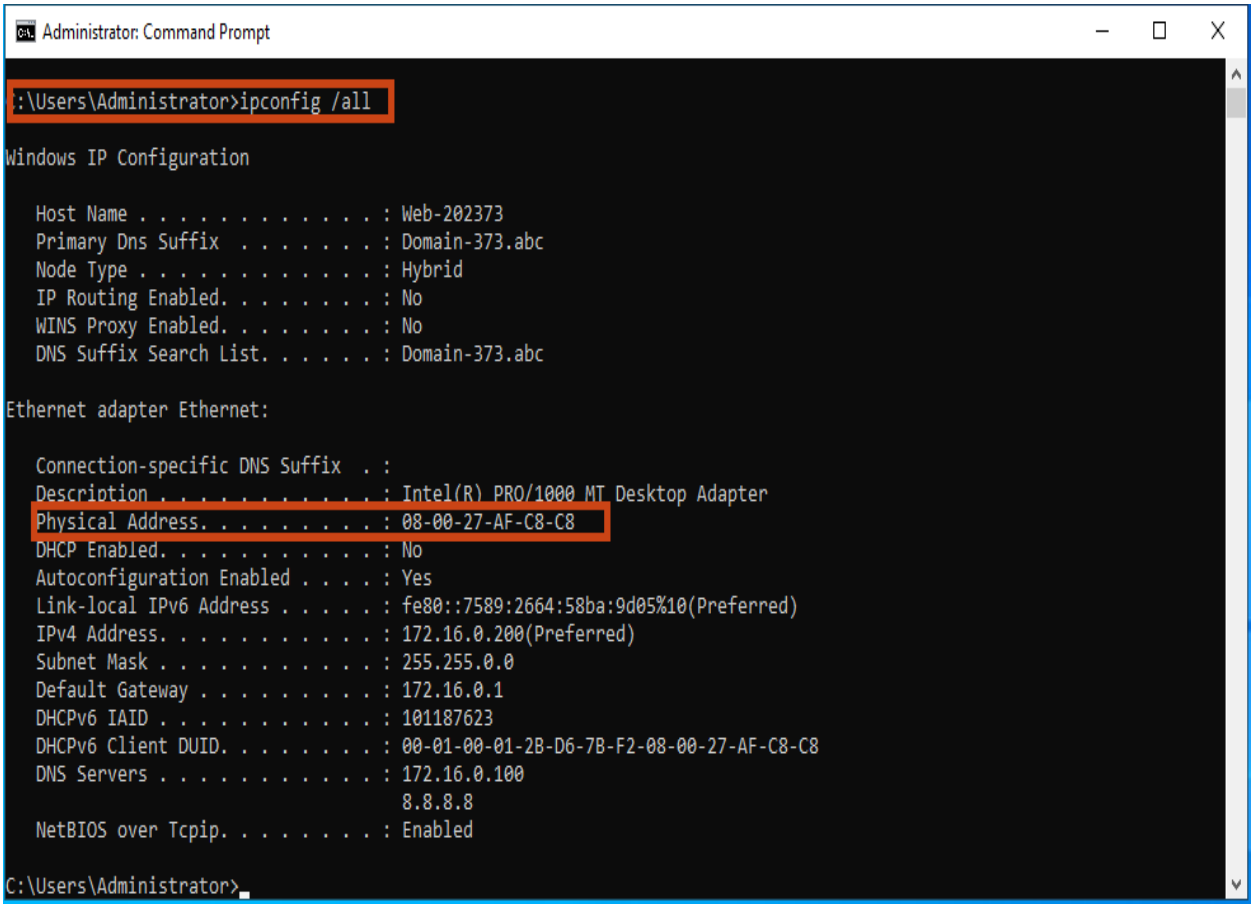
From 172.16.0.100 to 172.16.0.100

From 172.16.0.200 to 172.16.0.200

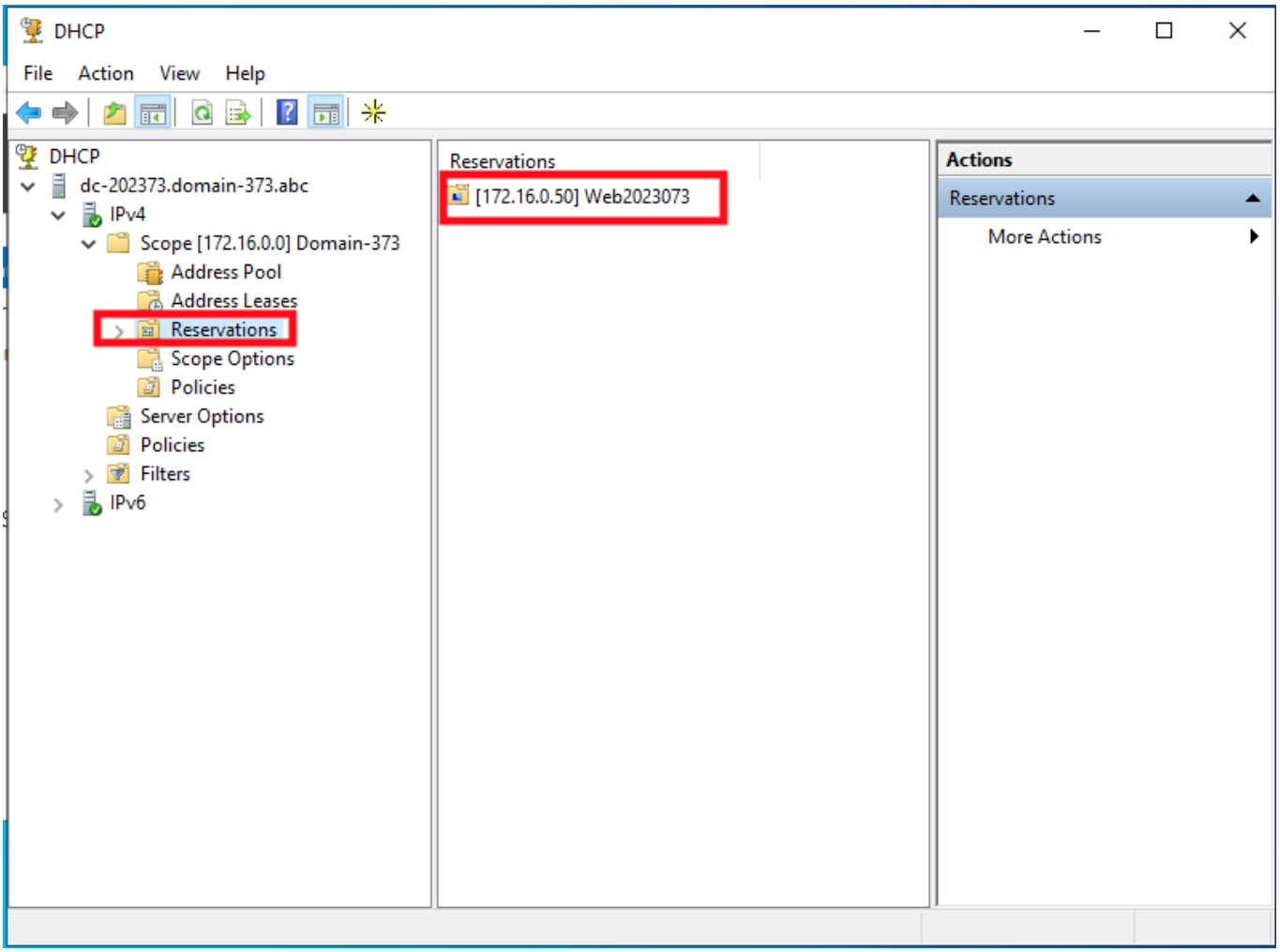


b) You will also need to create an address reservation for the Web computer… from Administrative Tools access the DHCP console.

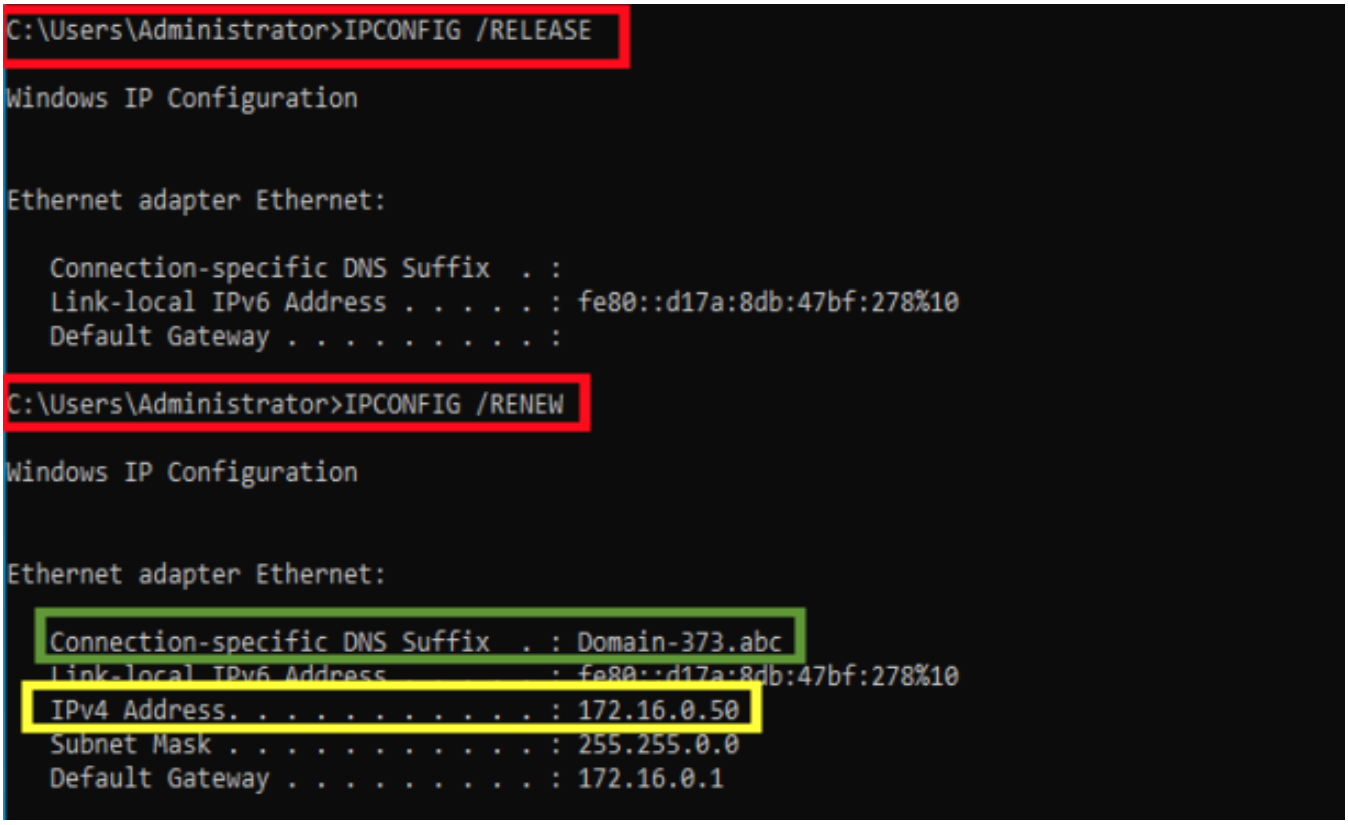
In the Web computer find the MAC address of the Network Card (IPCONFIG/ ALL)



