MCSA Project

:By

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Under Supervision: Eng. Saleh Mahmoud

Project Objectives

This project presents the design, implementation, and testing of a complete Windows Server–based enterprise network environment that resembles a real business IT infrastructure. The work centers on building a secure, organized, and manageable domain network using Windows Server 2019 as the core platform.

The project begins with the installation and configuration of a Primary Domain Controller (PDC) under the forest name ITISYSADMIN.com, forming the foundation of centralized user and resource management. Organizational Units (OUs) are created to represent three main departments—IT, HR, and Sales—each containing five employees, with one designated manager per department. Administrative delegation is applied so that each manager can manage users within their own department.

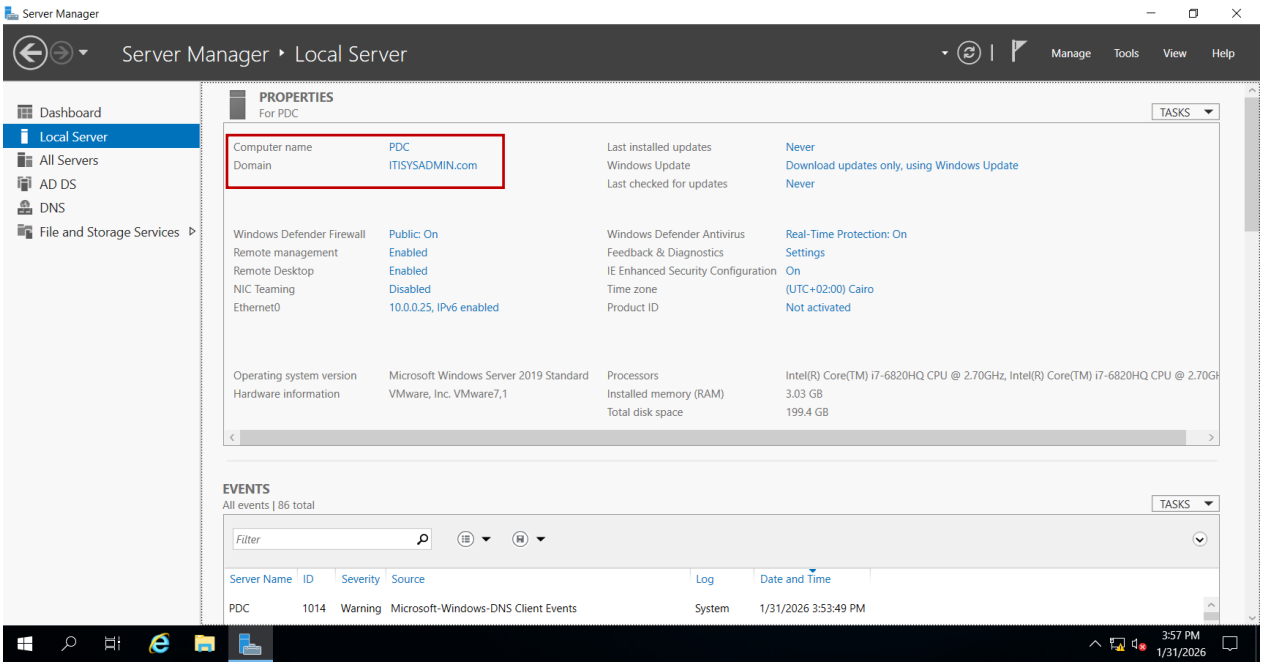
To support network connectivity, a DHCP server is configured to automatically assign IP addresses within the 10.0.0.0/24 subnet, including exclusions, reservations, MAC filtering, and configuration backup. Security and operational control are further strengthened through Group Policies (GPOs), which manage user access, desktop settings, script execution, and login time restrictions tied to business working hours and specific computers.

A shared network folder is created on the server with role-based permissions, and storage quotas are applied to selected users to prevent excessive disk usage. Advanced storage management is implemented through three different disk volumes: Spanned (read-focused), Striped (performance for writing), and Fault-Tolerant (data protection).

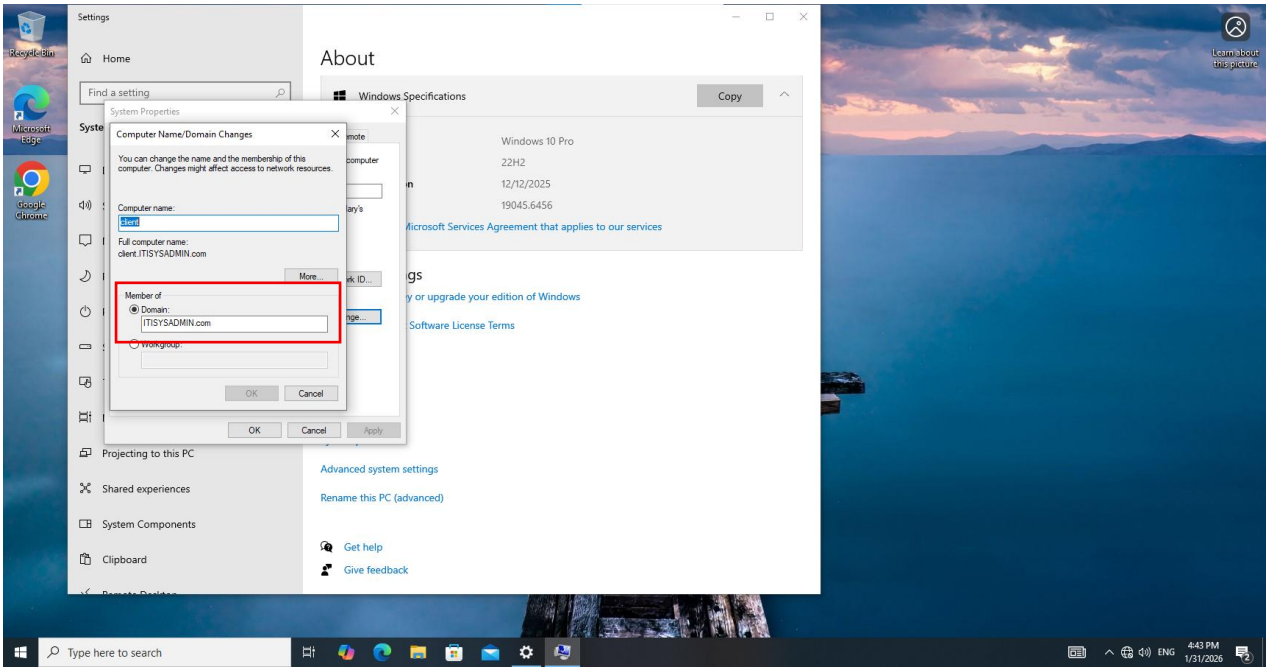
The infrastructure is expanded by adding a Child Domain Controller (NEWGRC) to provide redundancy and distributed authentication. Remote connectivity is enabled through RRAS and VPN services, allowing secure external access to the network.

Finally, all configurations are validated by joining Windows 10 client machines to the domain and testing connectivity, permissions, policies, and services, ensuring that the designed system functions as an integrated and reliable enterprise network.

Primary Domain controller: ITISYSADMIN.com

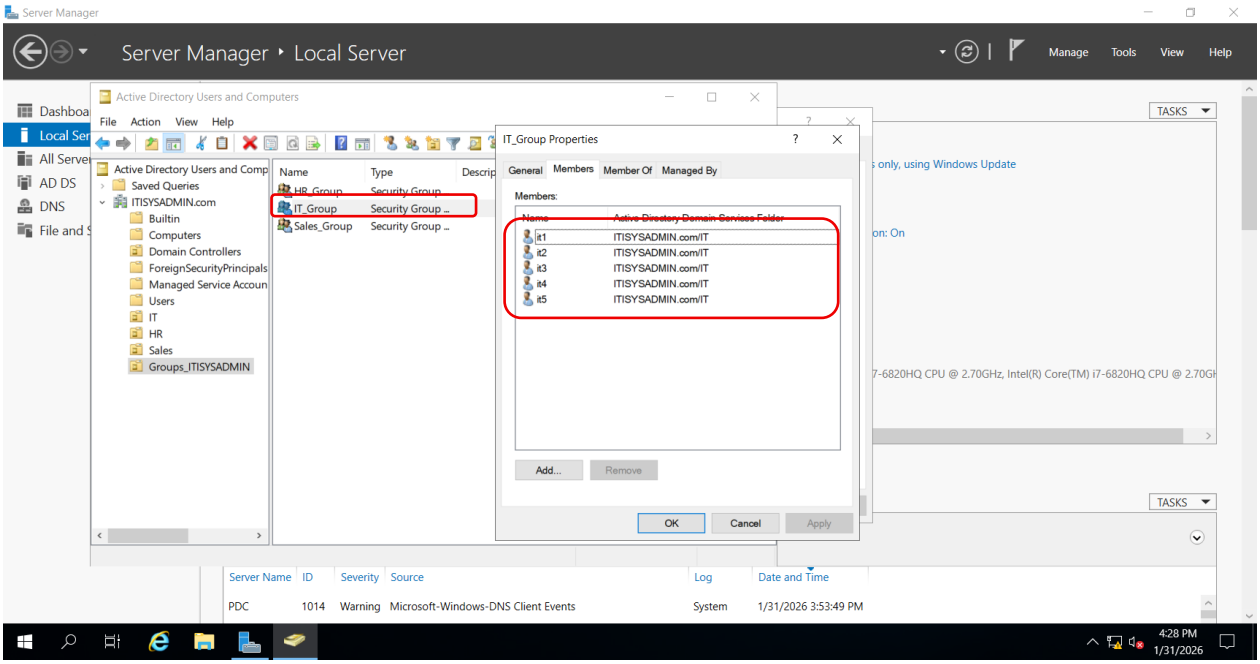


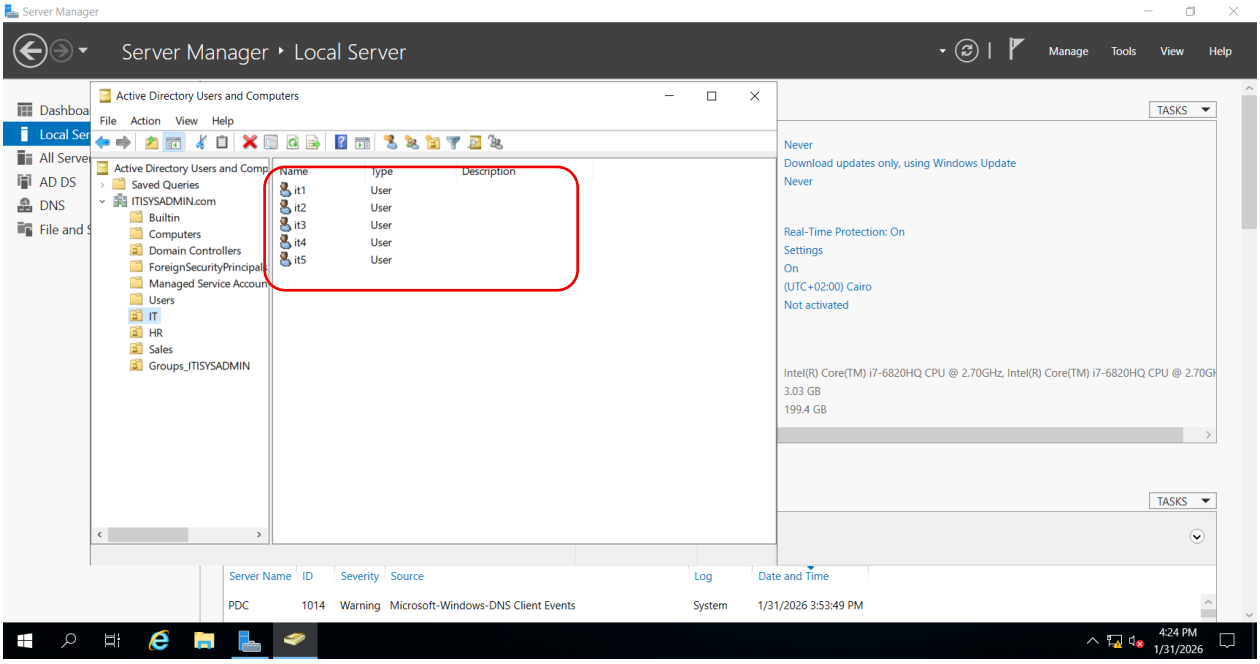
client joined to domain:



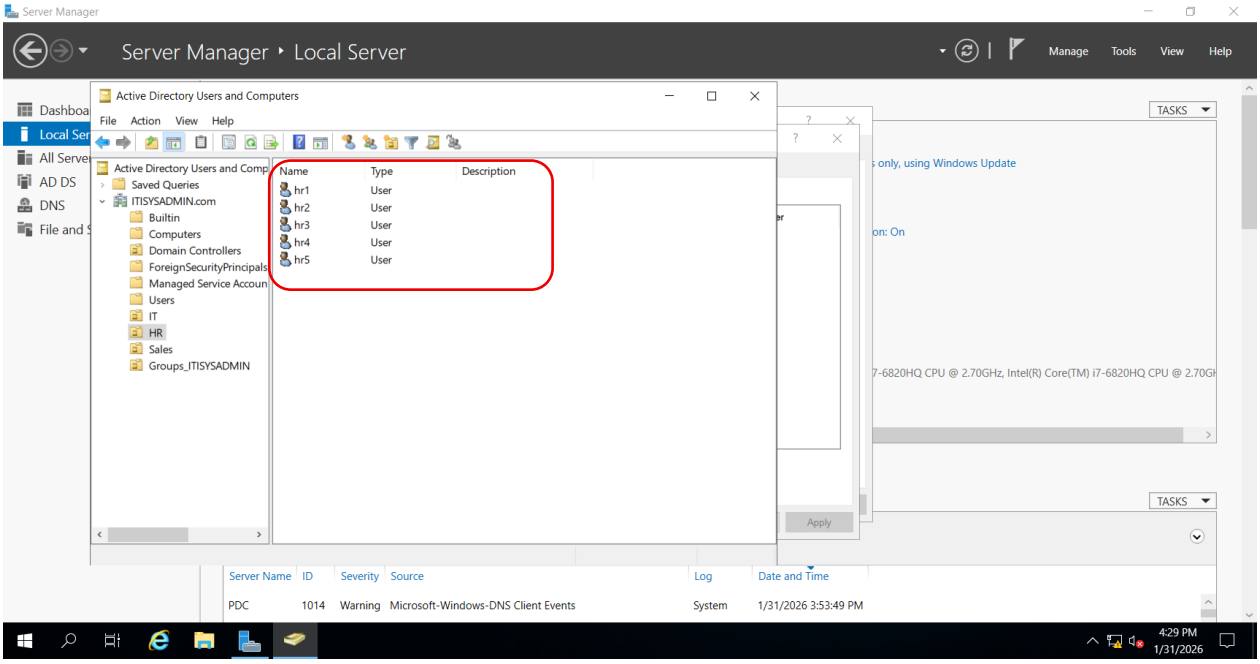
Department IT, HR, Sales:

IT





HR


Server Manager
Server Manager ‣ Local Server
Manage
Tools
View
Help
Active Directory Users and Computers
File
Action
View
Help
Active Directory Users and Comp
Saved Queries
ITISYSADMIN.com
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Domain Controllers
ForeignSecurityPrincipals
Managed Service Accoun
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hr1
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hr3
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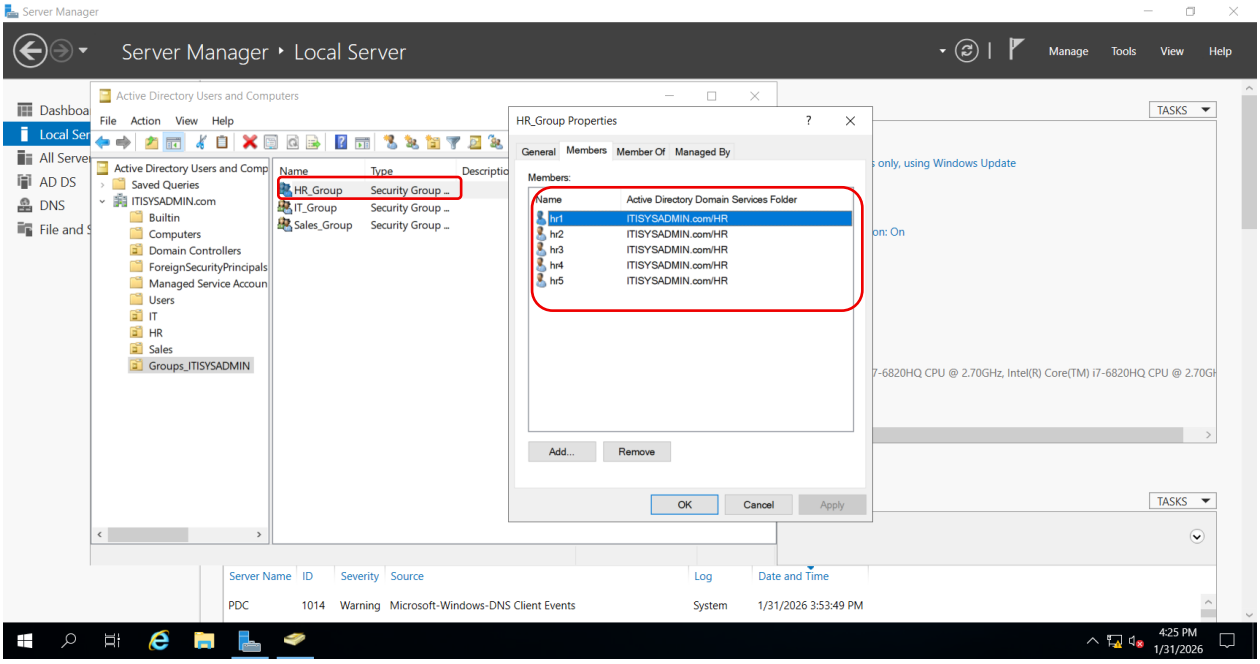
Source
Log
Date and Time
PDC
1014
Warning
Microsoft-Windows-DNS Client Events
System
1/31/2026 3:53:49 PM
4:29 PM
1/31/2026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Builtin
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Domain Controllers
ForeignSecurityPrincipals
Managed Service Accoun
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IT_Group
Security Group ...
Sales_Group
Security Group ...
HR_Group Properties
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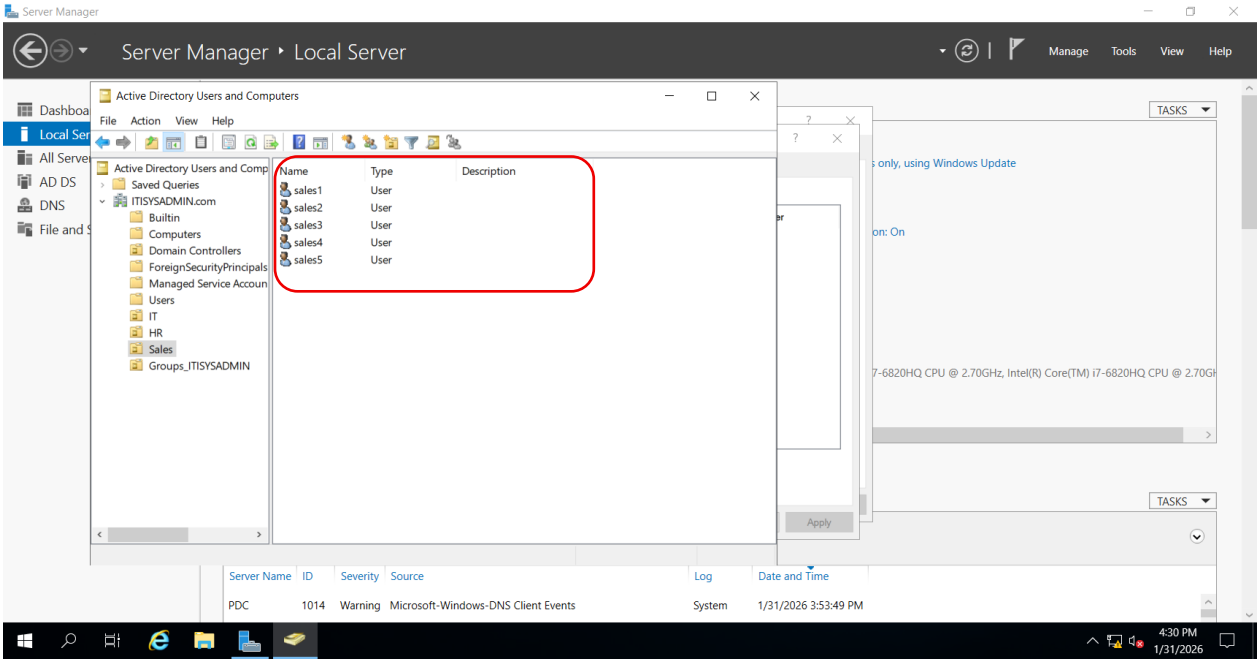
Members
Member Of
Managed By
Members:
Name
Active Directory Domain Services Folder
hr1
ITISYSADMIN.com/HR
hr2
ITISYSADMIN.com/HR
hr3
ITISYSADMIN.com/HR
hr4
ITISYSADMIN.com/HR
hr5
ITISYSADMIN.com/HR
Add...
Remove
OK
Cancel
Apply
TASKS
Server Name
ID
Severity
Source
Log
Date and Time
PDC
1014
Warning
Microsoft-Windows-DNS Client Events
System
1/31/2026 3:53:49 PM
4:25 PM
1/31/2026

Sales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User
sales2
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sales3
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sales4
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sales5
User
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TASKS
Server Name
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Severity
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Warning
Microsoft-Windows-DNS Client Events
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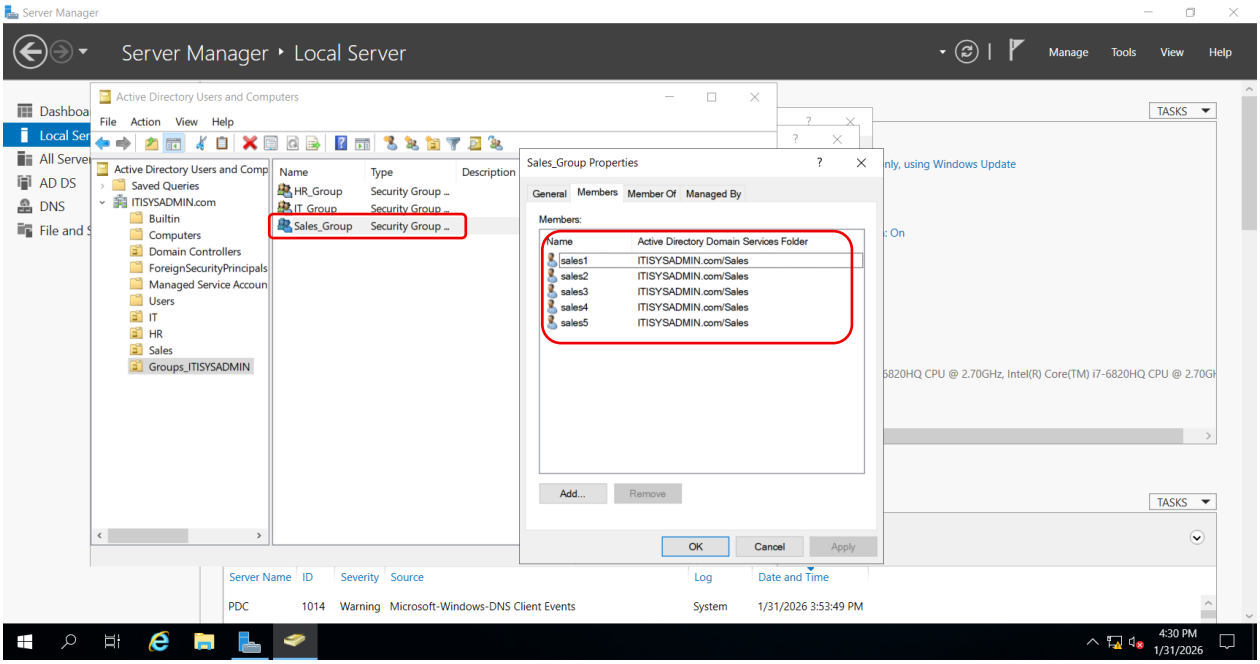
1/31/2026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ITISYSADMIN.com
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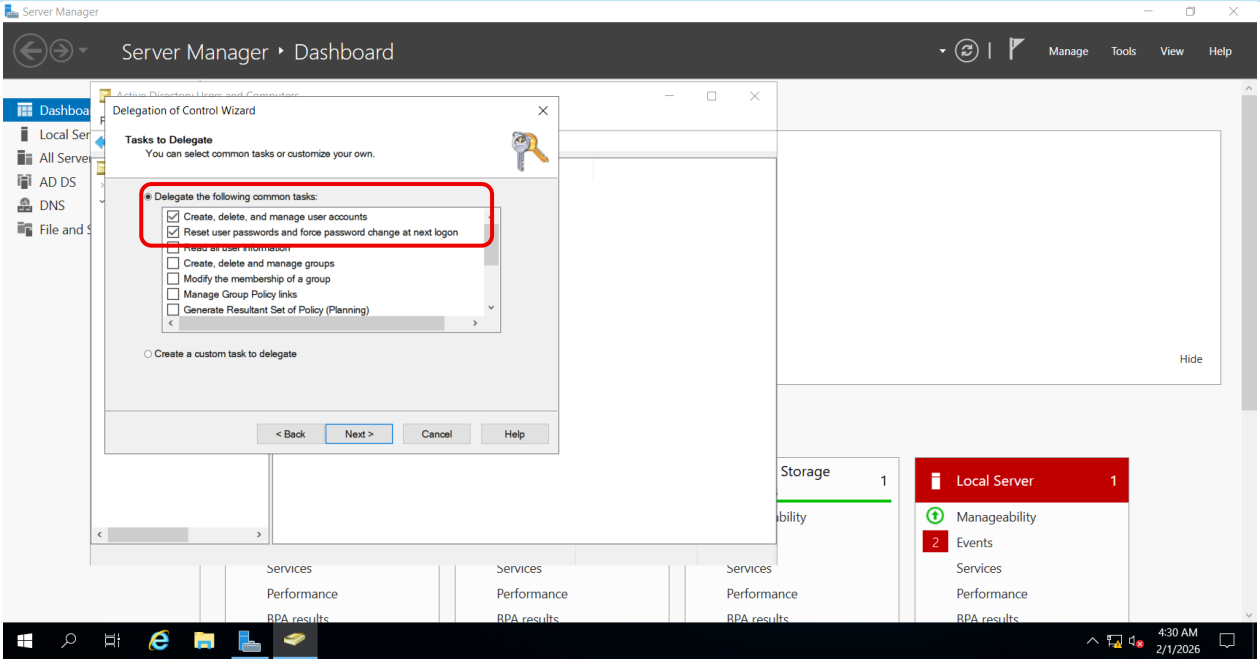
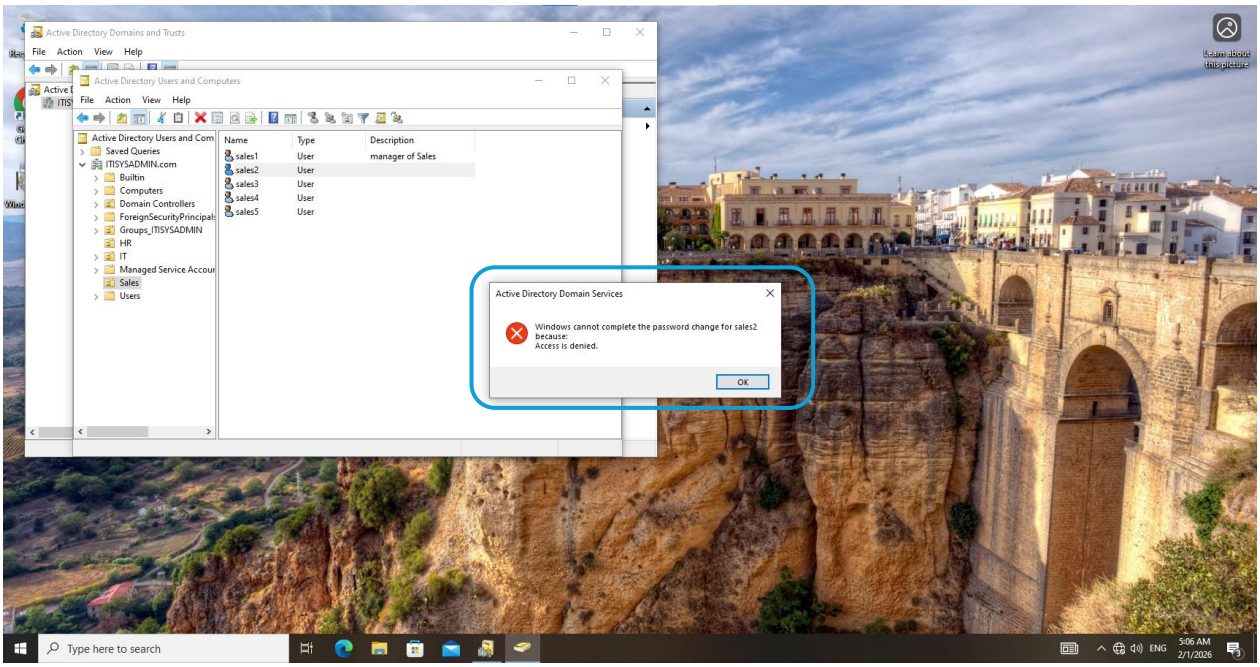
Computers
Domain Controllers
ForeignSecurityPrincipals
Managed Service Accoun
Users
IT
HR
Sales
Groups_ITISYSADMIN
Name
Type
Description
HR_Group
Security Group ...
IT_Group
Security Group ...
Sales_Group
Security Group ...
Sales_Group Properties
General
Members
Member Of
Managed By
Members:
Name
Active Directory Domain Services Folder
sales1
ITISYSADMIN.com/Sales
sales2
ITISYSADMIN.com/Sales
sales3
ITISYSADMIN.com/Sales
sales4
ITISYSADMIN.com/Sales
sales5
ITISYSADMIN.com/Sales
Add...
Remove
OK
Cancel
Apply
TASKS
Server Name
ID
Severity
Source
Log
Date and Time
PDC
1014
Warning
Microsoft-Windows-DNS Client Events
System
1/31/2026 3:53:49 PM
4:30 PM
1/31/2026

Manager of every Department must can rest pass and create, manage users on this department.

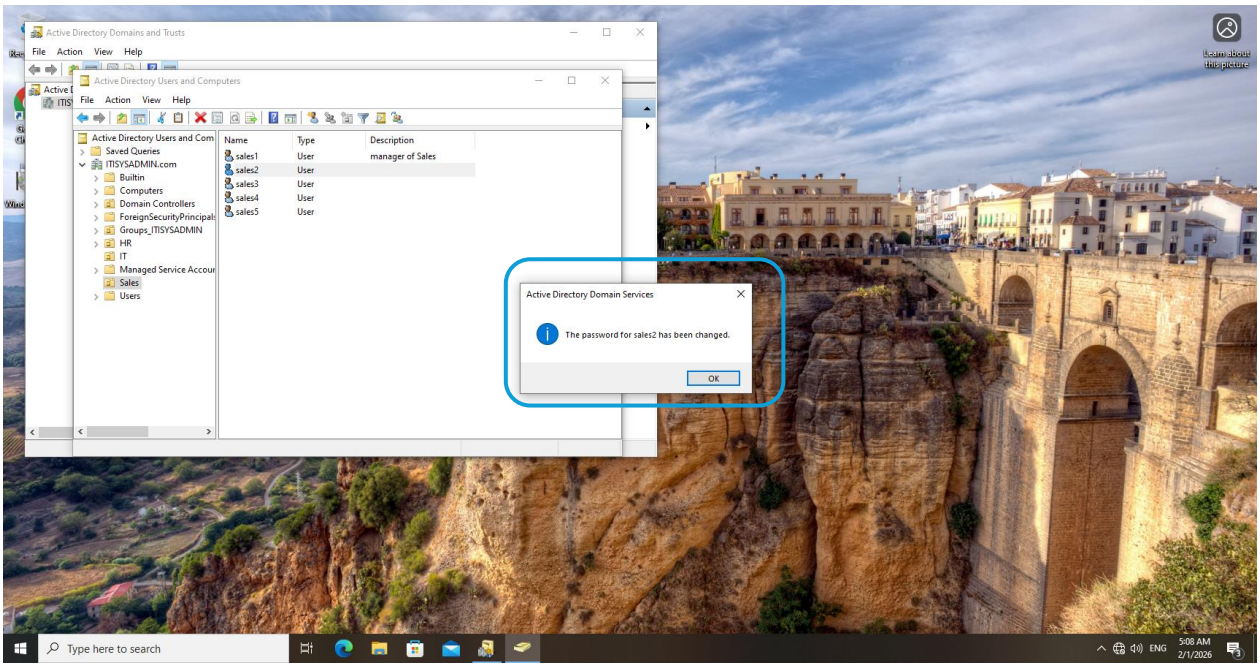
Delegation on accounts (IT1, HR1, Sales1)