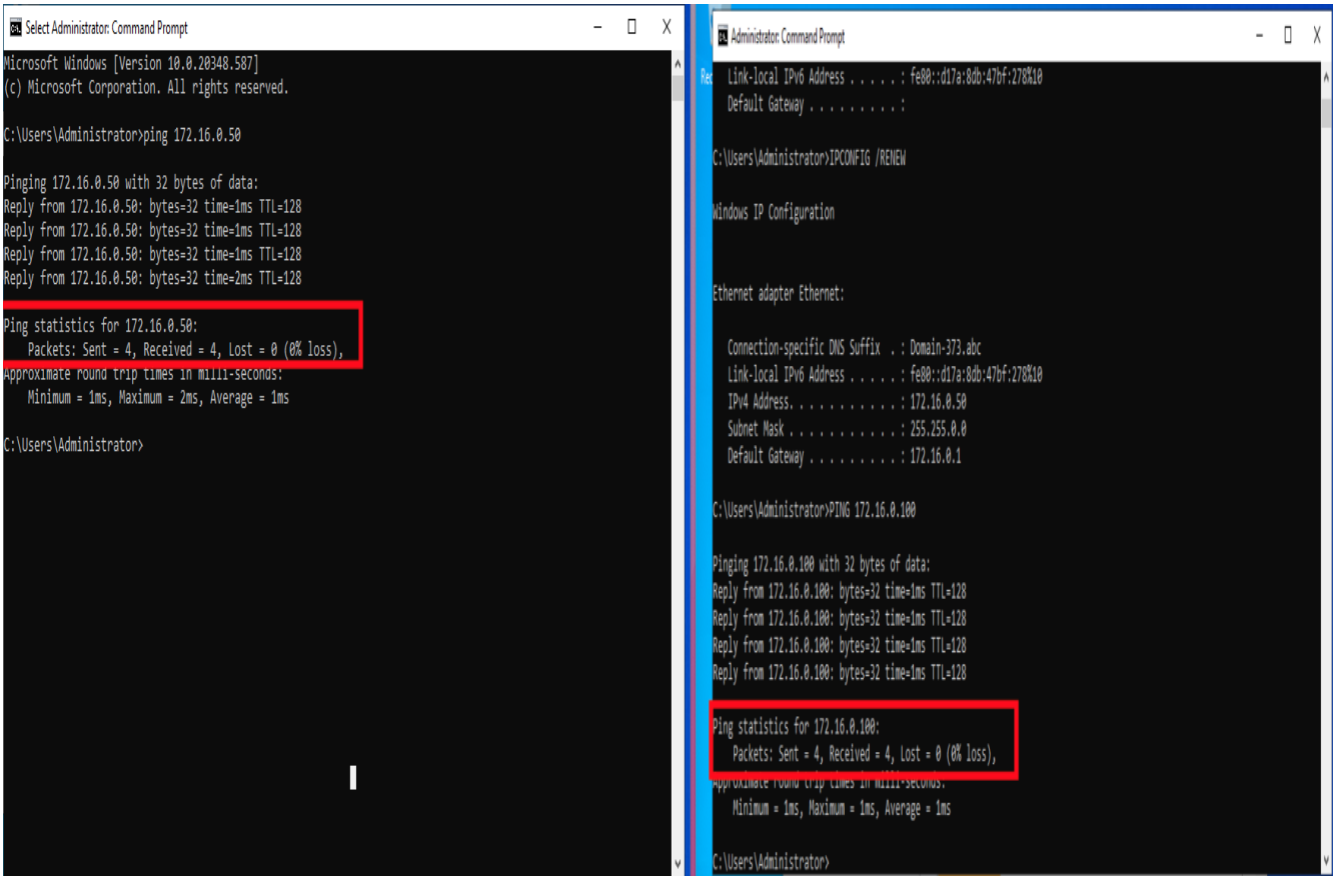
And then go to the DHCP console and make a reservation called Web 2023xyz where xyz are last digits of your student number and assign the IP address of 172.16.0.50 (description optional)


DHCP
File
Action
View
Help
DHCP
dc-202373.domain-373.abc
IPv4
Scope [172.16.0.0] Domain-373
Address Pool
Address Leases
Reservations
Scope Options
Policies
Server Options
Policies
Filters
IPv6
Reservations
[172.16.0.50] Web2023073
Actions
Reservations
More Actions

c) Configure the Web computer to dynamically receive the IP address from the reservation instead of using the static IP address (there is information that you will need to obtain from the Web computer).



Demonstrate that both computers can still ping each other.

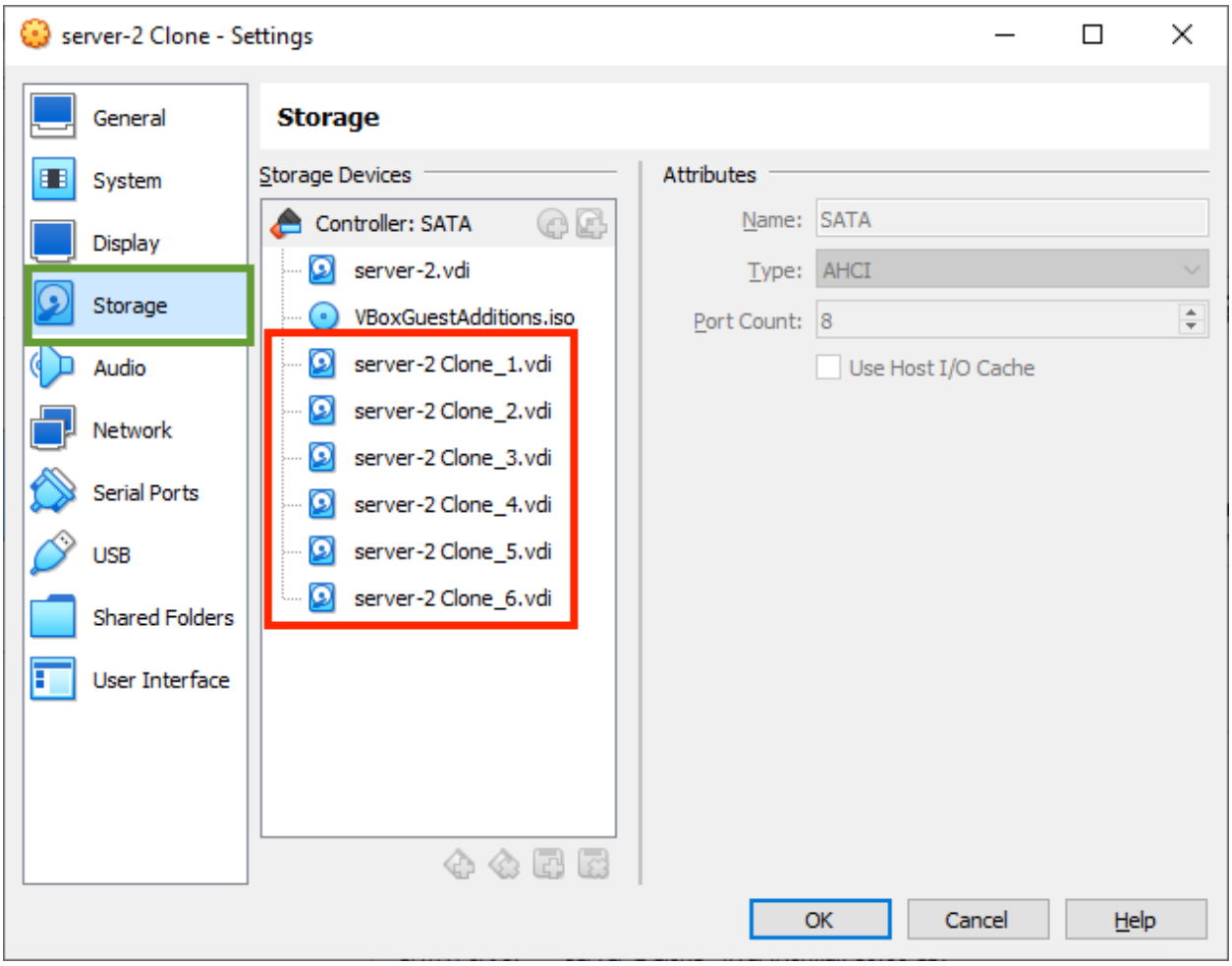


3.) Configuring RAID on the Web Server.