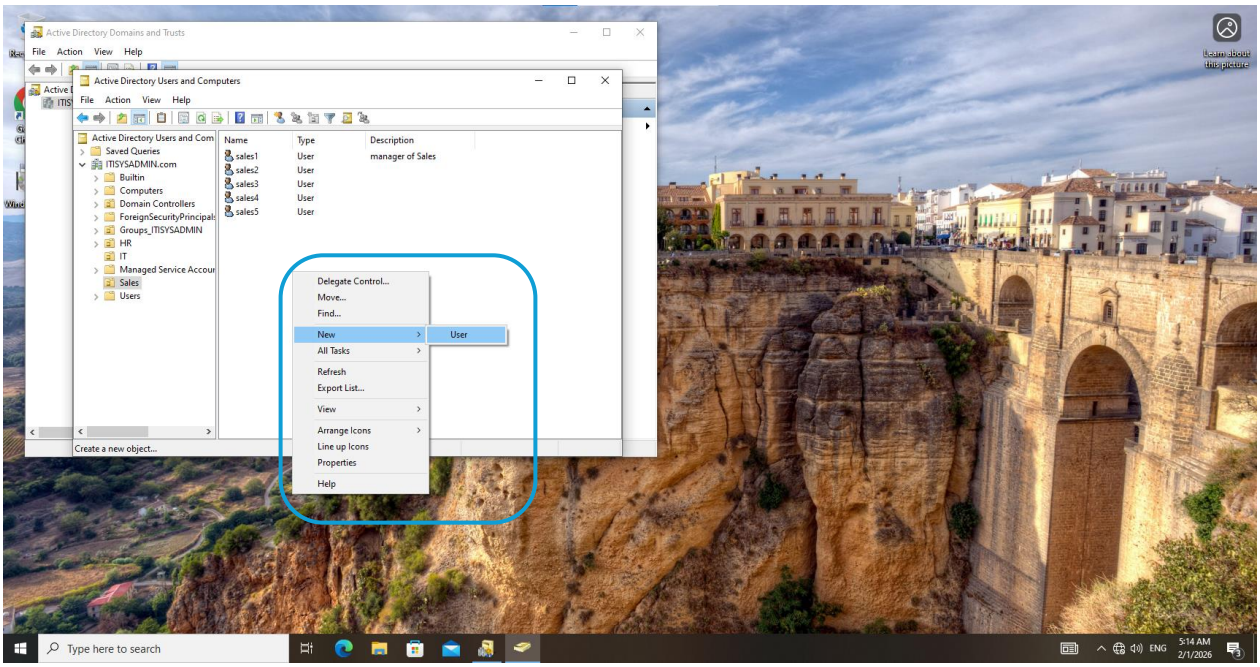
Before Delegation



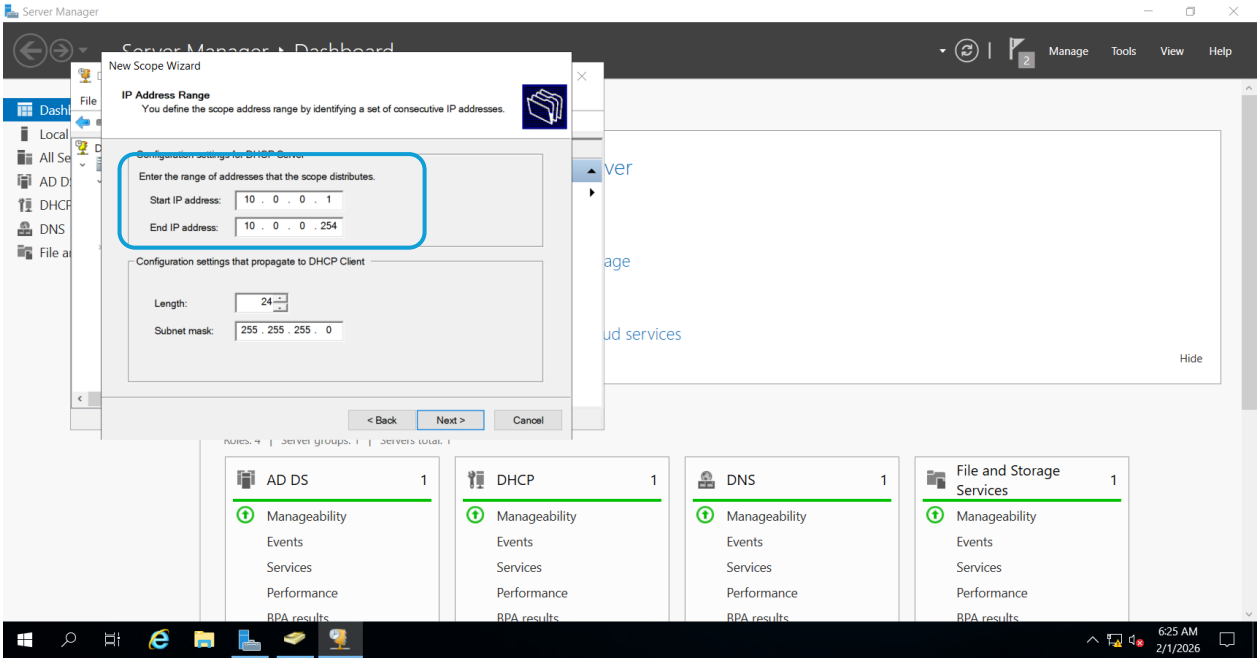
After Delegation



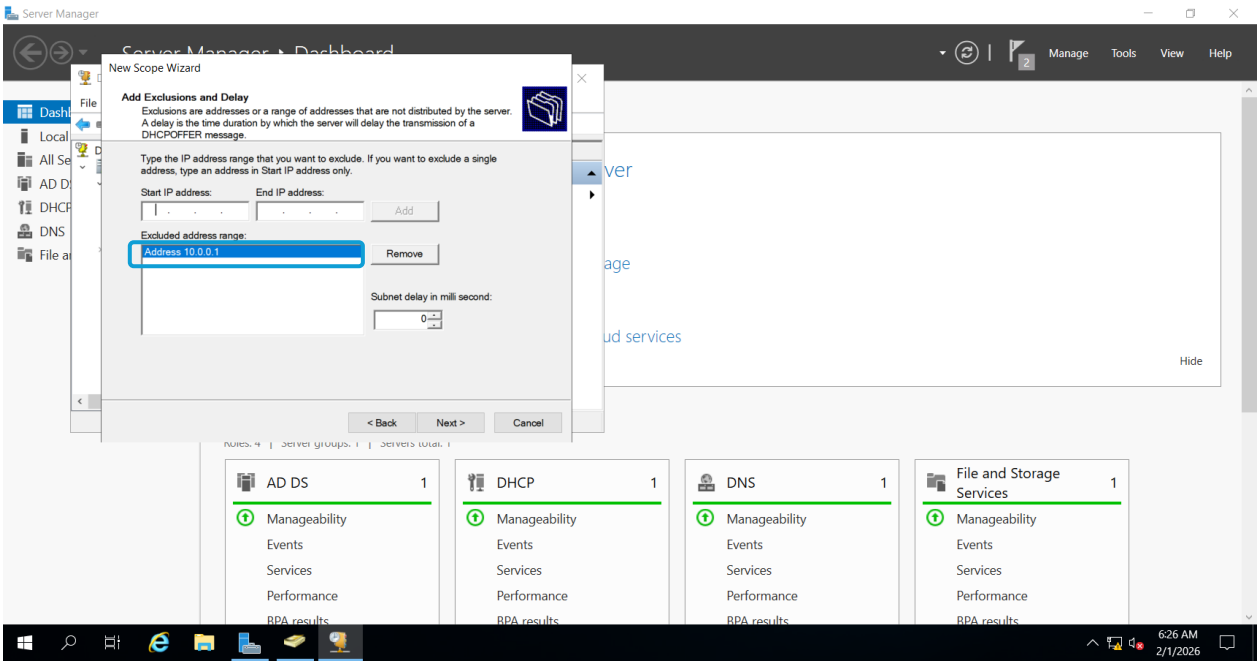
Also can create users



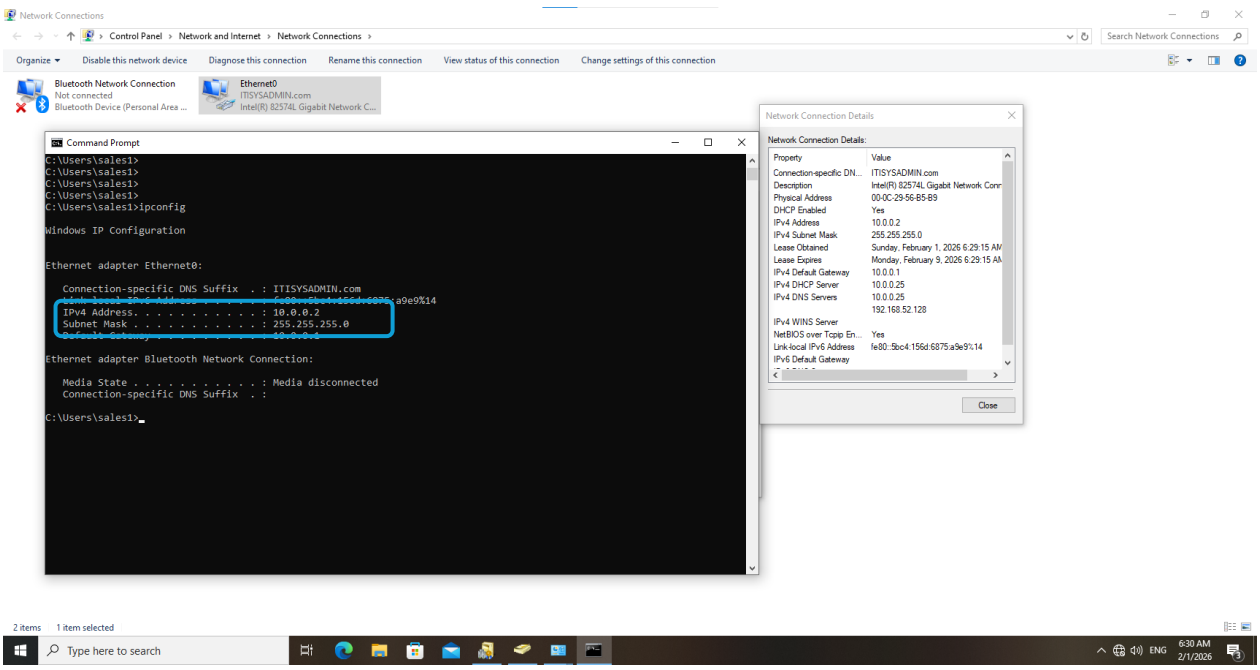
Make DHCP to distribute TCP/IP properties: 10.0.0.0/24



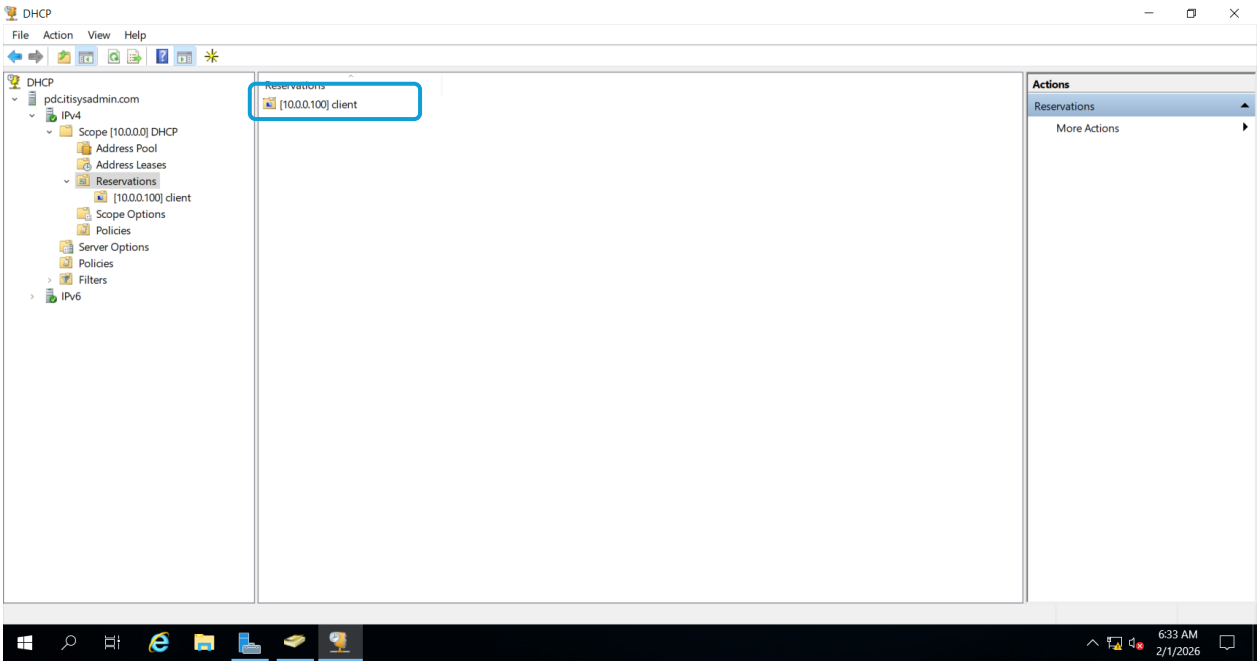
Excluded range ((10.0.0.1))



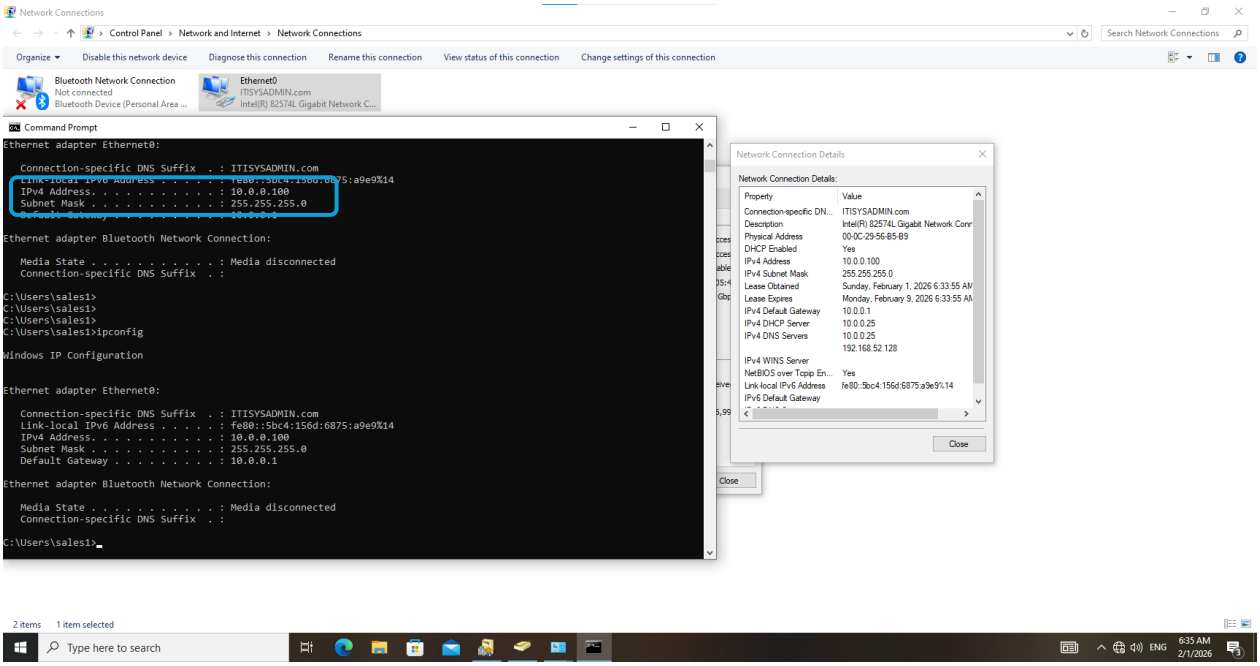
Test on client



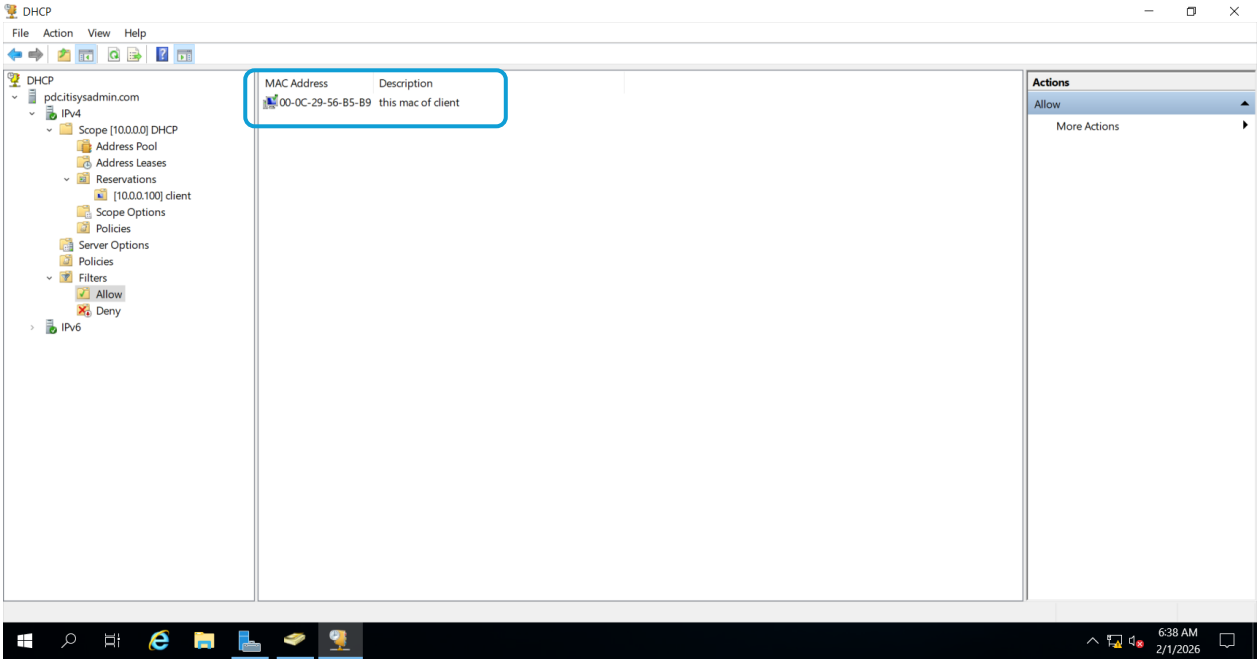
Reservation range ((10.0.0.100 to any mac))



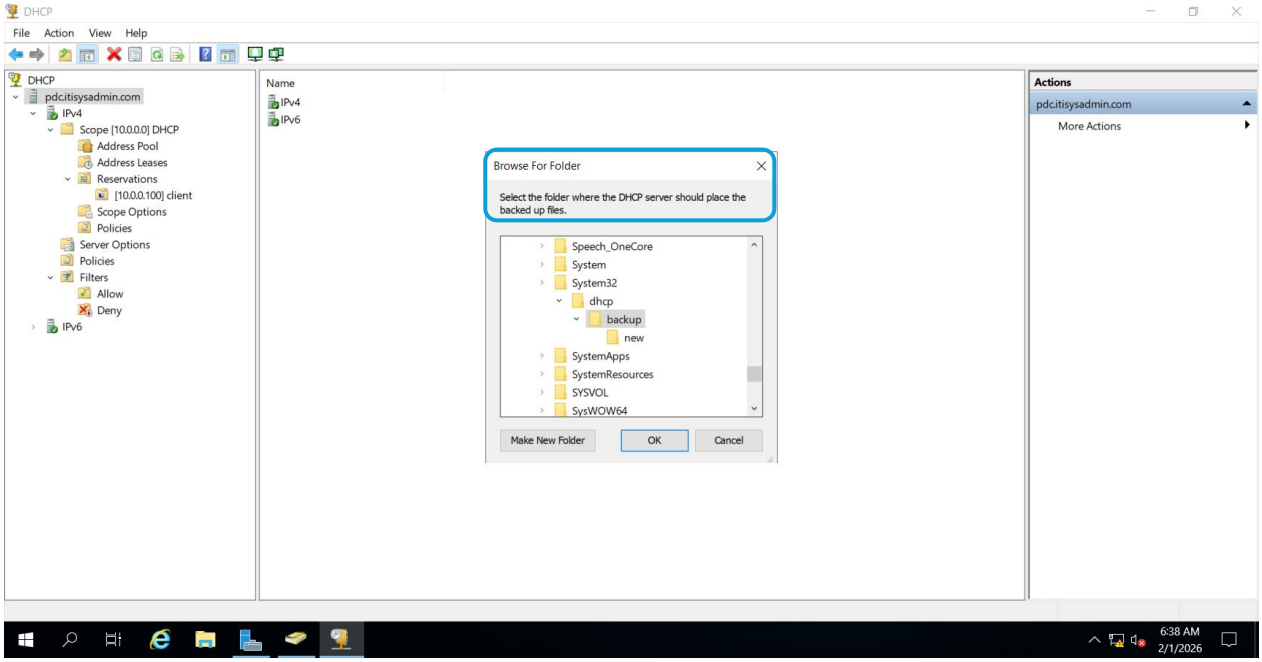
Test



Filter by mac added addresses you know and prevent others mac address.