Your supervisor at DigiTech is concerned that the files on the Web server could accidentally deleted and they would like to see some fault tolerance added to the Web server computer.

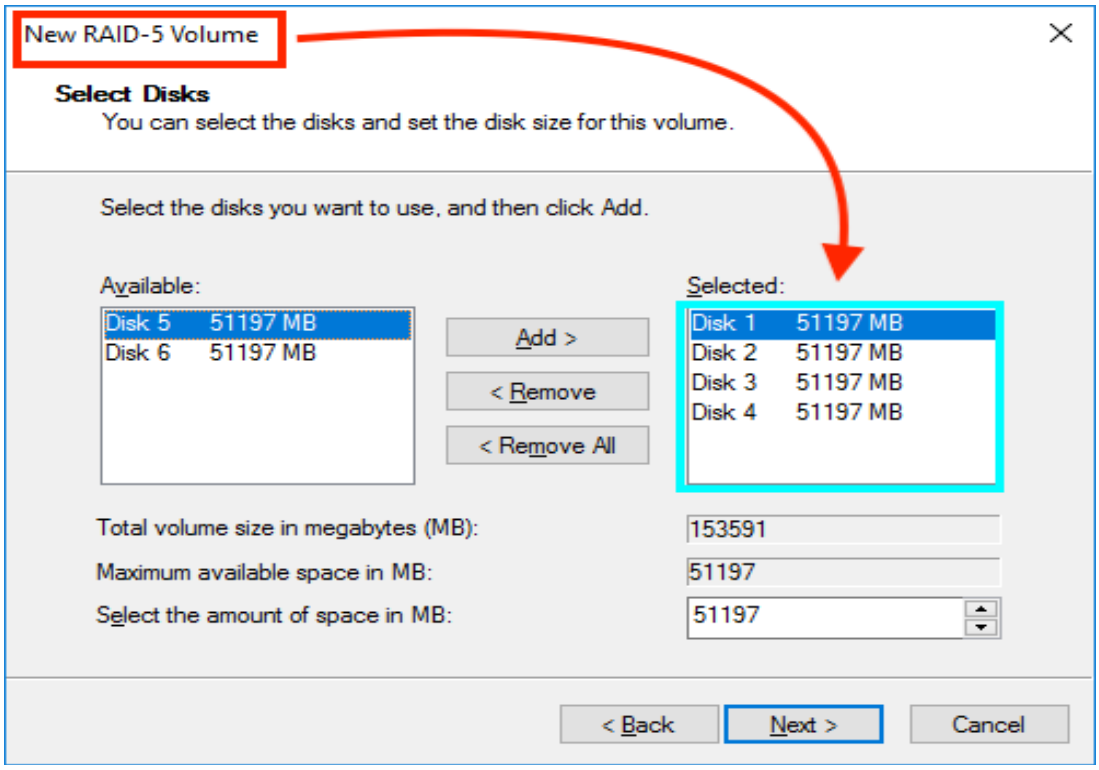
Add six additional hard drives to the Web Server VM to configure some RAID arrays on the Web server.

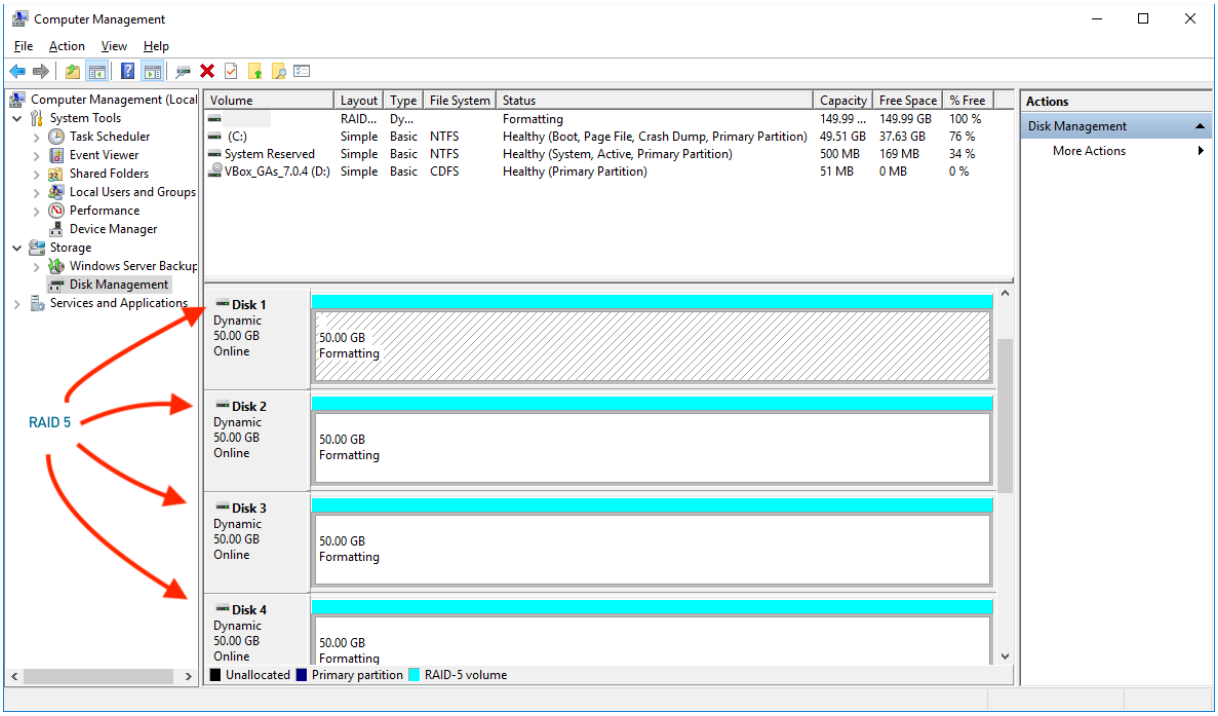
Currently Drive C: is the main volume on the computer and there is also a Drive D: which is the CDROM drive.



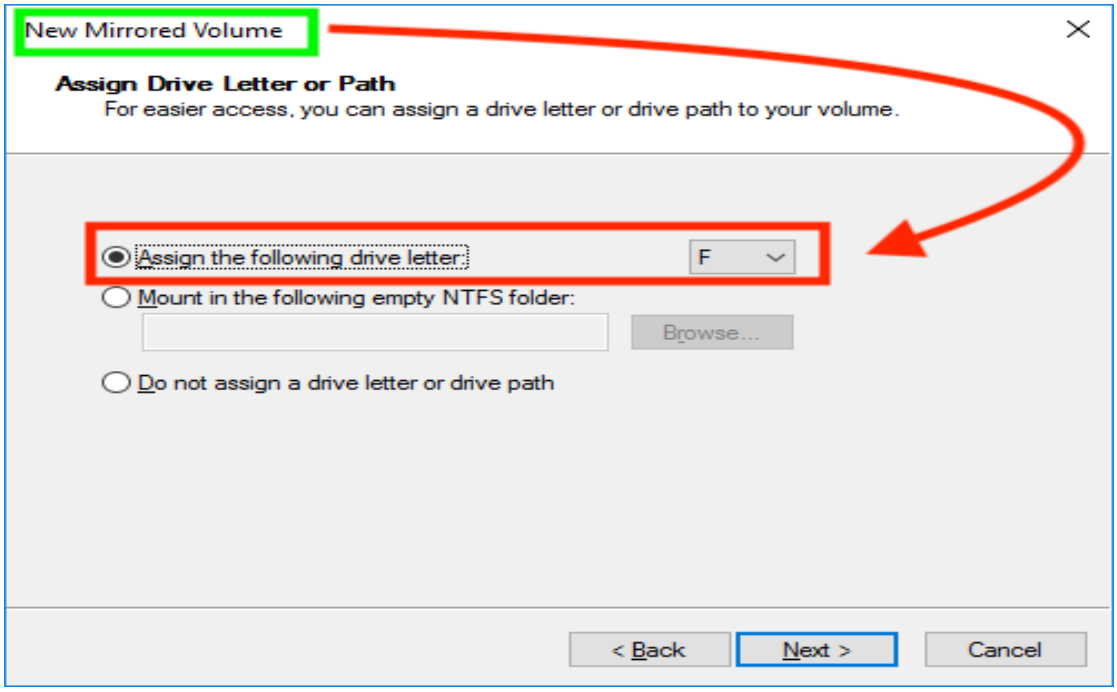
Configure the Web computer to have two new volumes that have this fault tolerance:

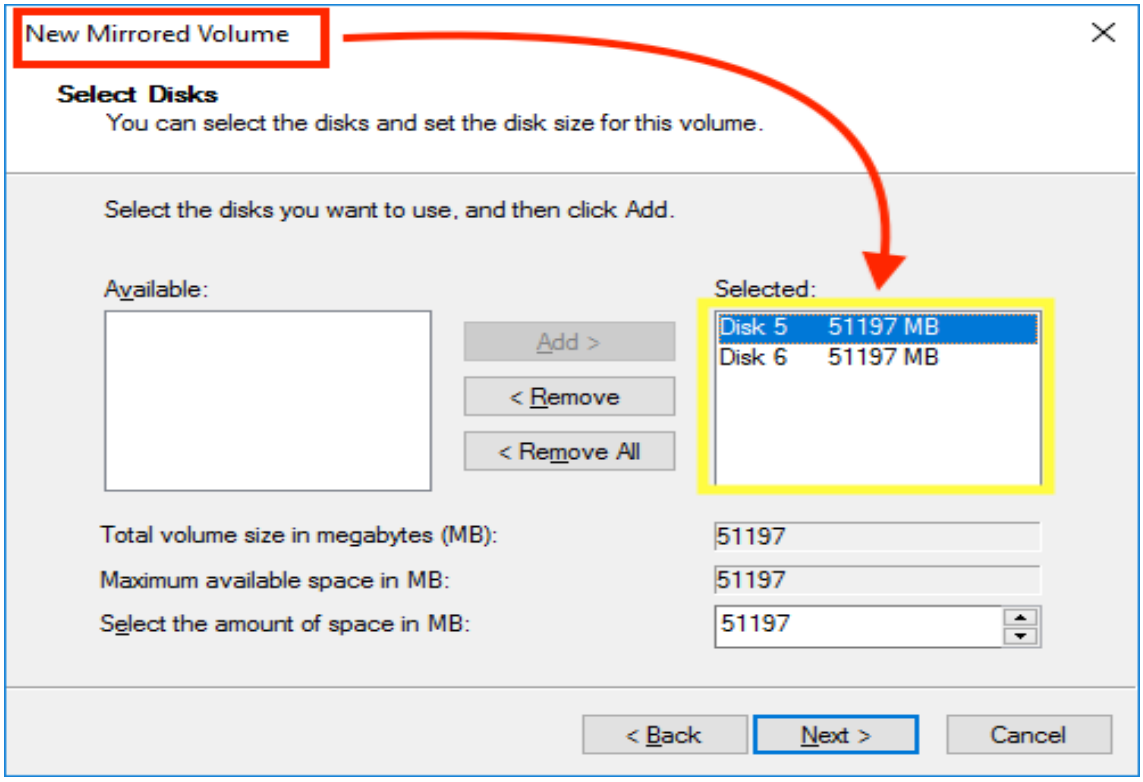
a) Use four of disks to create a RAID 5 volume which will be Drive E:





b) Use two of the hard disks to create a RAID 1 Mirrored which will be Drive F:


New Mirrored Volume
Assign Drive Letter or Path
For easier access, you can assign a drive letter or drive path to your volume.
Assign the following drive letter:
F
Mount in the following empty NTFS folder:
Browse...
Do not assign a drive letter or drive path
< Back
Next >
Cancel

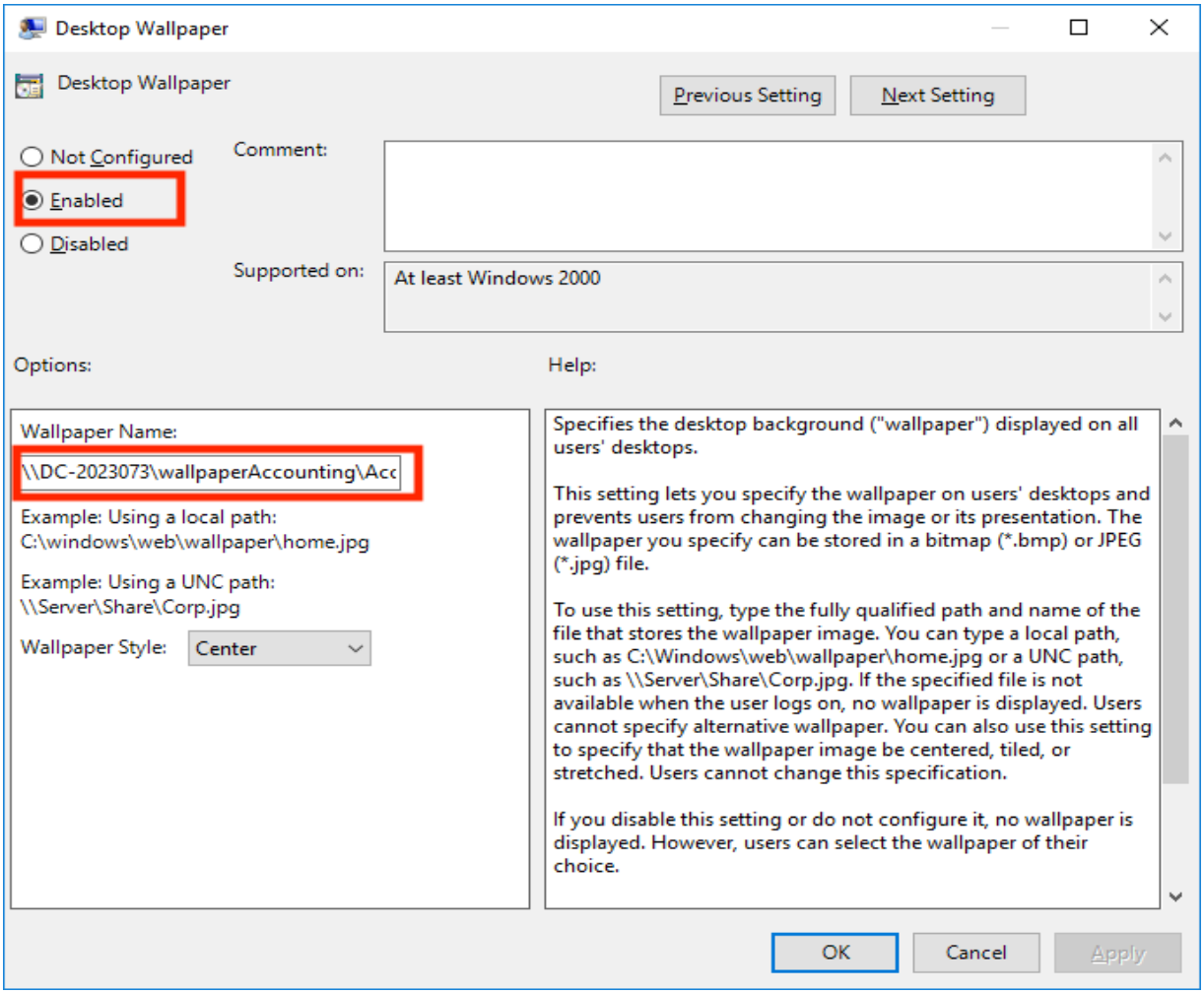

New Mirrored Volume
Select Disks
You can select the disks and set the disk size for this volume.
Select the disks you want to use, and then click Add.
Available:
Add >
< Remove
< Remove All
Selected:
Disk 5 51197 MB
Disk 6 51197 MB
Total volume size in megabytes (MB):
51197
Maximum available space in MB:
51197
Select the amount of space in MB:
51197
< Back
Next >
Cancel

4.) The tasks above provide a foundation for a network infrastructure.

Below you will find some challenge tasks that build onto of this infrastructure.

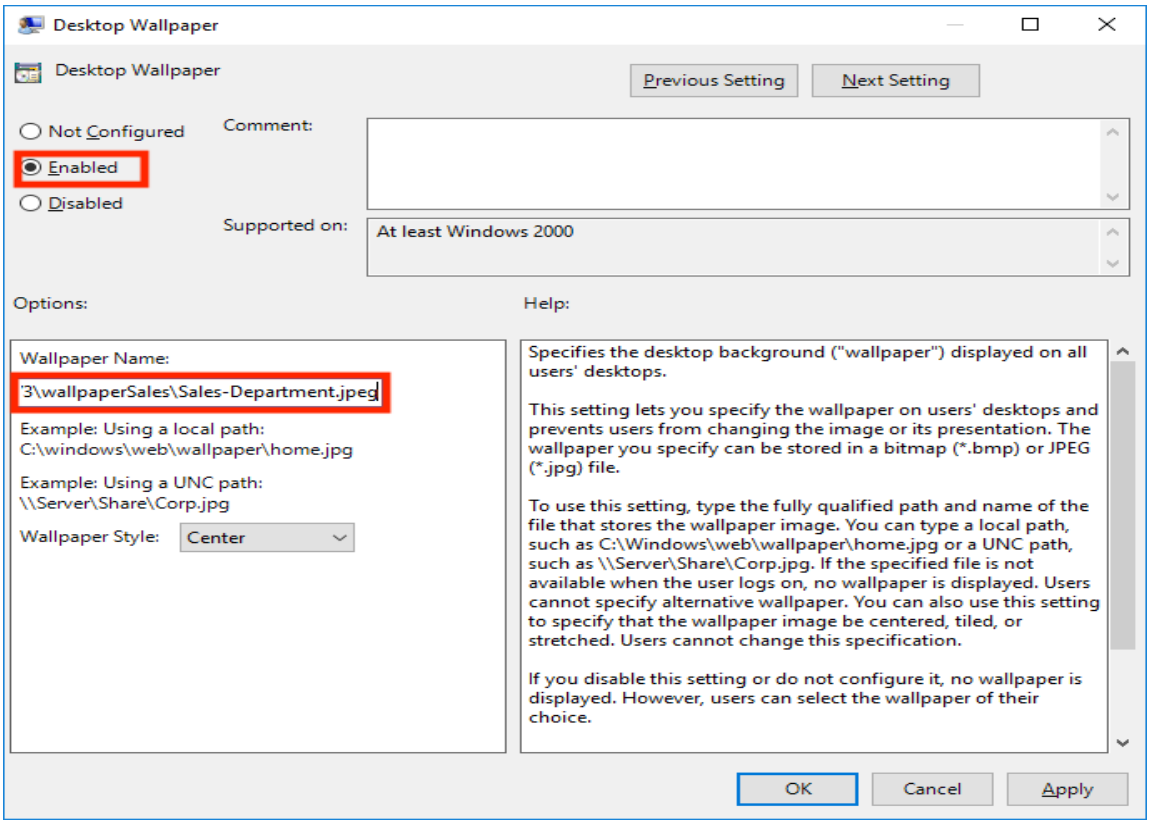
a.) The IT manager would like each department to have their own custom wallpaper for the user desktop.