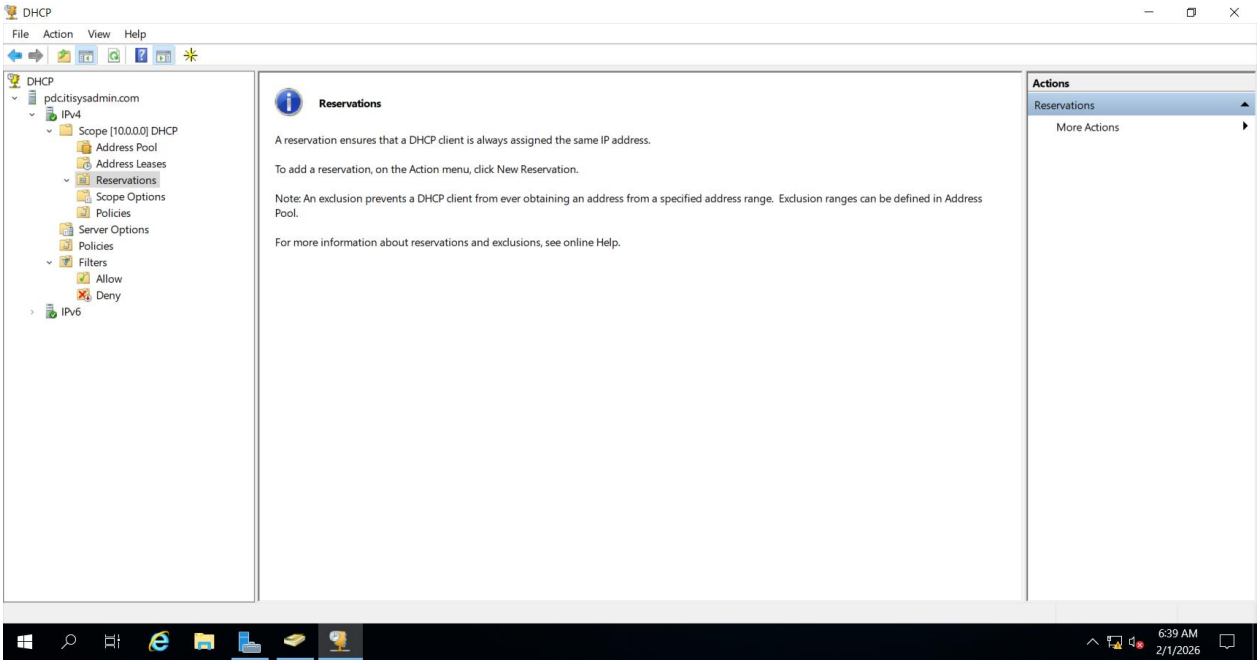


Backup configuration.

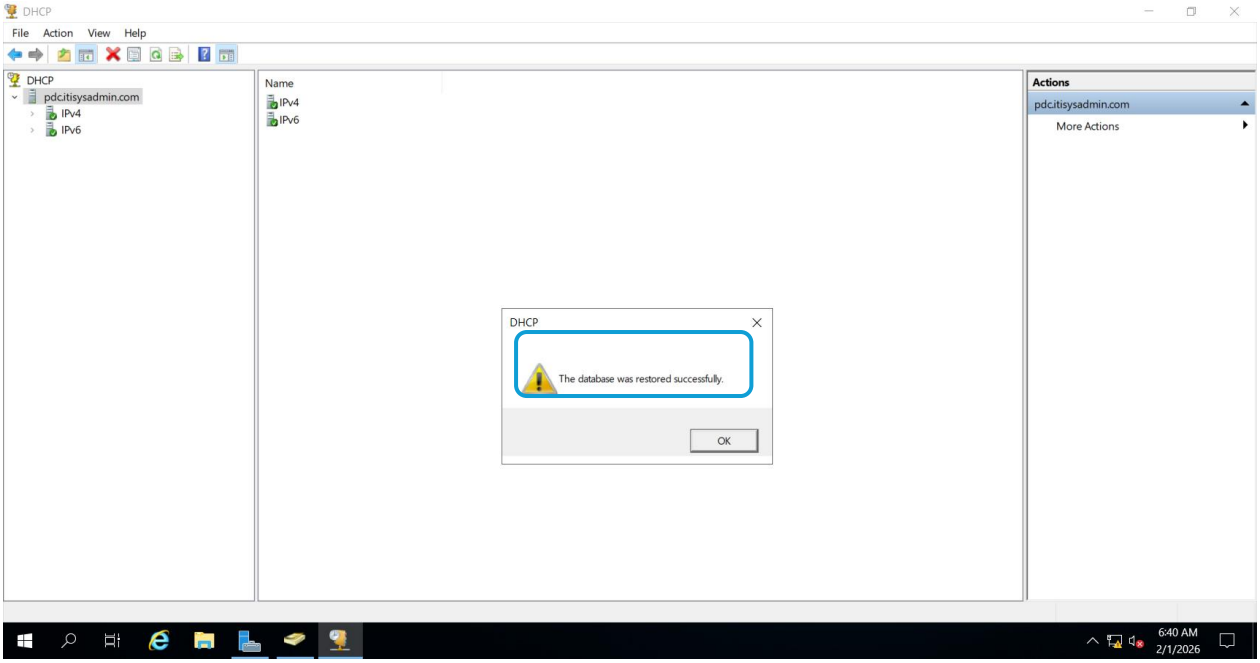


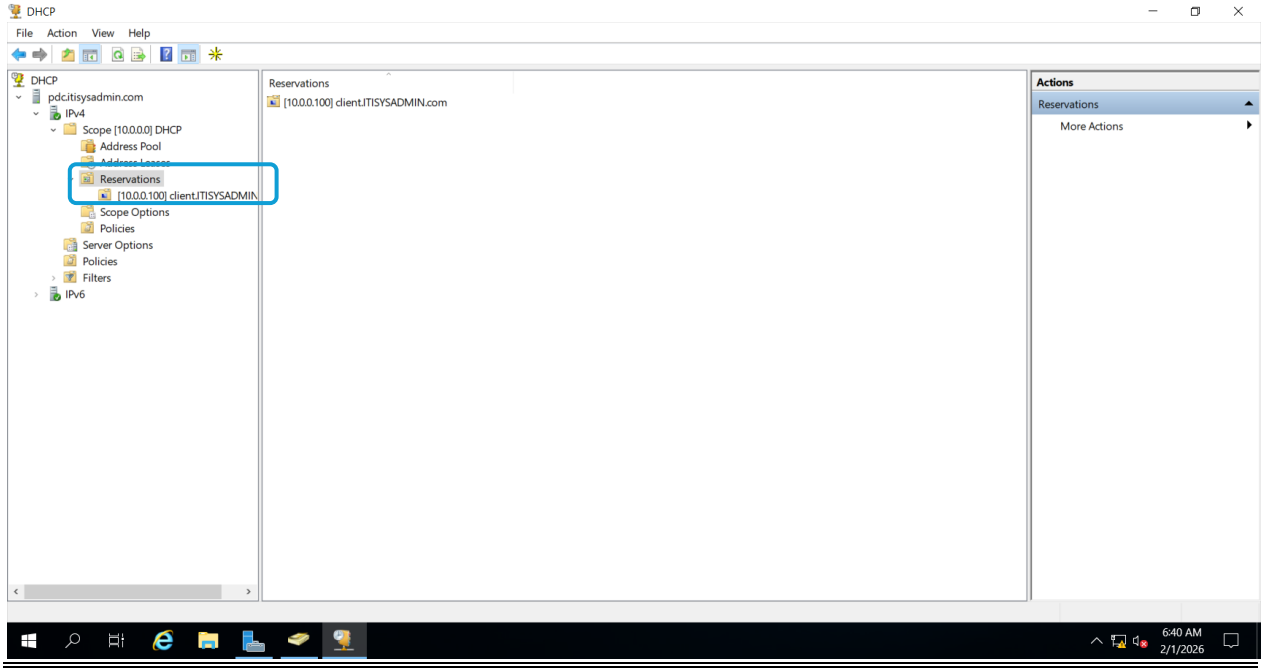
Test

After deleting the reservation

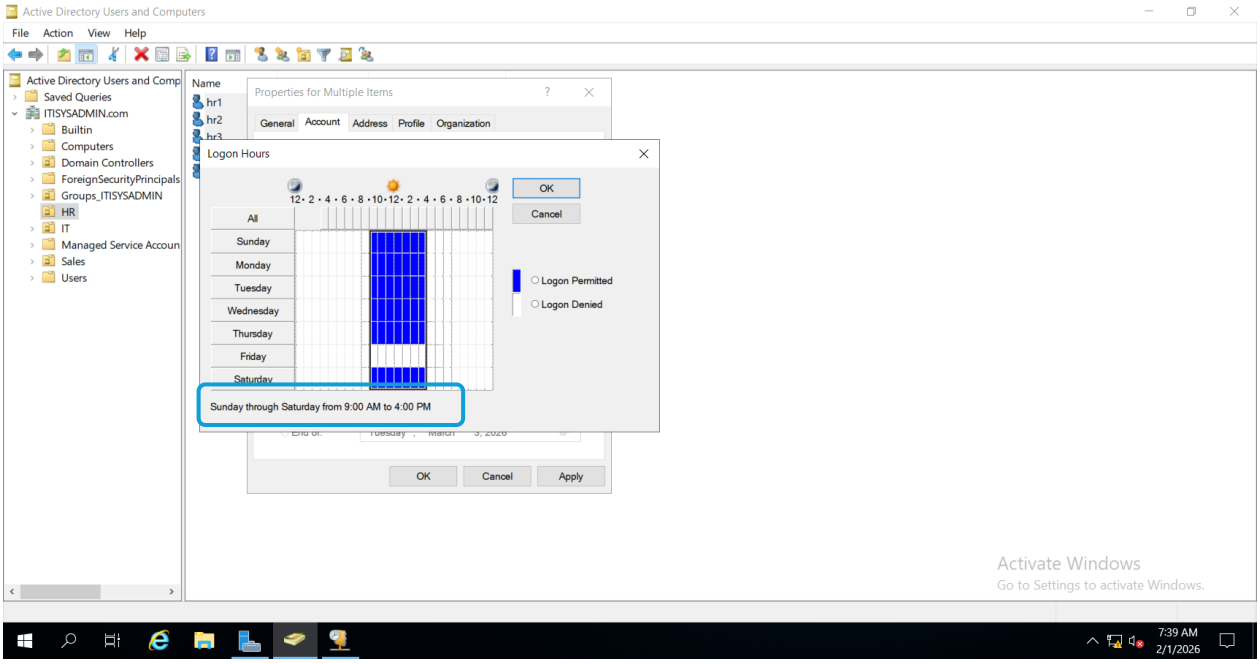


Restore backup

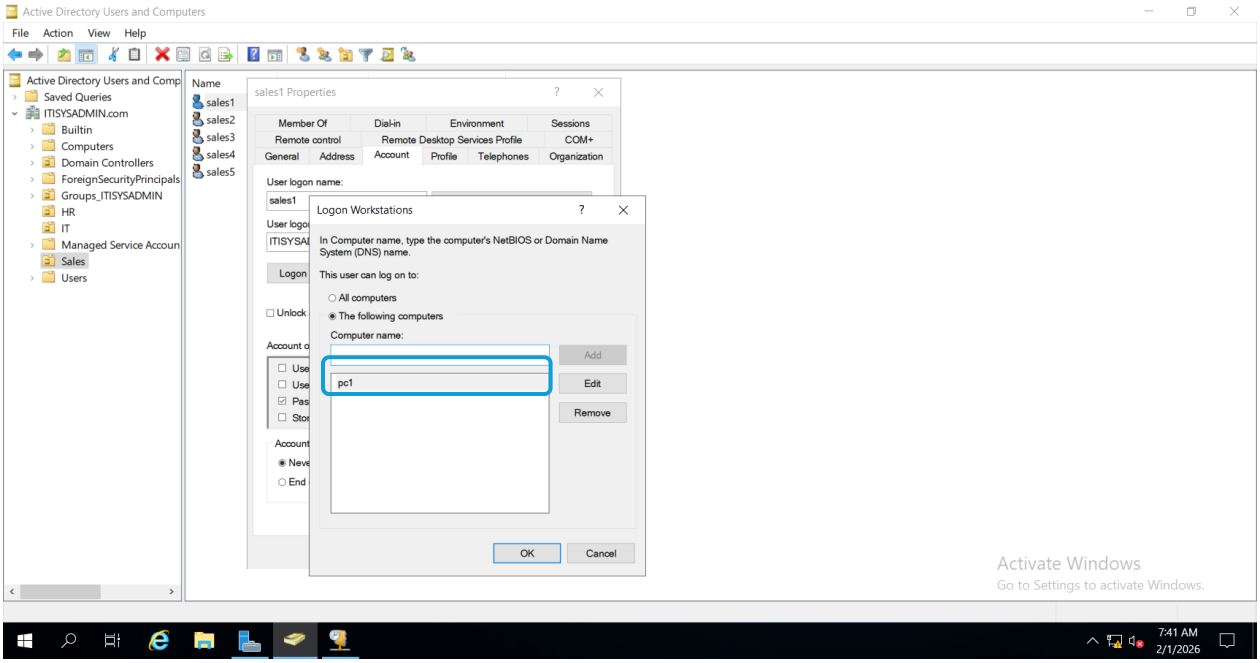


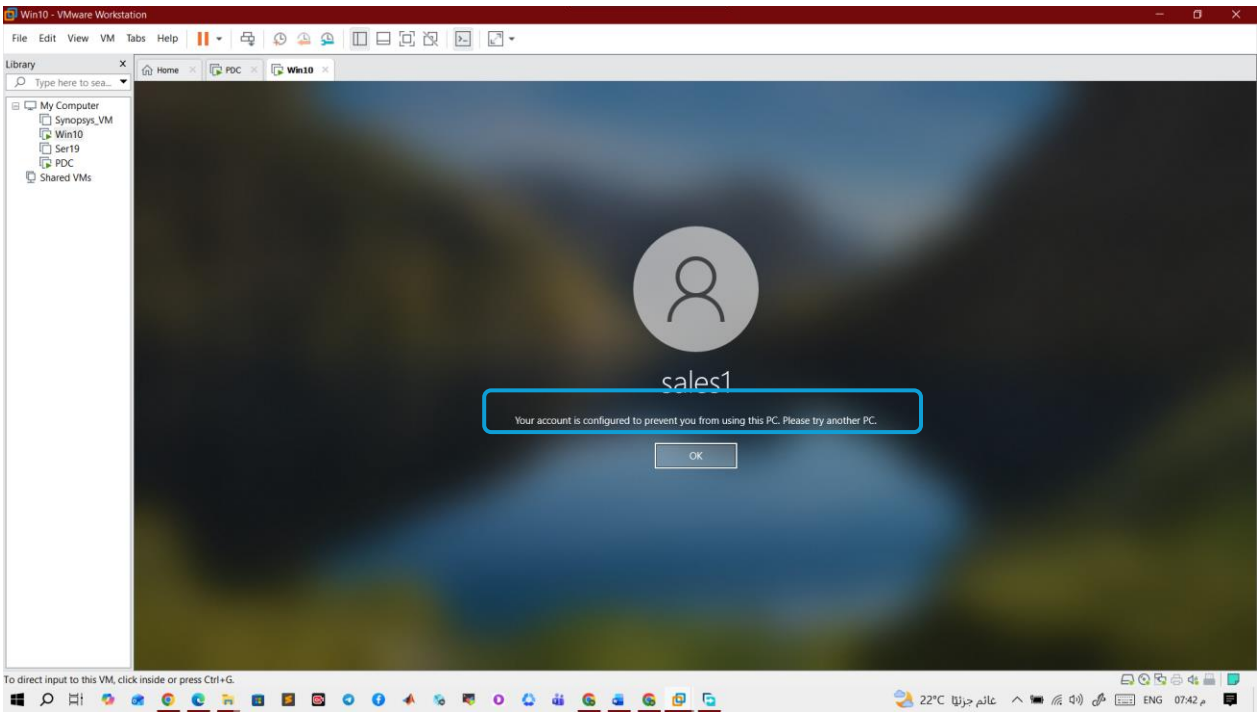


Make time logon hour to your clients suitable with work hours and every user can log from his Computer only. ((Saturday to Thursday 9 am to 4pm))

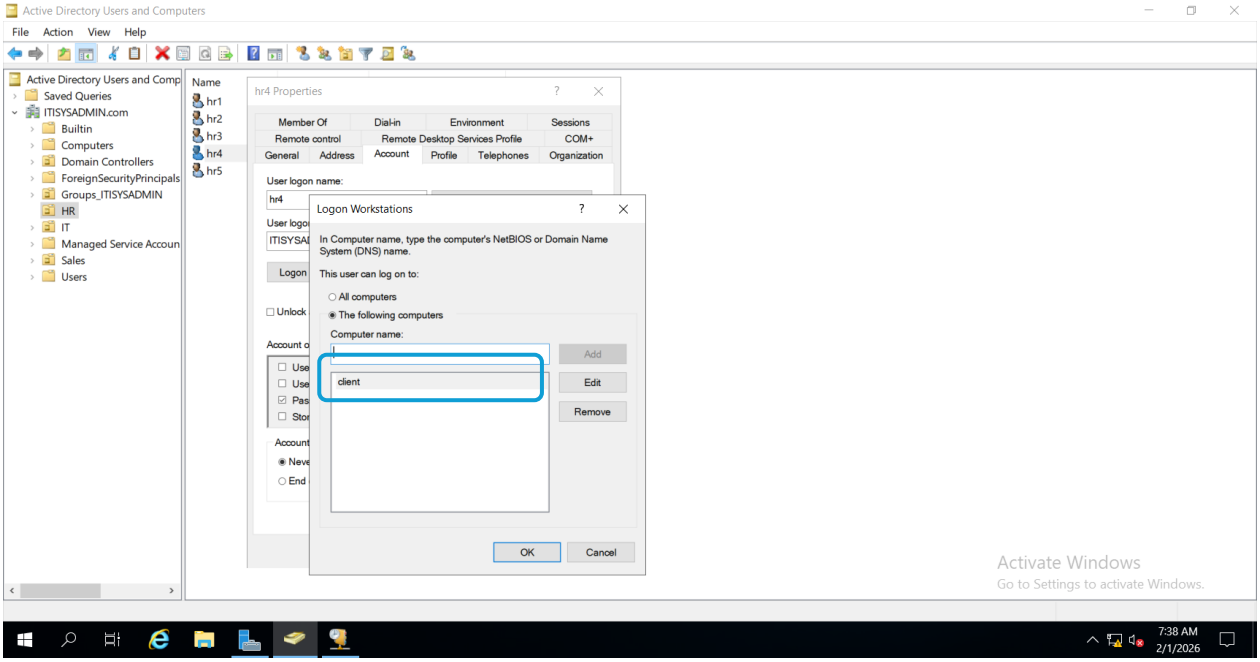


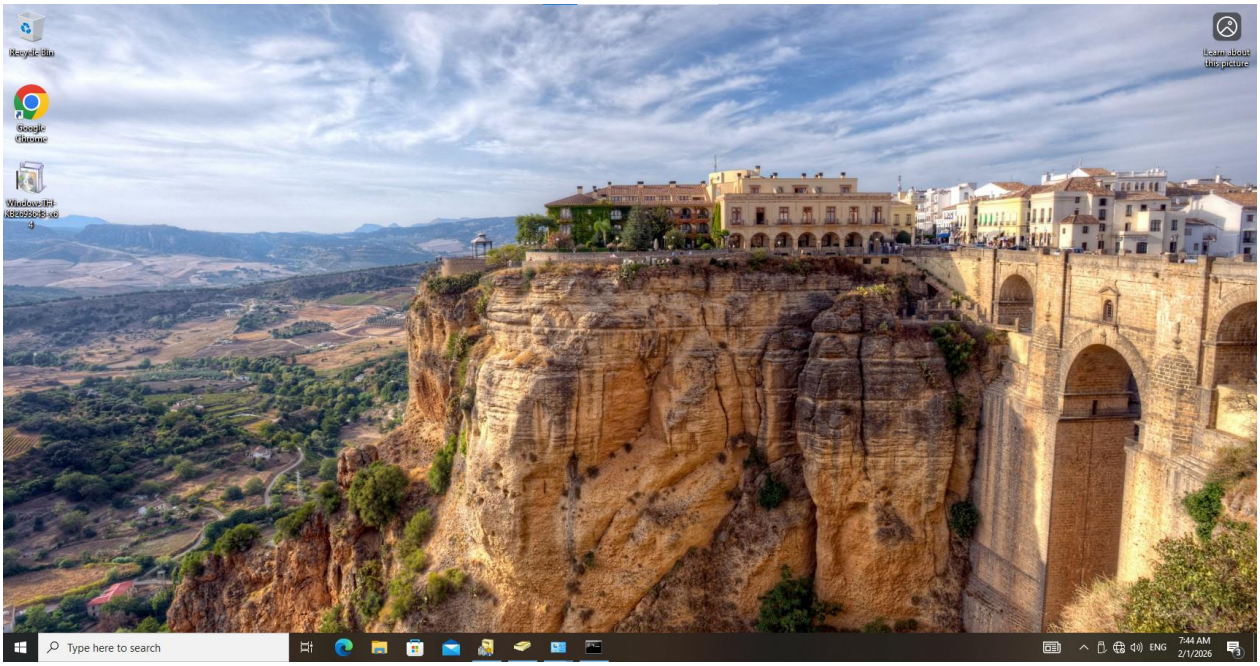
If make device name pc1(not the same name of w10)