Use the Sale-Department and Accounting-Department JPEG images that are posted on Moodle to set the wallpaper for each department. If a user logs in as a member of the Accounting-Department they should see the wallpaper for the Accounting department as the background on their PC.



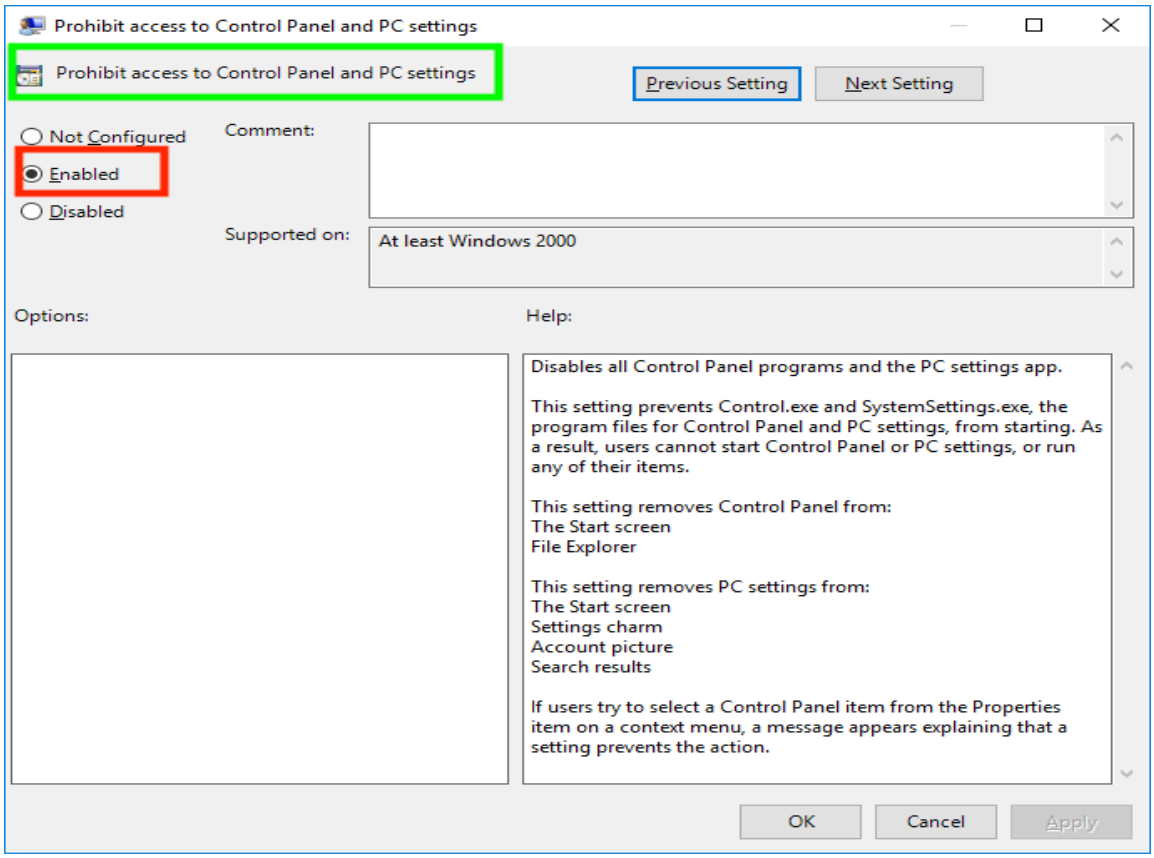

Welcome to the
ACCOUNTING
DEPARTMENT
Where EVERYBODY counts!
12:46
15/05/2023

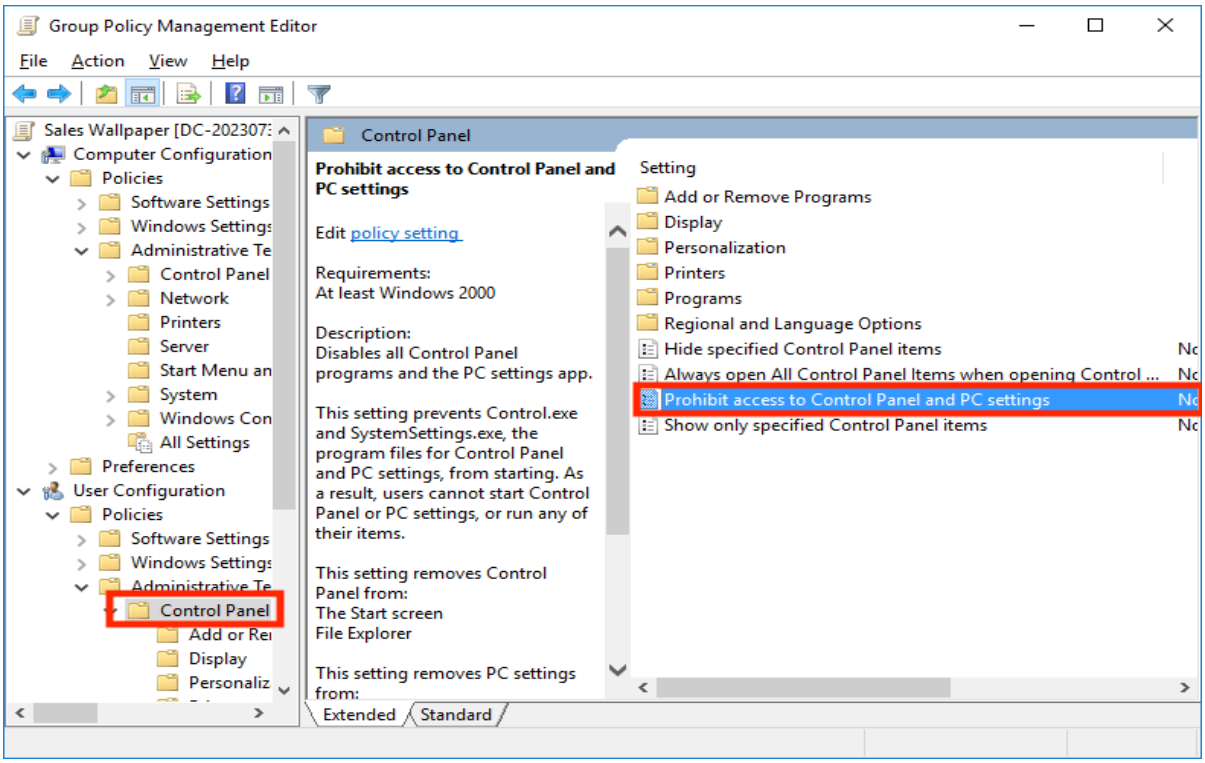
If a user logs on as a member of the SalesDepartment, they should see the wallpaper for the Sales department.

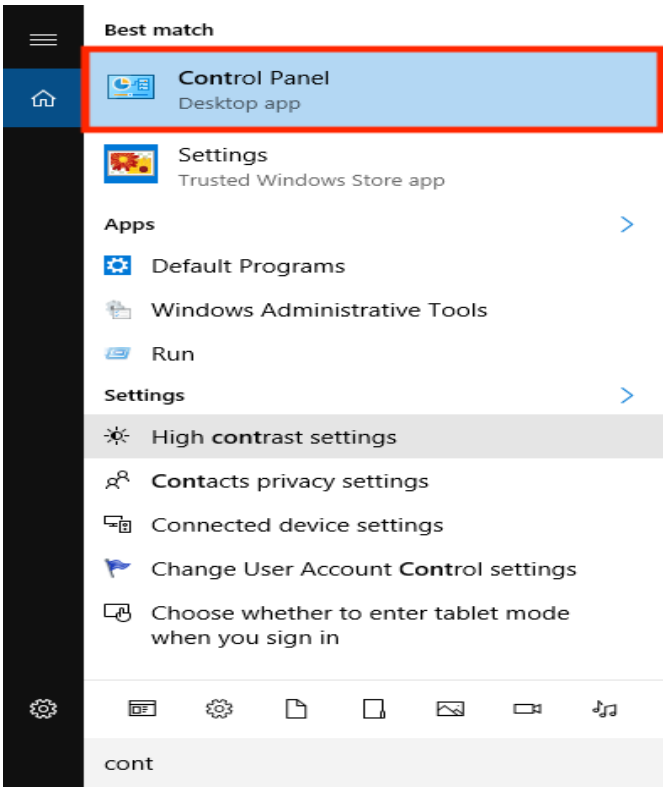


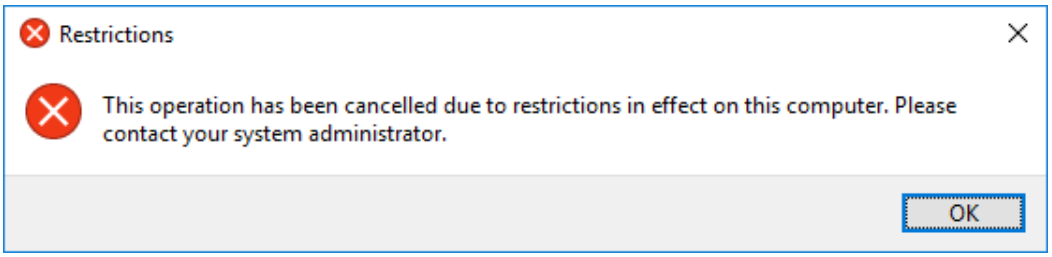
b.) *The users in both the Sales department and the accounting department have been making unauthorized changes to their systems using the Control Panel.*

The Chief information Officer (CIO) has requested that regular users do not have access to the Windows Control Panel. Use an appropriate method to remove the Control Panel from their desktop.