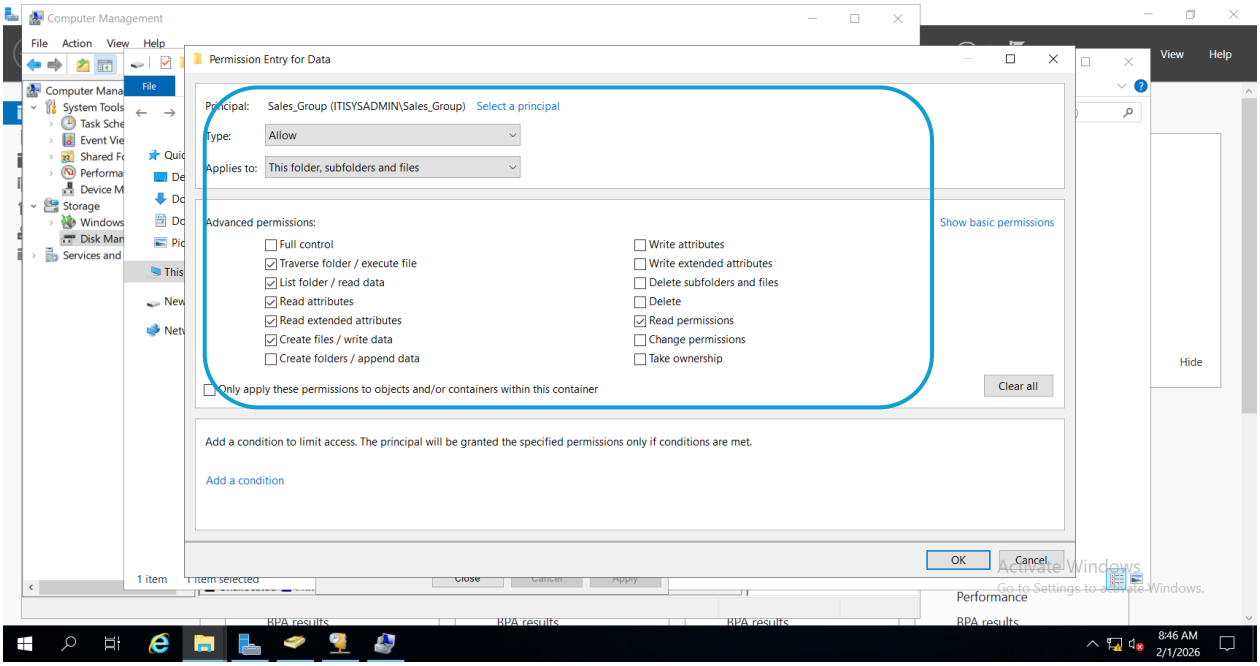
After modifying by correct name





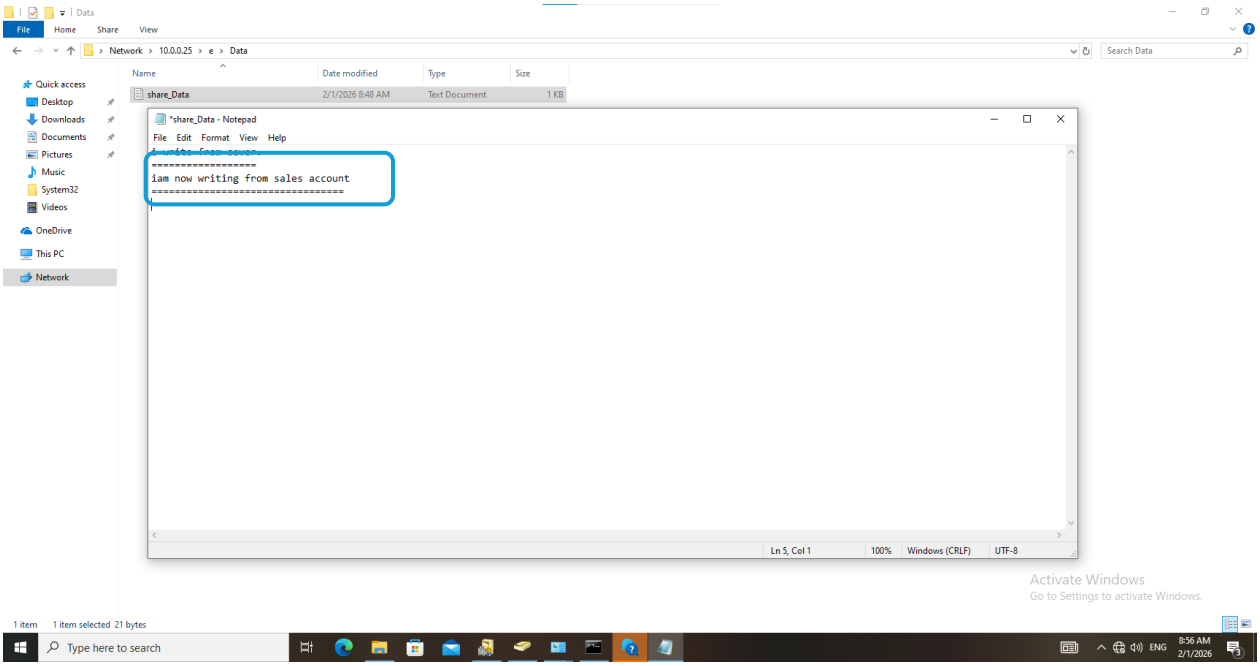
Make folder on your server (on E: drive) sharing data on your network with permission Read for HR, change for Sales and Full control to IT.

Sales

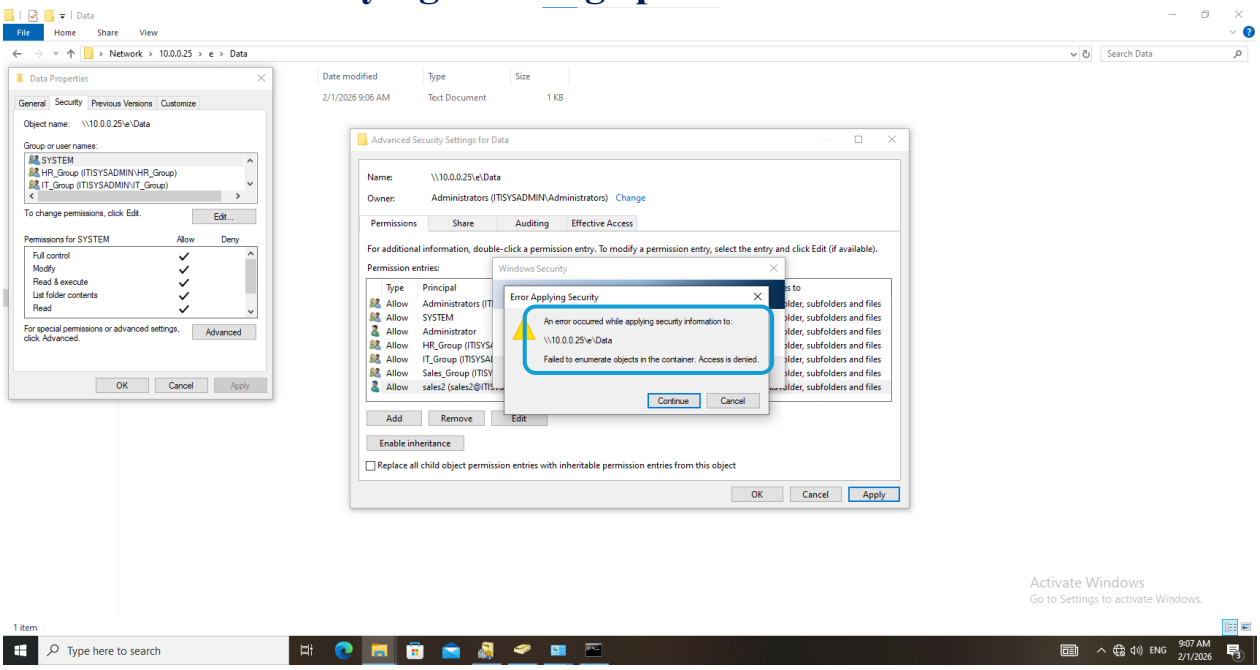


Test

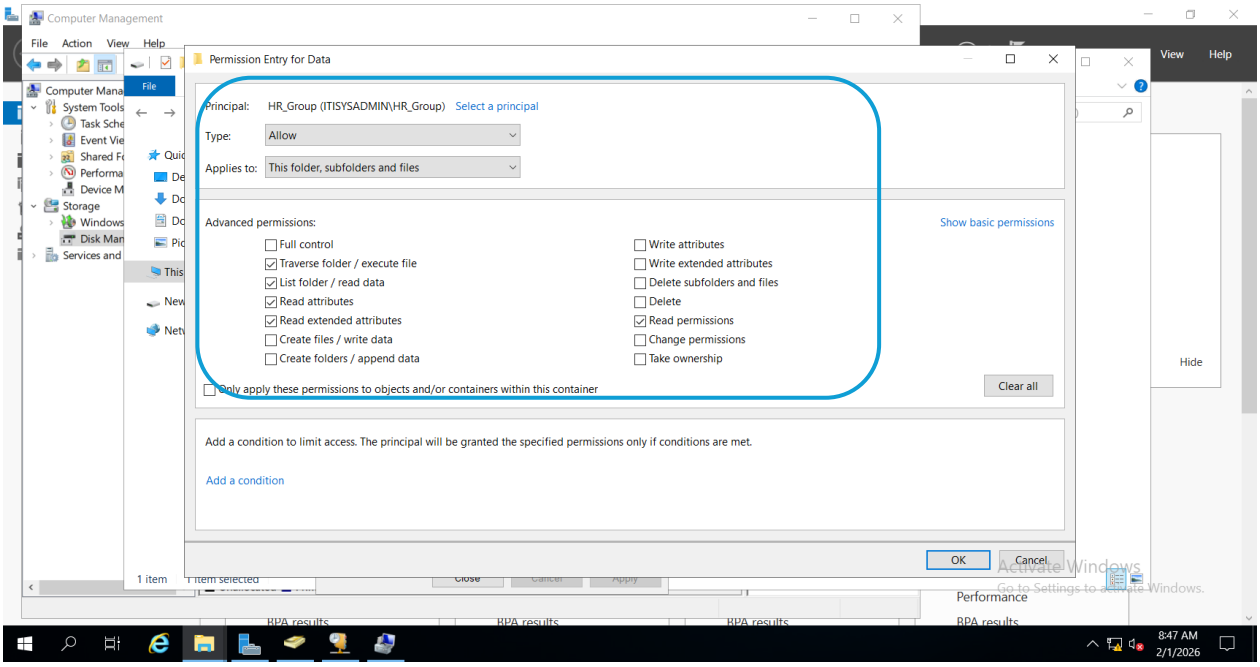
Can read and write and save files



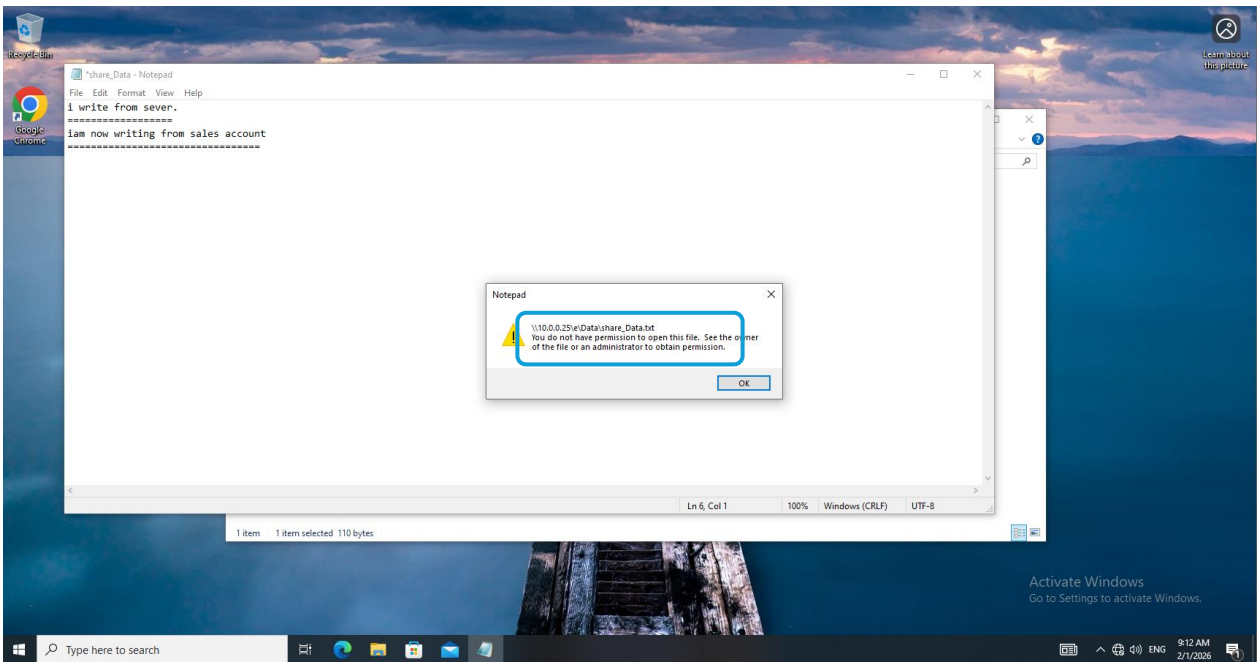
When trying to change permission of one user



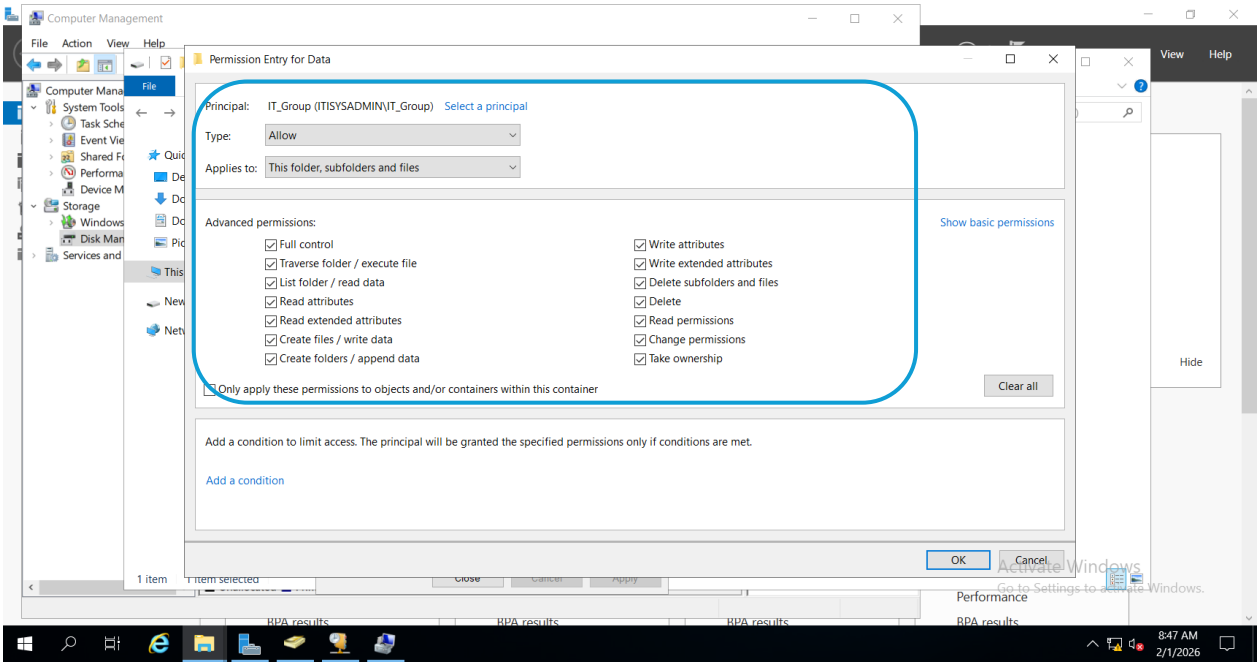
HR


Computer Management
File Action View Help
Permission Entry for Data
Principal: HR_Group (ITISYSADMIN\HR_Group) Select a principal
Type: Allow
Applies to: This folder, subfolders and files
Advanced permissions:
Show basic permissions
Full control
Traverse folder / execute file
List folder / read data
Read attributes
Read extended attributes
Create files / write data
Create folders / append data
Write attributes
Write extended attributes
Delete subfolders and files
Delete
Read permissions
Change permissions
Take ownership
Only apply these permissions to objects and/or containers within this container
Clear all
Add a condition to limit access. The principal will be granted the specified permissions only if conditions are met.
Add a condition
OK
Cancel
Activate Windows
Go to Settings to activate Windows.
8:47 AM
2/1/2026

Test

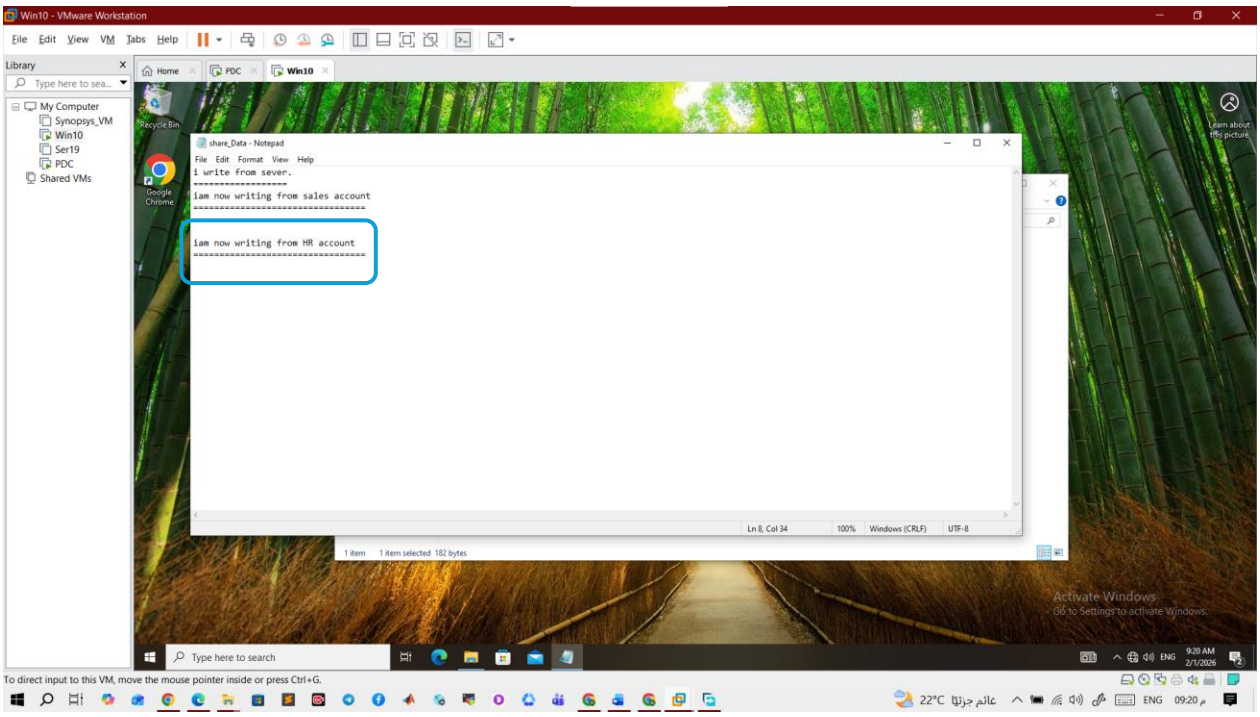

*share_Data - Notepad
File Edit Format View Help
i write from sever.
==========
iam now writing from sales account
==========
Notepad
\\10.0.0.25\e\Data\share_Data.txt
You do not have permission to open this file. See the owner of the file or an administrator to obtain permission.
OK
Ln 6, Col 1
100%
Windows (CRLF)
UTF-8
1 item
1 item selected 110 bytes
Activate Windows
Go to Settings to activate Windows.
Type here to search
9:12 AM
2/1/2026

IT



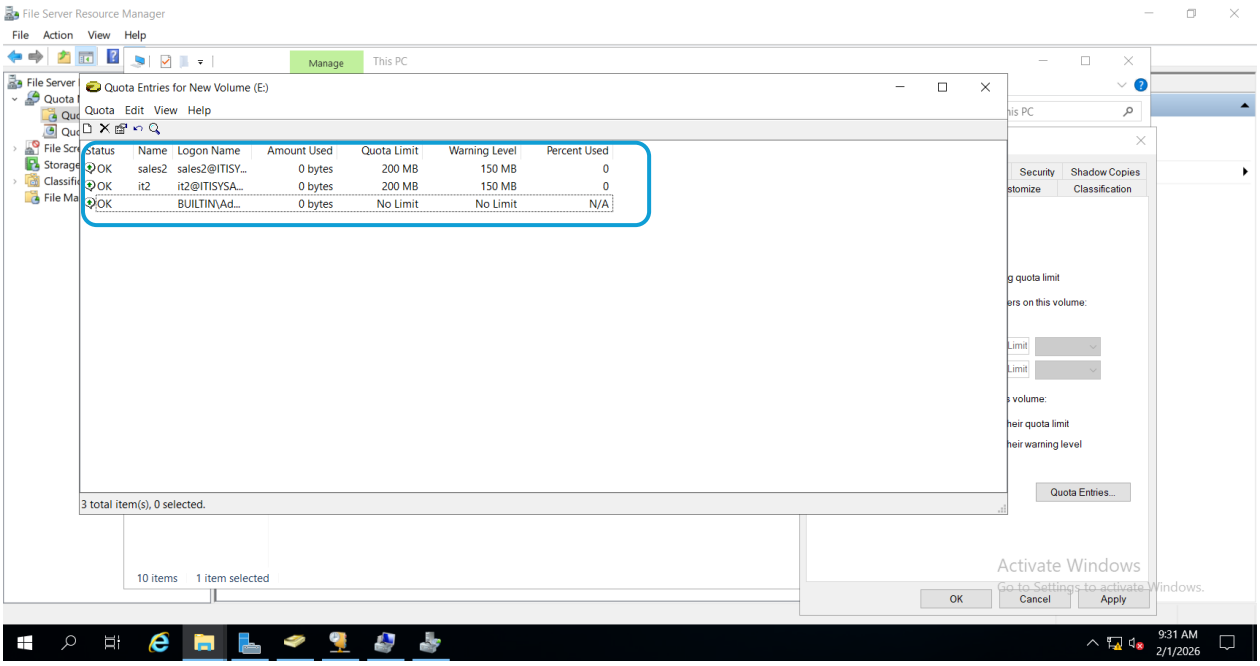
Test

Can write on file

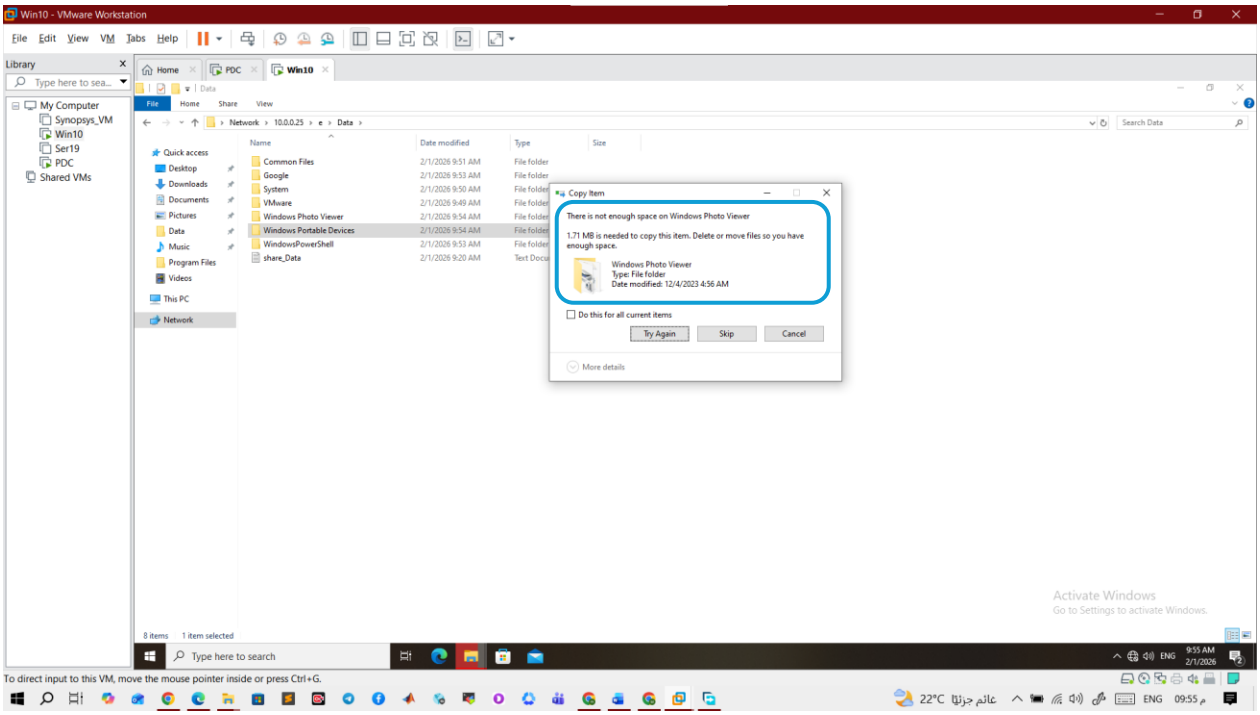


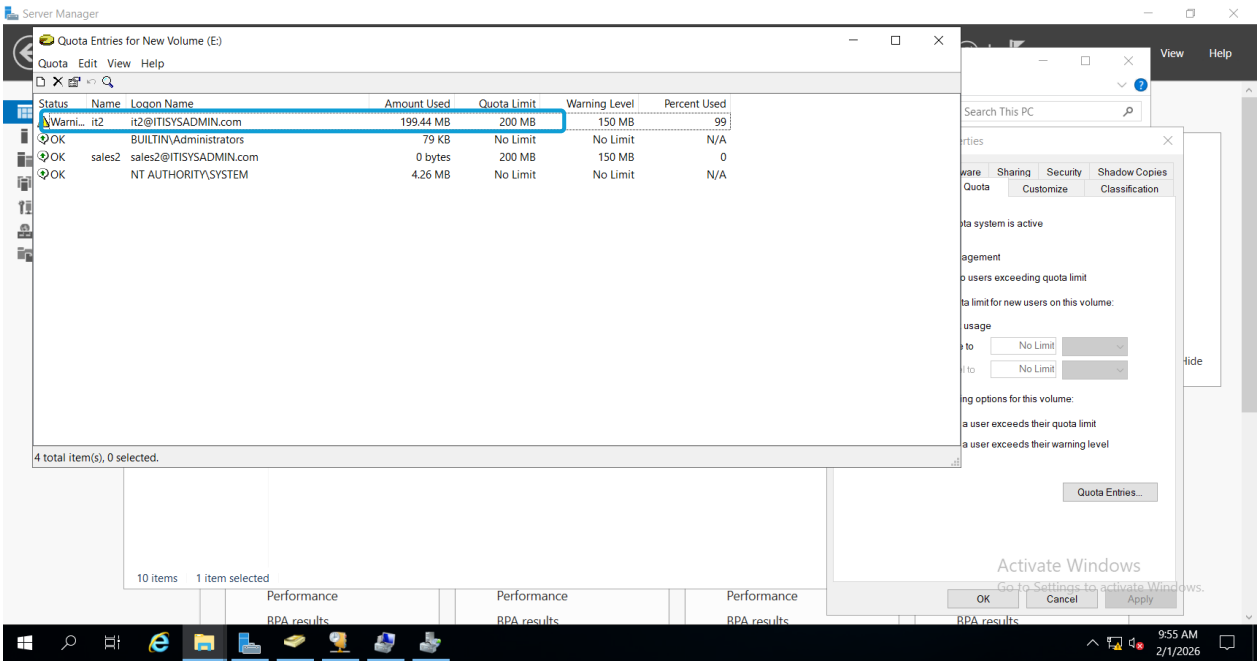
Also Can change permission

Limit size of storage on users IT2, Sales2 as 200MB not more on Folder you shared it before.

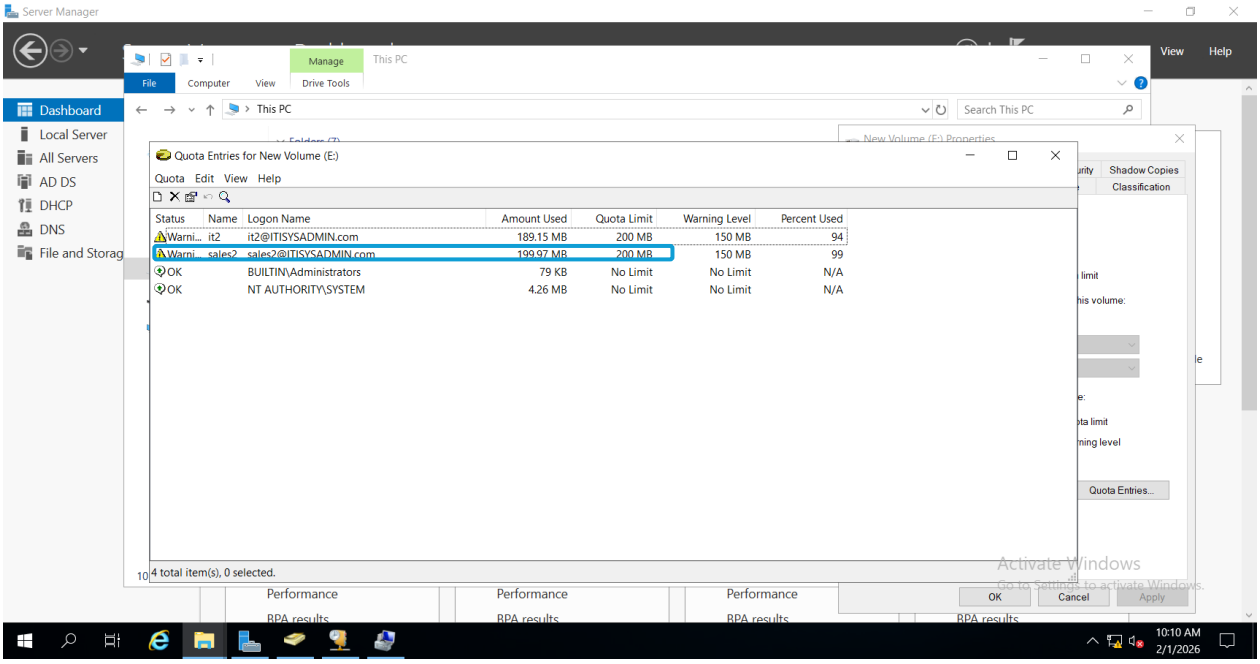


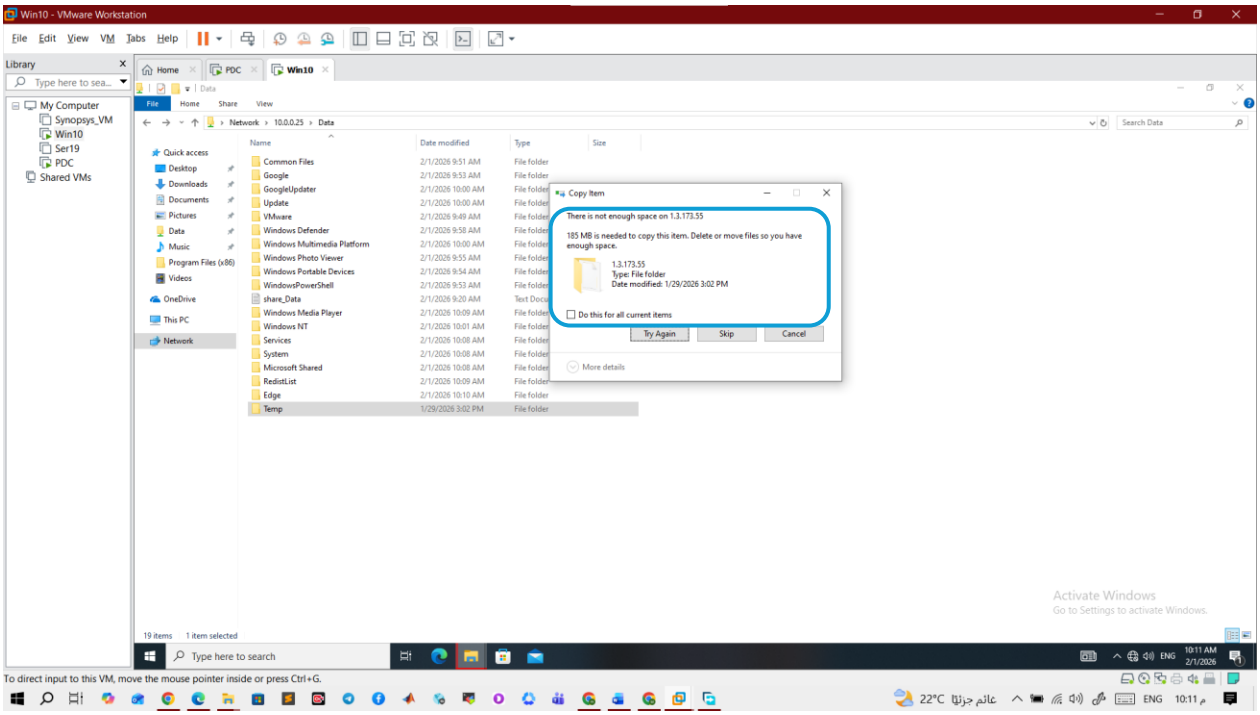
On IT2


Win10 - VMware Workstation
Copy Item
There is not enough space on Windows Photo Viewer
1.71 MB is needed to copy this item. Delete or move files so you have enough space.
Windows Photo Viewer
Type: File folder
Date modified: 12/4/2023 4:56 AM
Do this for all current items
Try Again
Skip
Cancel
More details