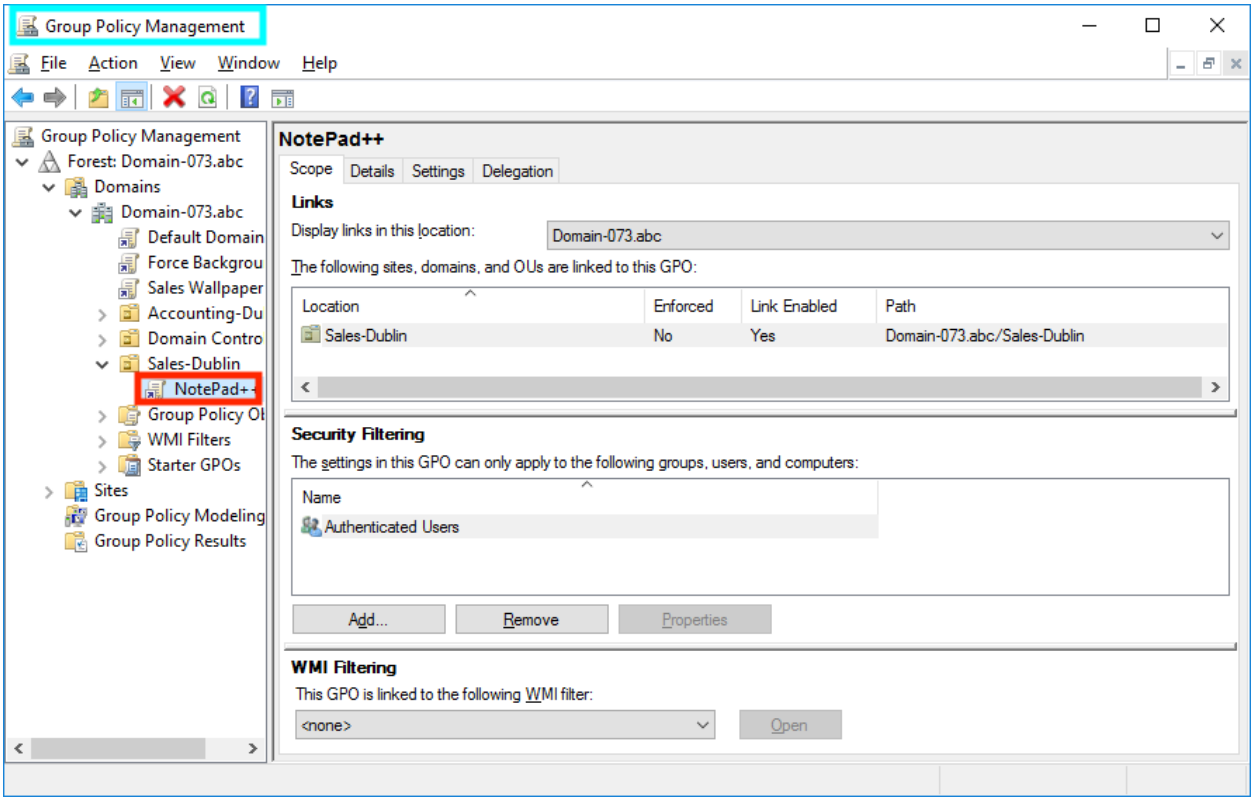

Group Policy Management Editor
File Action View Help
Sales Wallpaper [DC-202307
Computer Configuration
Policies
Software Settings
Windows Settings
Administrative Te
Control Panel
Network
Printers
Server
Start Menu an
System
Windows Con
All Settings
Preferences
User Configuration
Policies
Software Settings
Windows Settings
Administrative Te
Control Panel
Add or Rei
Display
Personaliz
Control Panel
Prohibit access to Control Panel and PC settings
Edit policy setting
Requirements:
At least Windows 2000
Description:
Disables all Control Panel programs and the PC settings app.
This setting prevents Control.exe and SystemSettings.exe, the program files for Control Panel and PC settings, from starting. As a result, users cannot start Control Panel or PC settings, or run any of their items.
This setting removes Control Panel from:
The Start screen
File Explorer
This setting removes PC settings from:
Setting
Add or Remove Programs
Display
Personalization
Printers
Programs
Regional and Language Options
Hide specified Control Panel items
Always open All Control Panel Items when opening Control ...
Prohibit access to Control Panel and PC settings
Show only specified Control Panel items
Extended
Standard

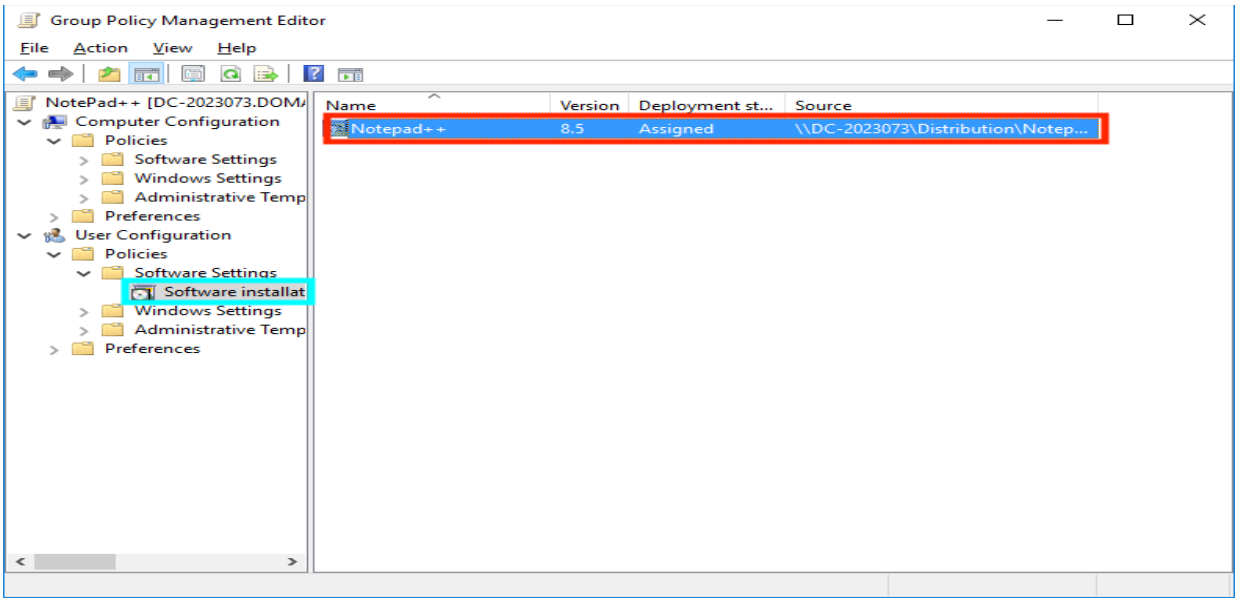

Best match
Control Panel
Desktop app
Settings
Trusted Windows Store app
Apps
Default Programs
Windows Administrative Tools
Run
Settings
High contrast settings
Contacts privacy settings
Connected device settings
Change User Account Control settings
Choose whether to enter tablet mode when you sign in
cont



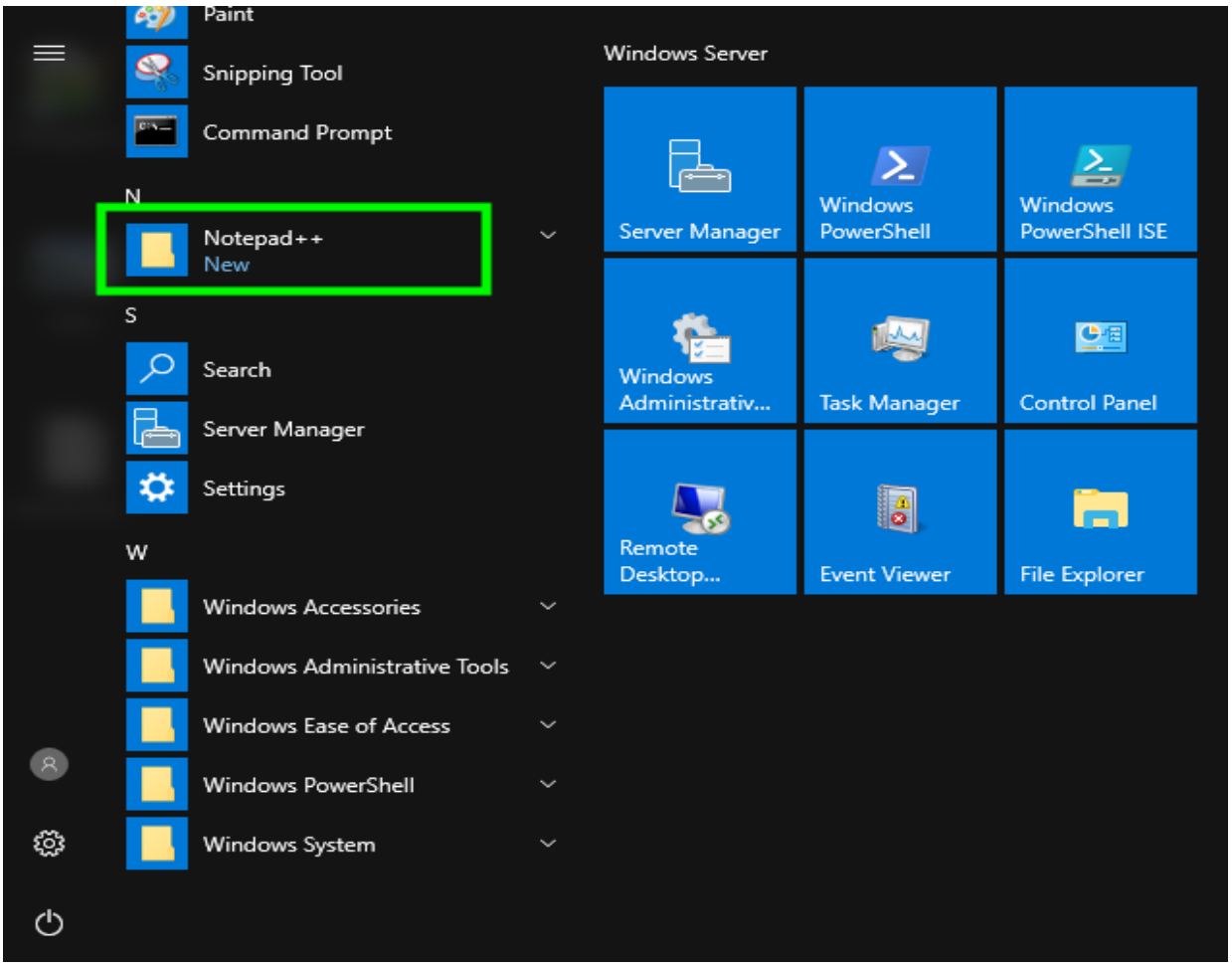
c.) Automated Software installation.