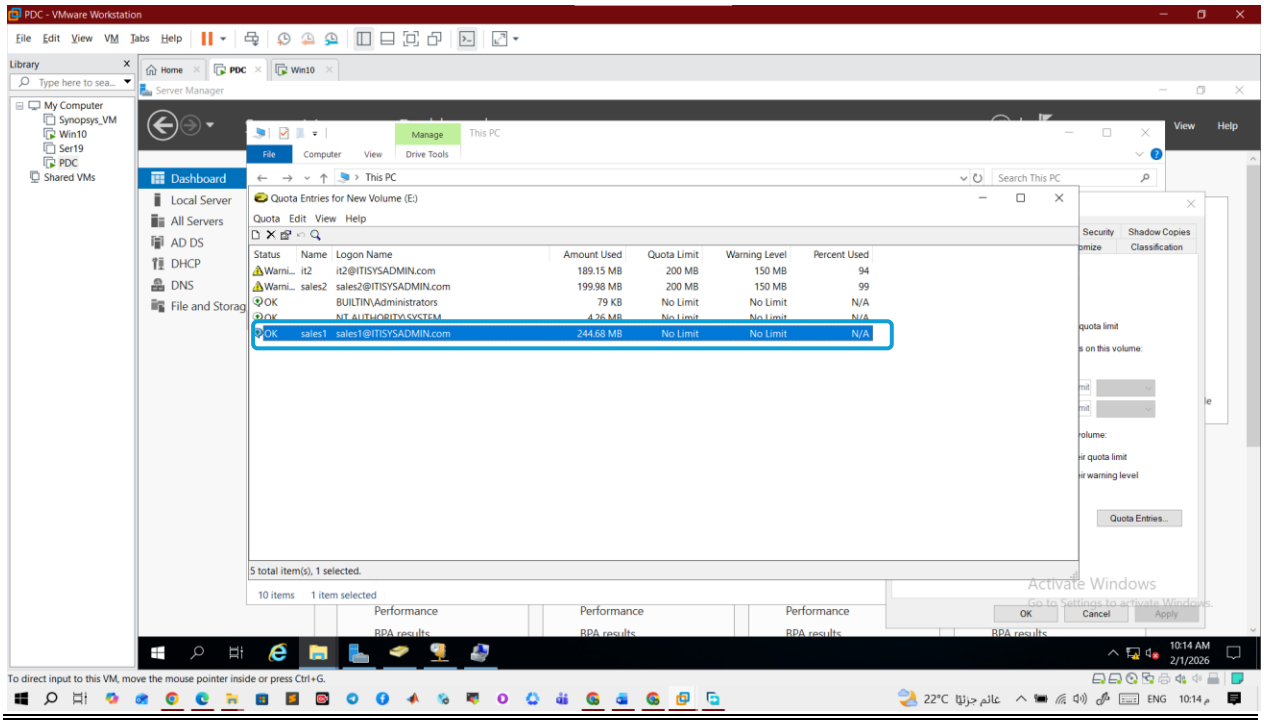

Server Manager
Quota Entries for New Volume (E:)
Quota Edit View Help
Status Name Logon Name Amount Used Quota Limit Warning Level Percent Used
Warni... it2 it2@ITISYSADMIN.com 199.44 MB 200 MB 150 MB 99
OK BUILTIN\Administrators 79 KB No Limit No Limit N/A
OK sales2 sales2@ITISYSADMIN.com 0 bytes 200 MB 150 MB 0
OK NT AUTHORITY\SYSTEM 4.26 MB No Limit No Limit N/A
4 total item(s), 0 selected.
Quota Entries...
OK
Cancel
Apply

On Sales2

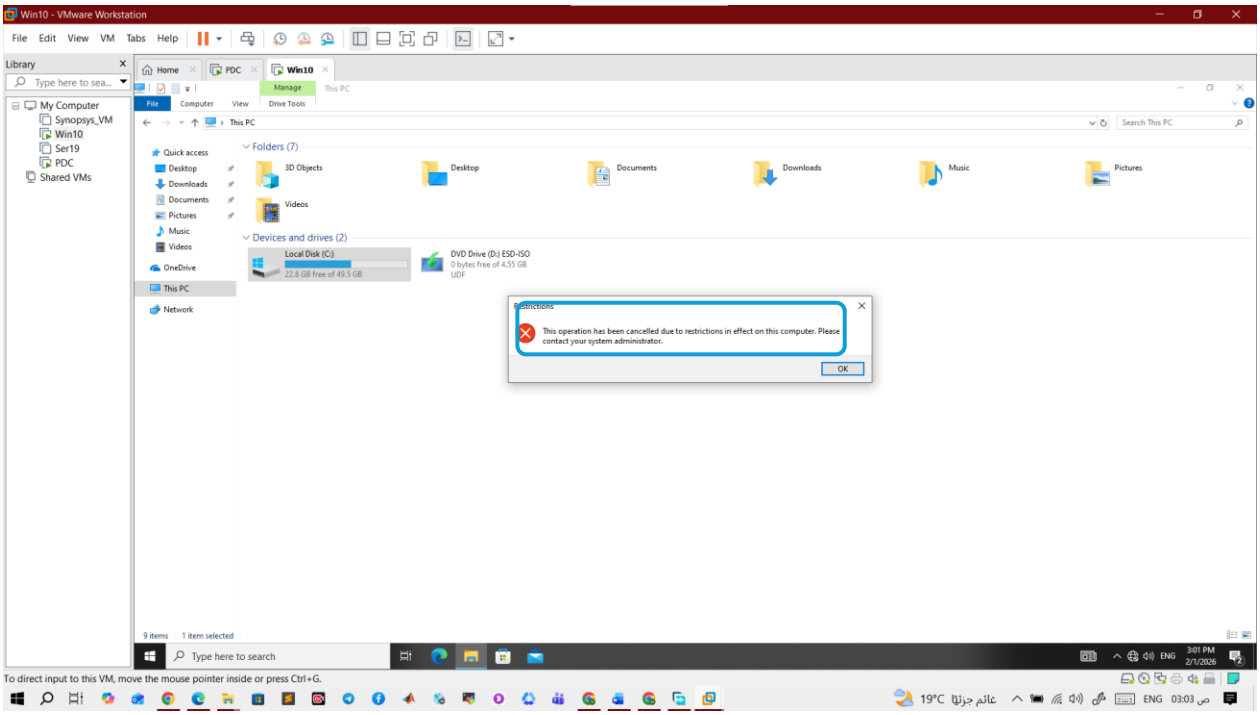

Server Manager
Dashboard
Local Server
All Servers
AD DS
DHCP
DNS
File and Storag
This PC
Quota Entries for New Volume (E:)
Quota Edit View Help
Status Name Logon Name Amount Used Quota Limit Warning Level Percent Used
Warni... it2 it2@ITISYSADMIN.com 189.15 MB 200 MB 150 MB 94
Warni... sales2 sales2@ITISYSADMIN.com 199.97 MB 200 MB 150 MB 99
OK BUILTIN\Administrators 79 KB No Limit No Limit N/A
OK NT AUTHORITY\SYSTEM 4.26 MB No Limit No Limit N/A
4 total item(s), 0 selected.
Quota Entries...
OK
Cancel
Apply
10:10 AM
2/1/2026


Win10 - VMware Workstation
Copy Item
There is not enough space on 1.3.173.55
185 MB is needed to copy this item. Delete or move files so you have enough space.
1.3.173.55
Type: File folder
Date modified: 1/29/2026 3:02 PM
Do this for all current items
Try Again
Skip
Cancel
More details
To direct input to this VM, move the mouse pointer inside or press Ctrl+G.

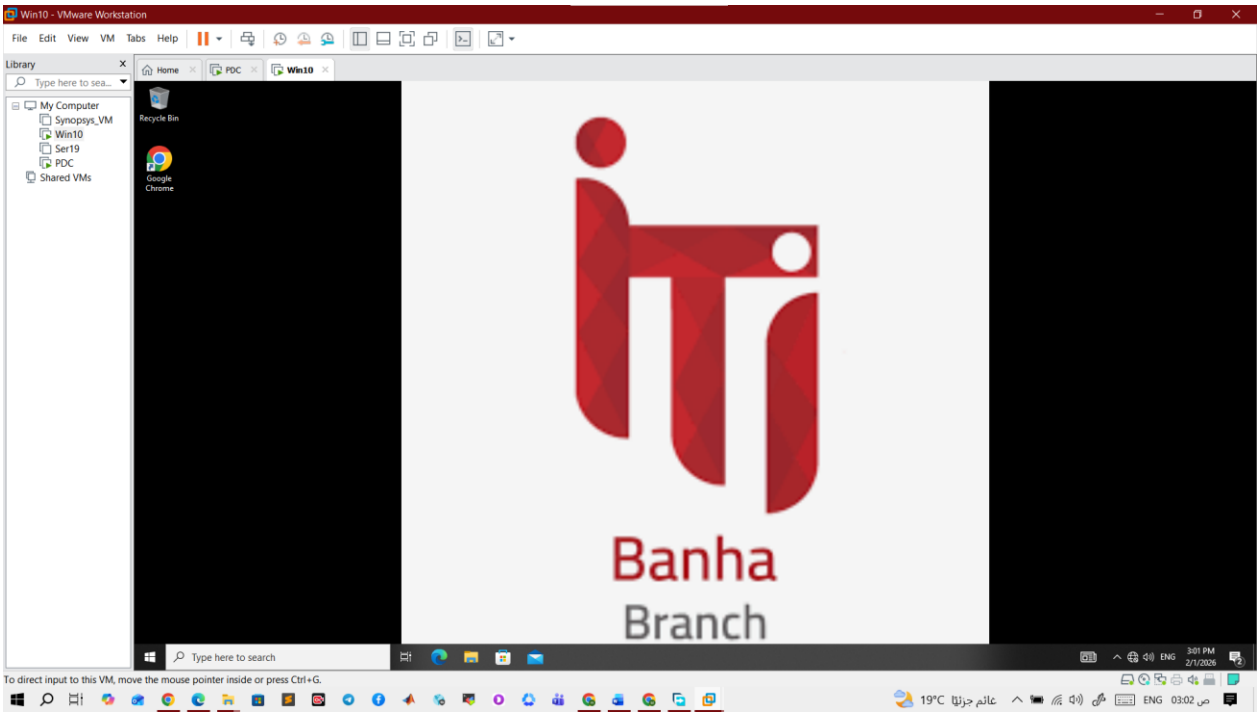
On another pc can put any size



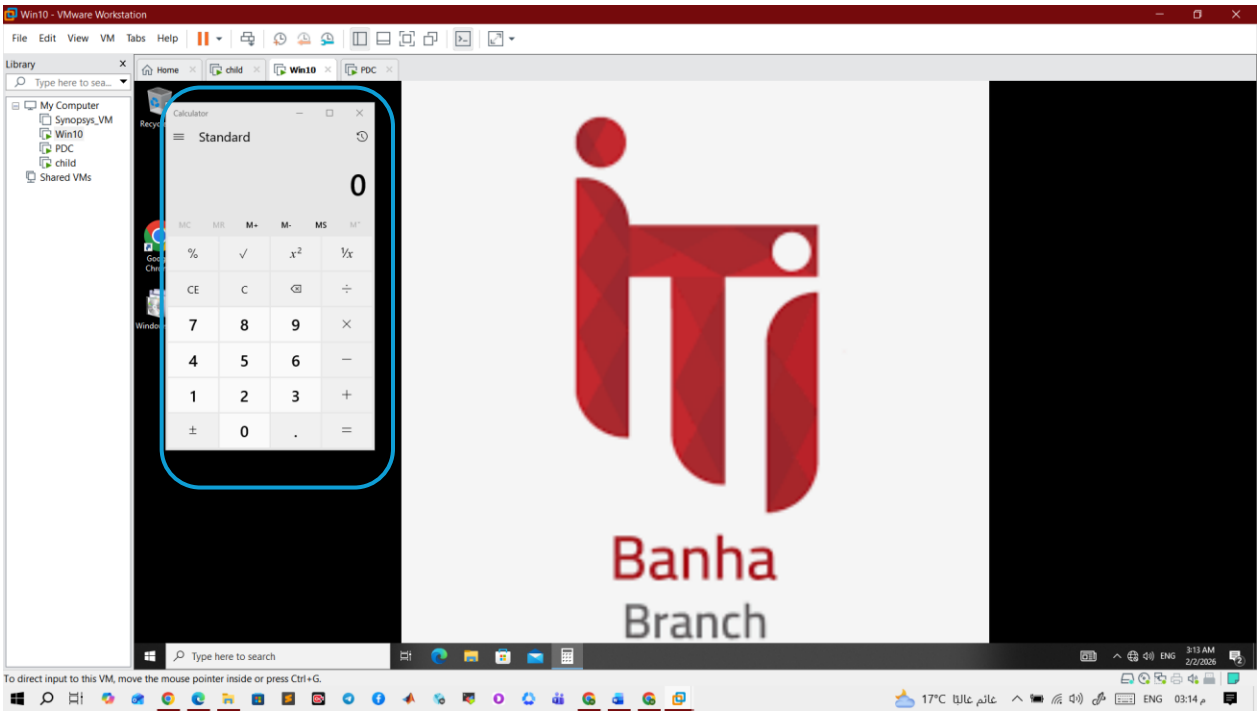
Make all users can not open drives of my computer



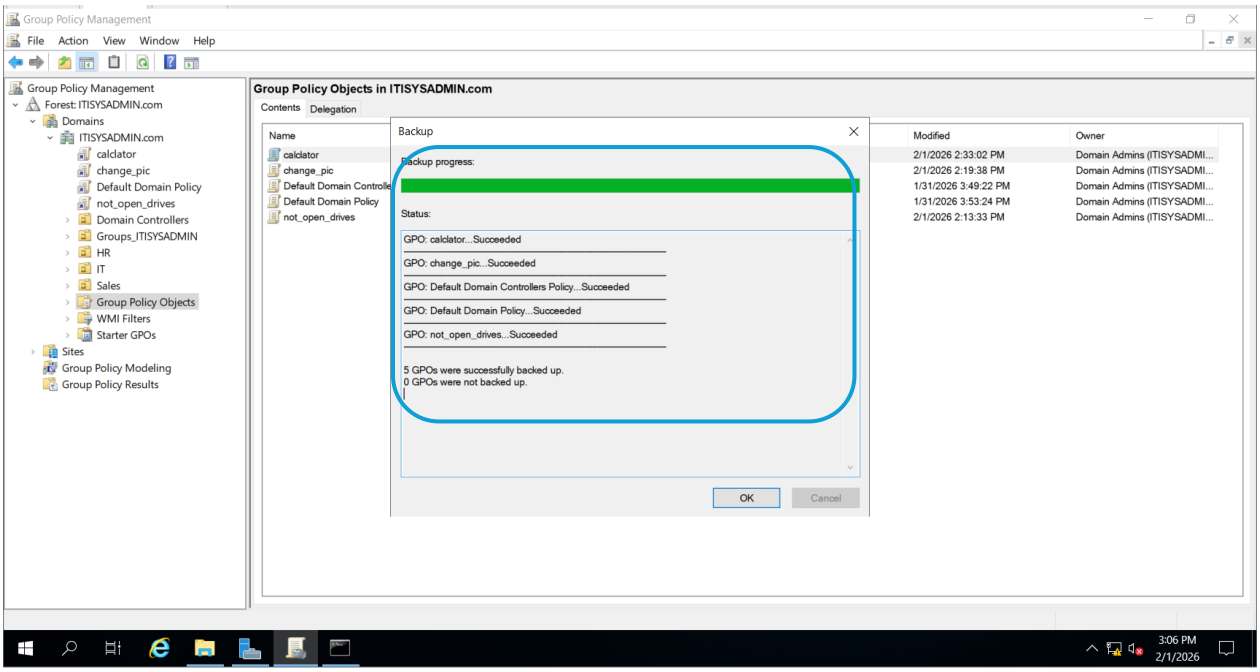
change Wallpaper to all users with any picture.



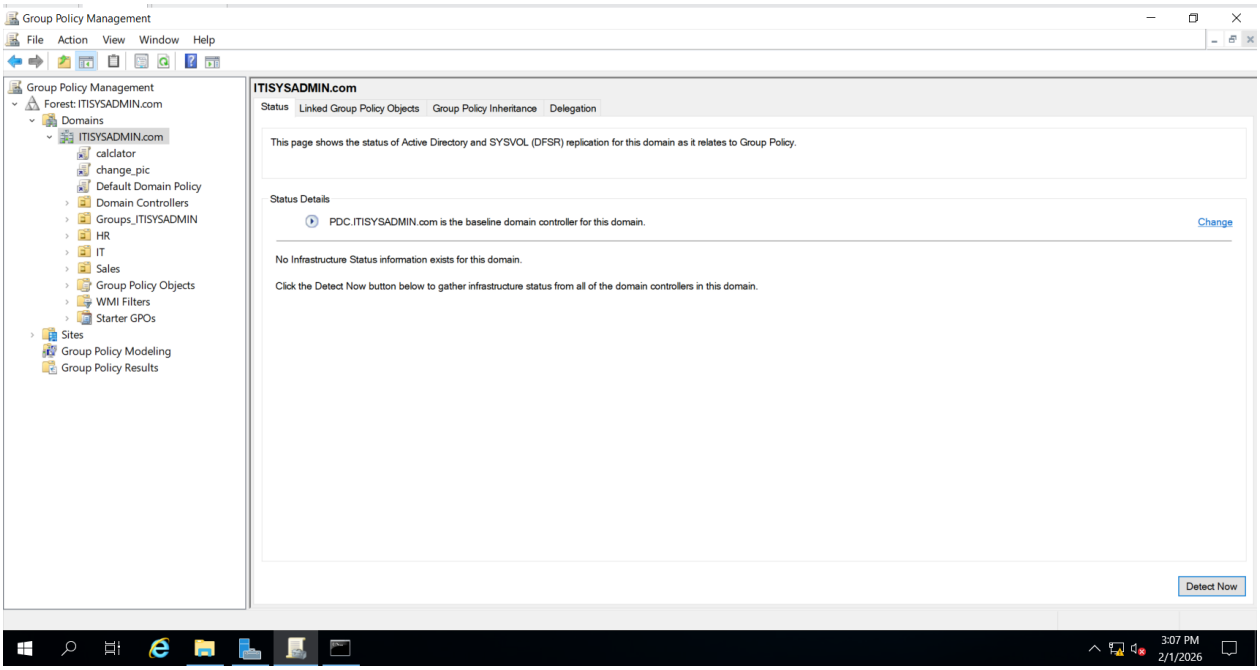
Run script to open calculator on all users.