Your IT manager needs you to install software in both the Sales and Accounting departments and she needs you to do this thorough Active Directory. She needs to have Notepad++ available for the Sales department users.
You will need to create a Group Policy attached to the Sales department Organizational Unit. The policy should Assign the Notepad++ software to anyone from the Sales department who logs into the domain.





Demonstrate that you have this working by logging into the Web Server as a member of the Sales group and provide screen captures showing that Notepad++ works for a Sales user.

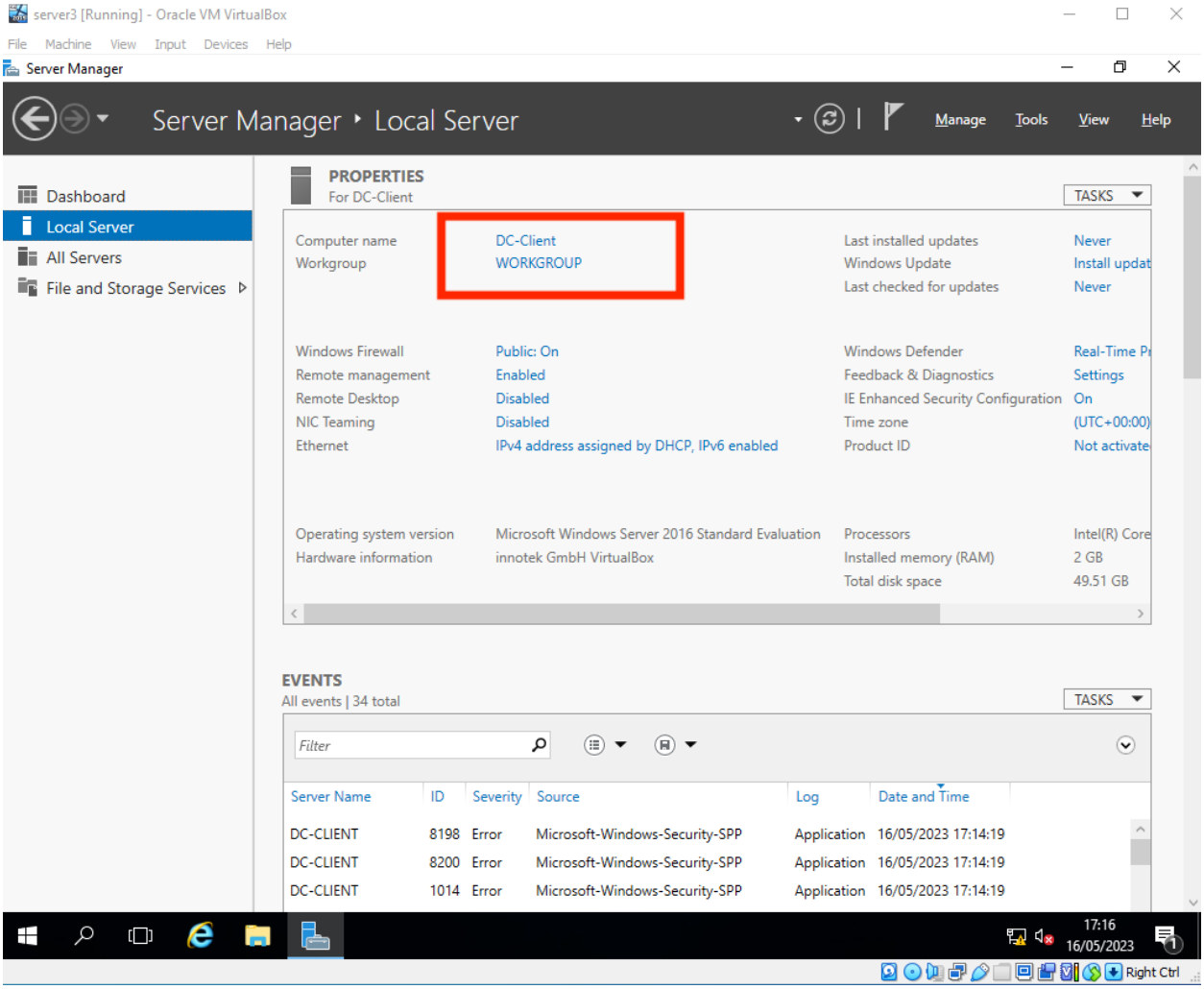



Recycle Bin
Notepad++
Notepad++ installed
SALES
DEPARTMENT
14:56
16/05/2023

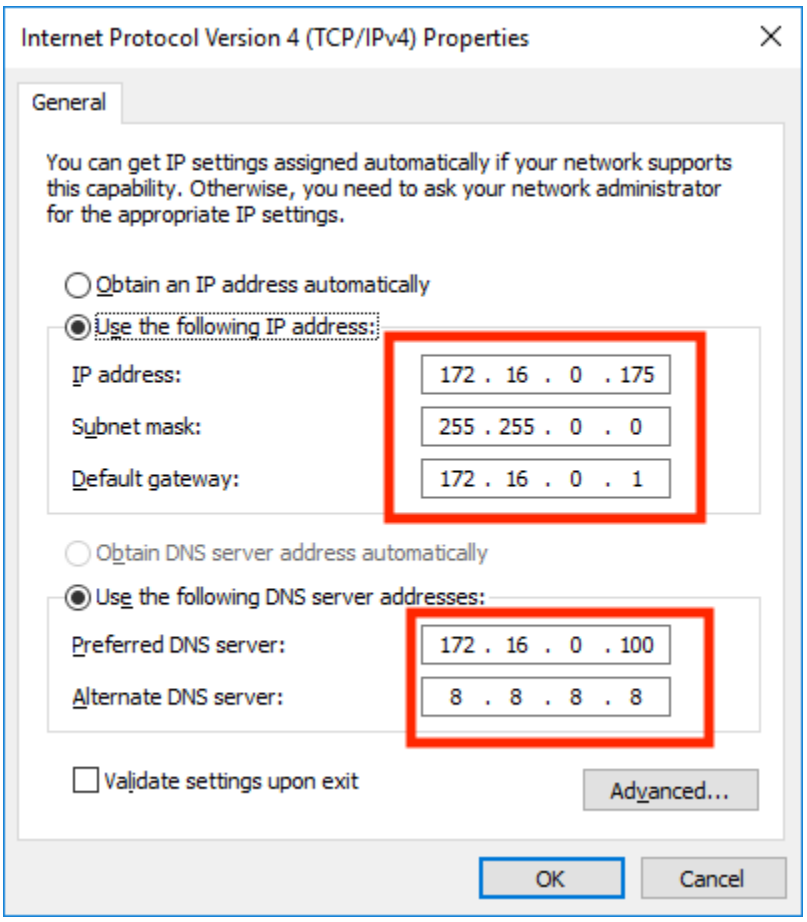
5.) PowerShell scripting

One final challenge task: This will require some research Your supervisor has heard that you have learned about PowerShell scripting and she is eager to see you demonstrate that you can speed up deployments of adding client PCs to the Active Directory domain by using this PowerShell scripting.

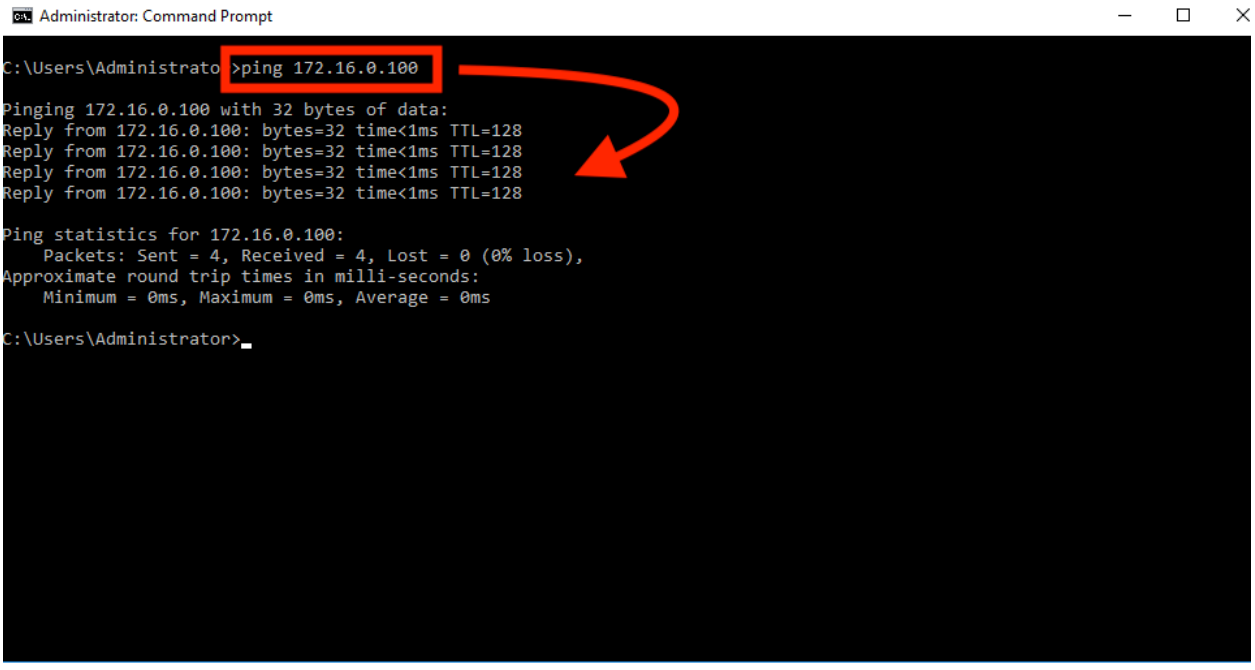
She needs you to create an additional virtual machine for this demonstration. You will name this new Windows Server VM with the name DC-Client.



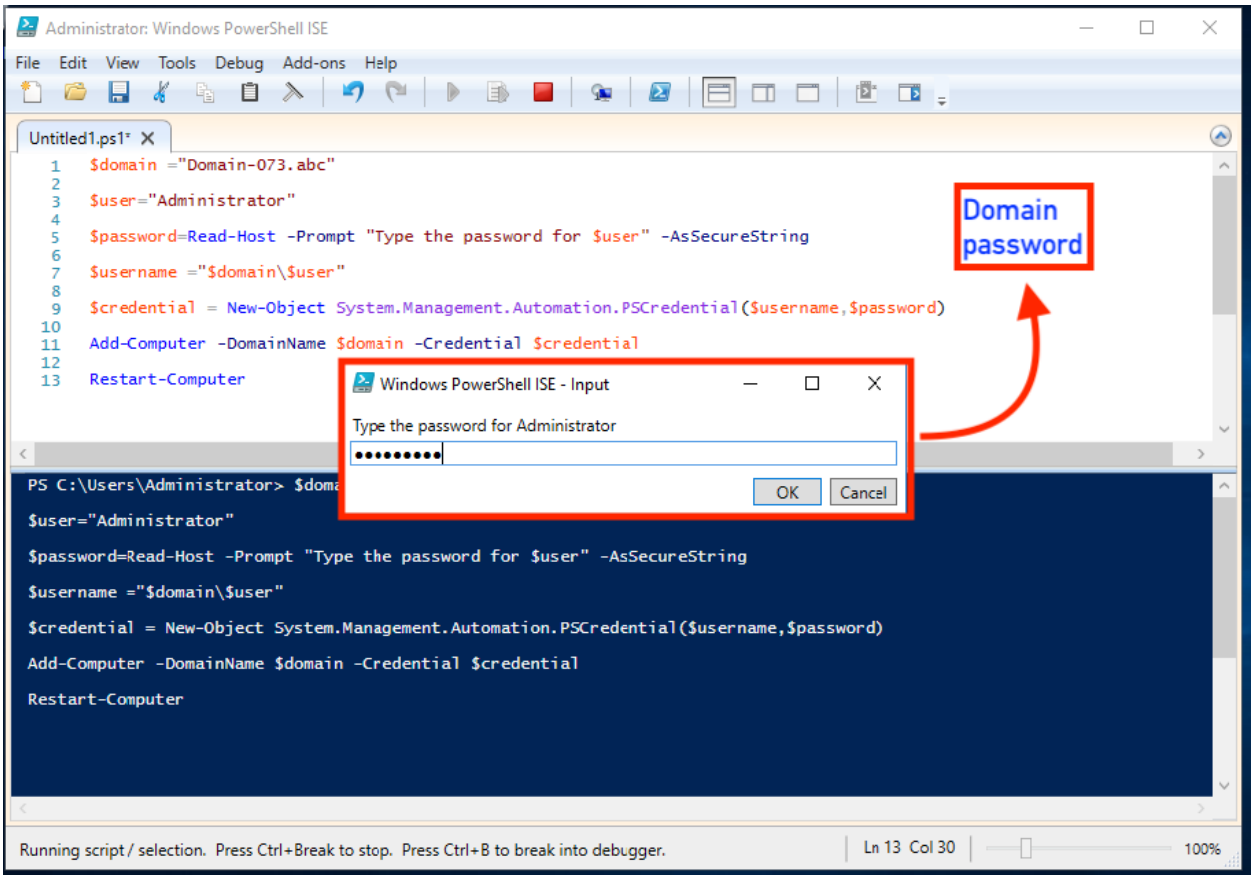
Use the following IP address configuration:
DC-Client address: 172.16.0.175/16 Note: The /16 indicates the subnet mask.
Use 172.16.0.1 as the default gateway.
for the preferred DNS Server address use 172.16.0.100
the alternate DNS Server use 8.8.8.8



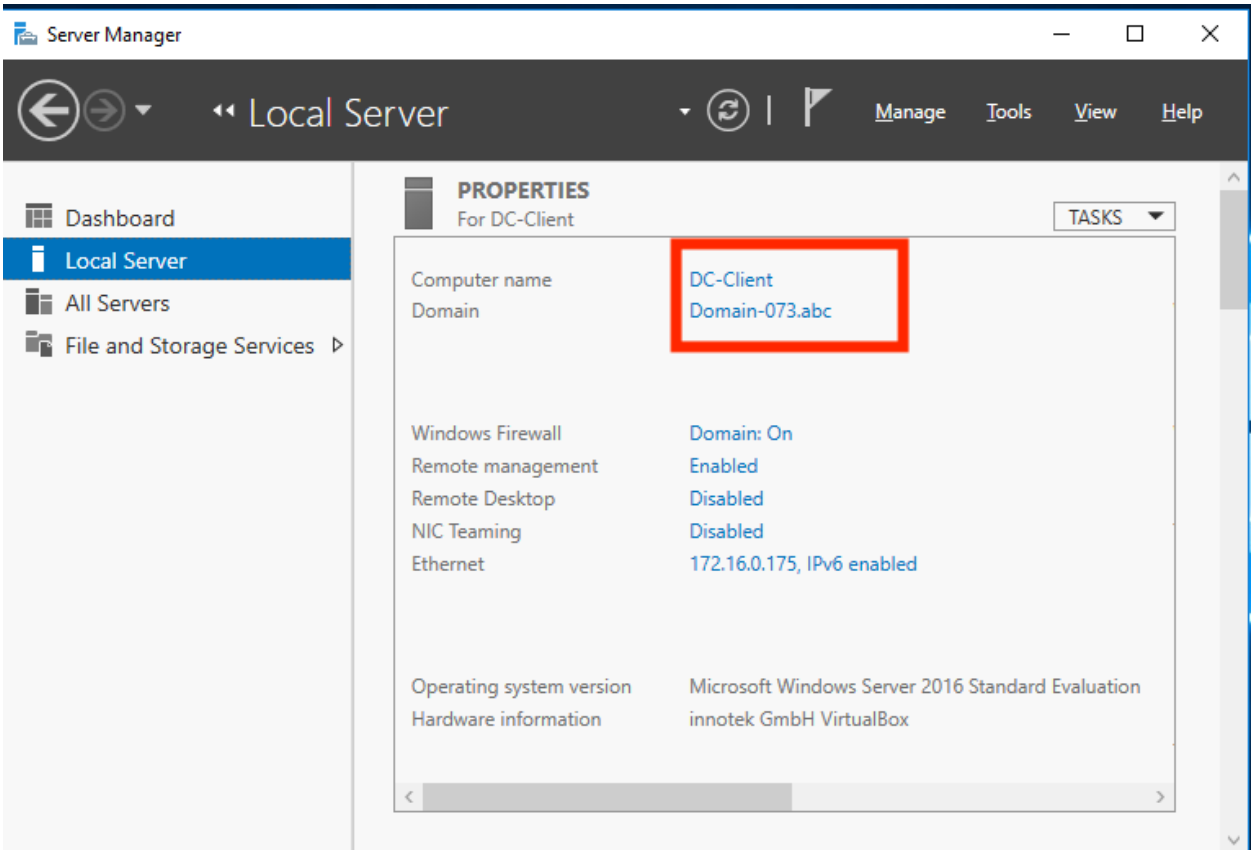
Pinging the VM-Client with the Domain.



Once you have created this new Server VM demonstrate that you can run a PowerShell Script that will add this Server to the domain when you run the script.



Server added to the Domain.



Challenges:

The project was very lucrative in terms of knowledge, the challenges were amazing, but unfortunately, I ran into a lot of problems, not because the challenges were difficult, it's because the virtual machines use a lot of memory and the devices become very slow and you have reboot virtual machines many times which wastes a lot of time. But I still have to say I enjoyed doing this project.

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