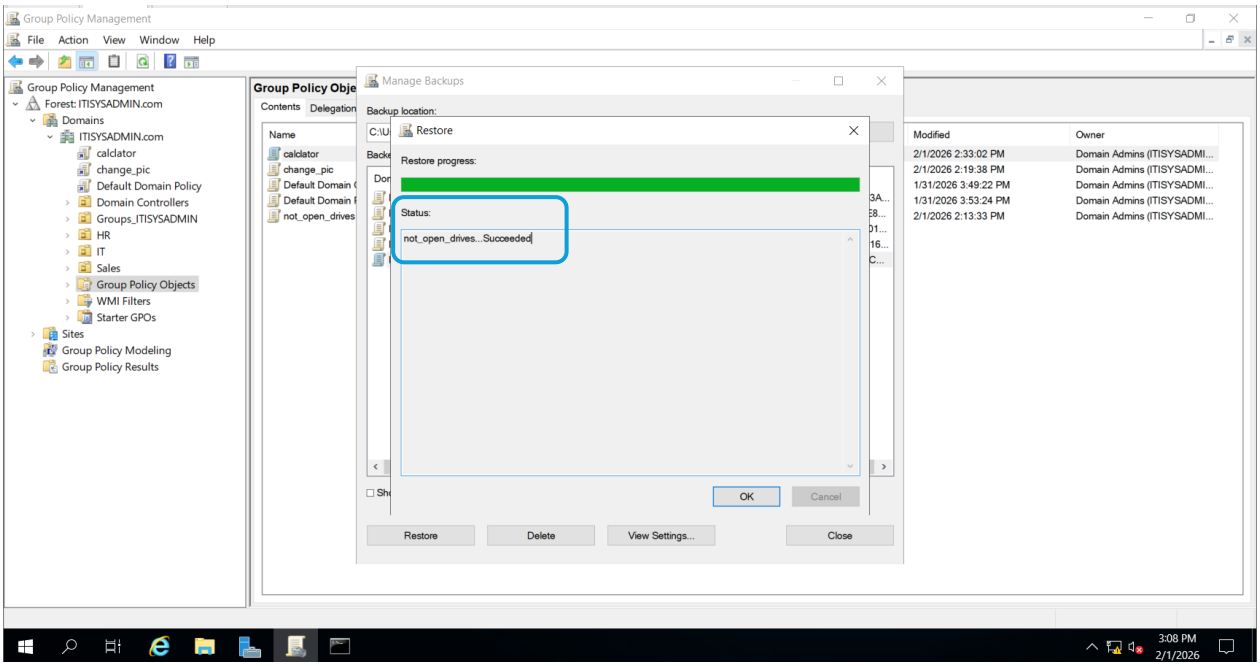
Backup GPO



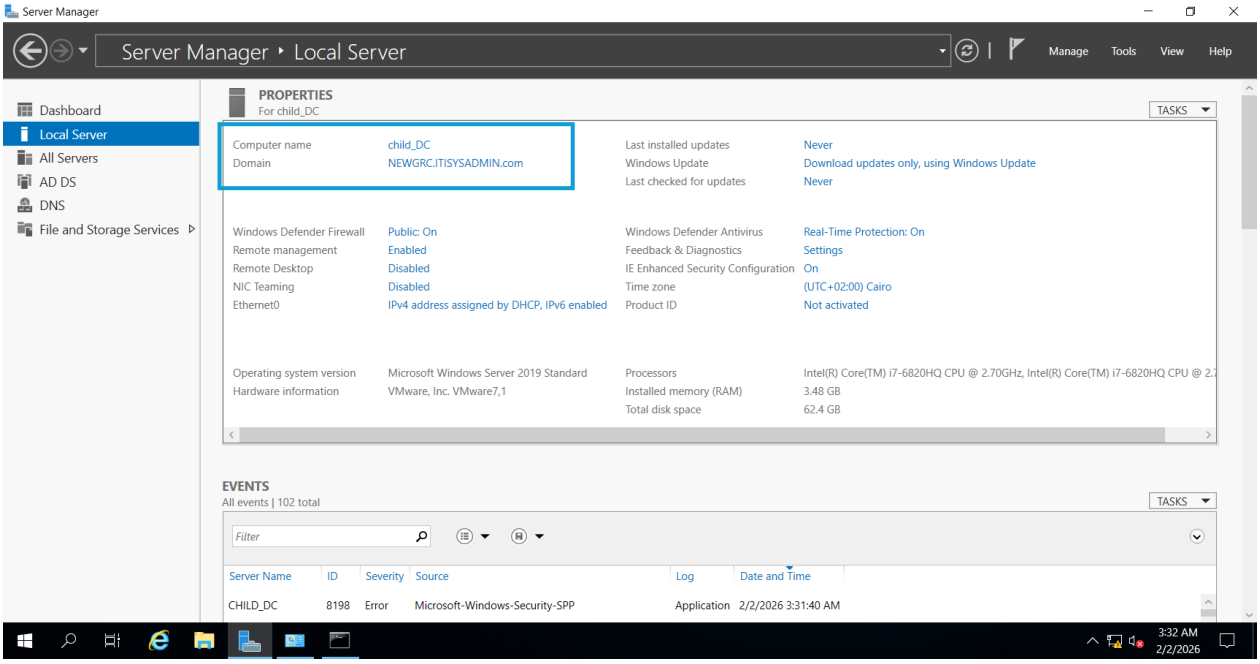
Remove GP : "not open drive"



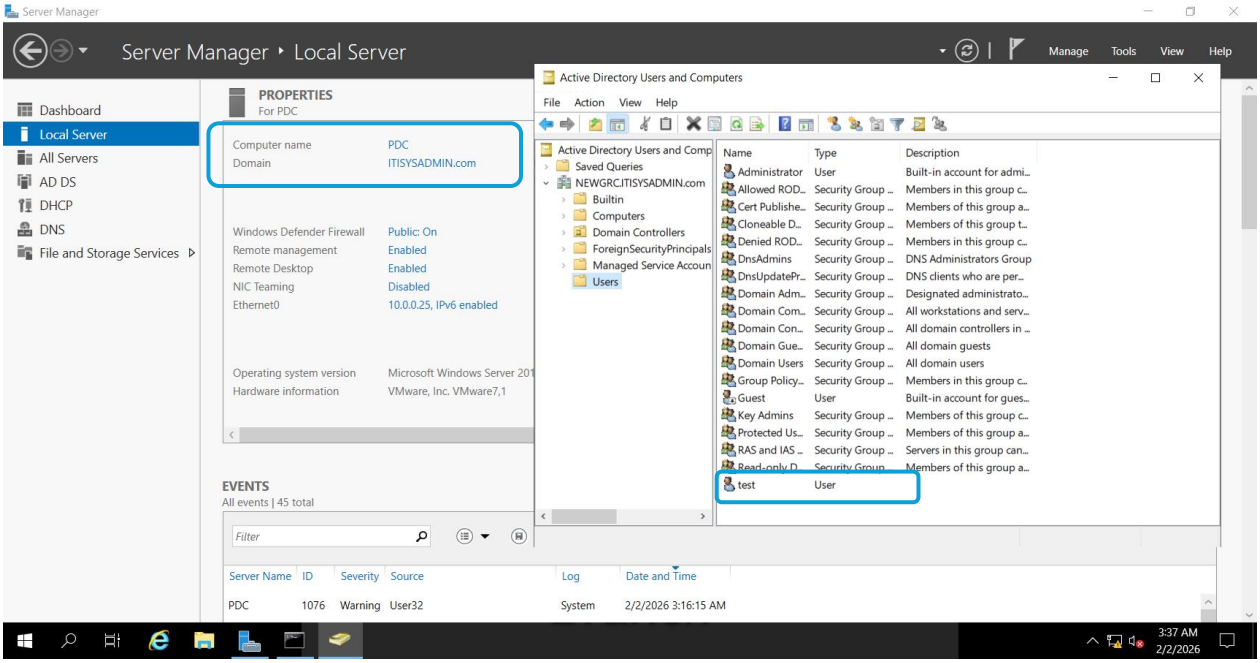
Restore it



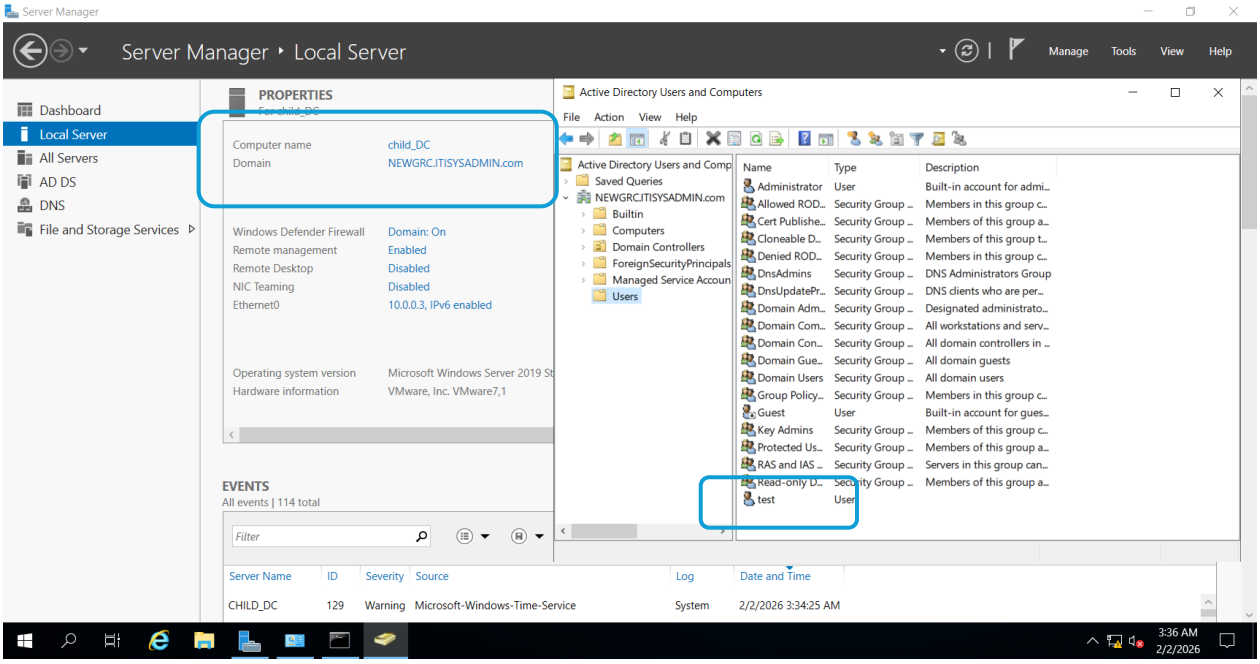
Make child DC to PDC with name NEWGRC.



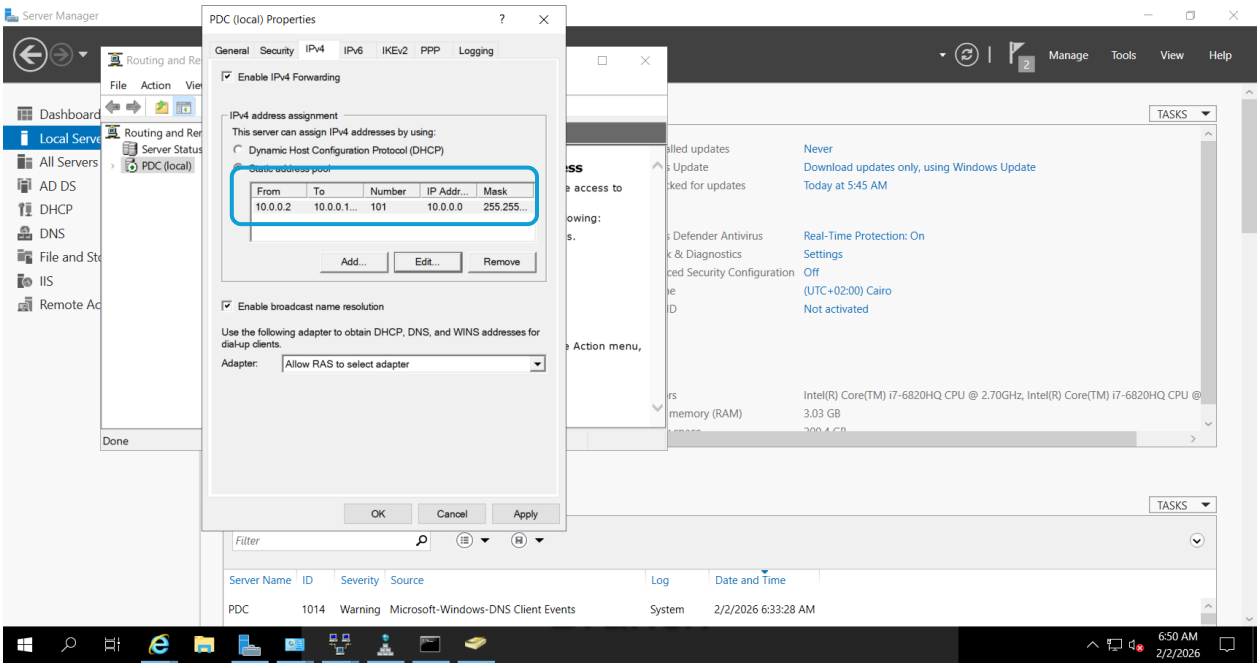
Create users (test) from PDC on child DC.

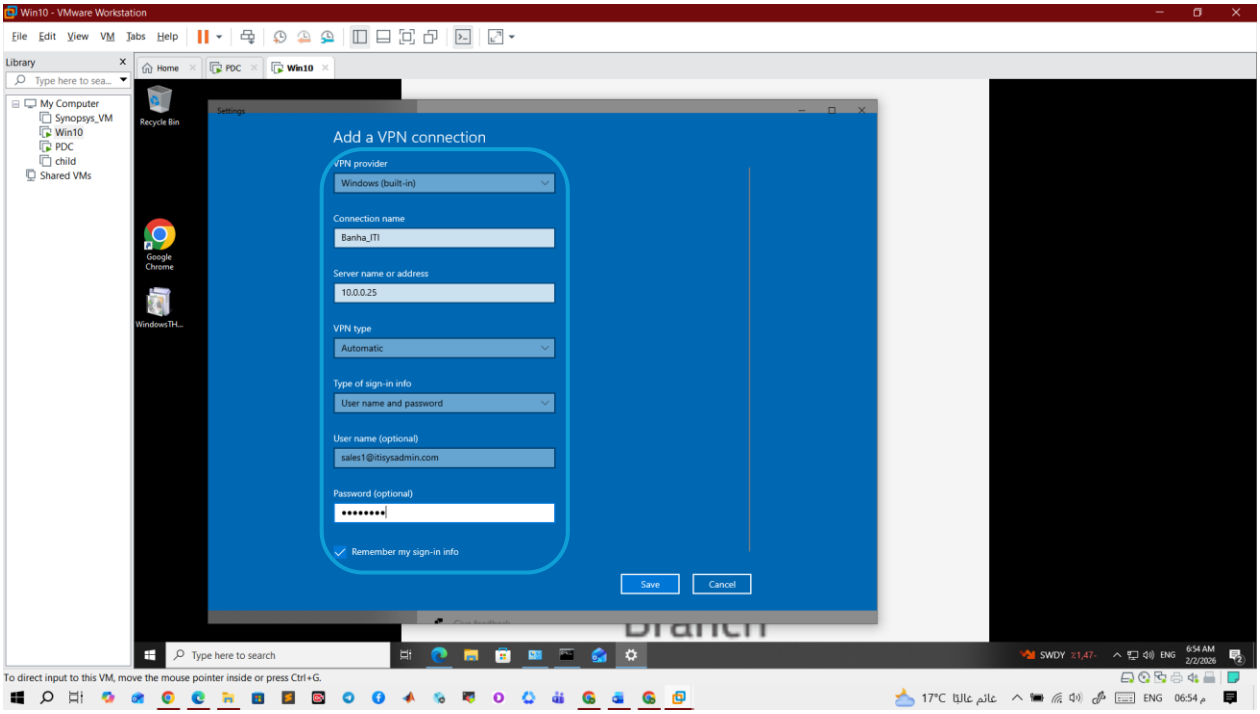


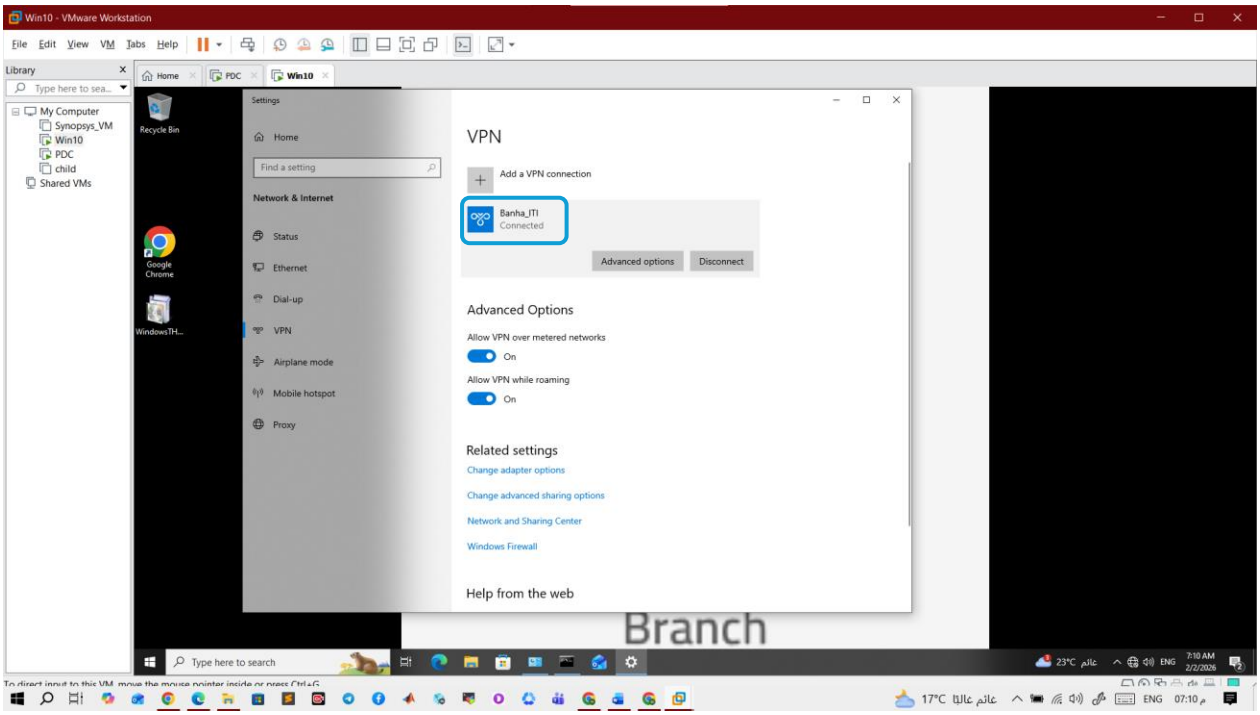
Found it in child domain



Create VPN on server

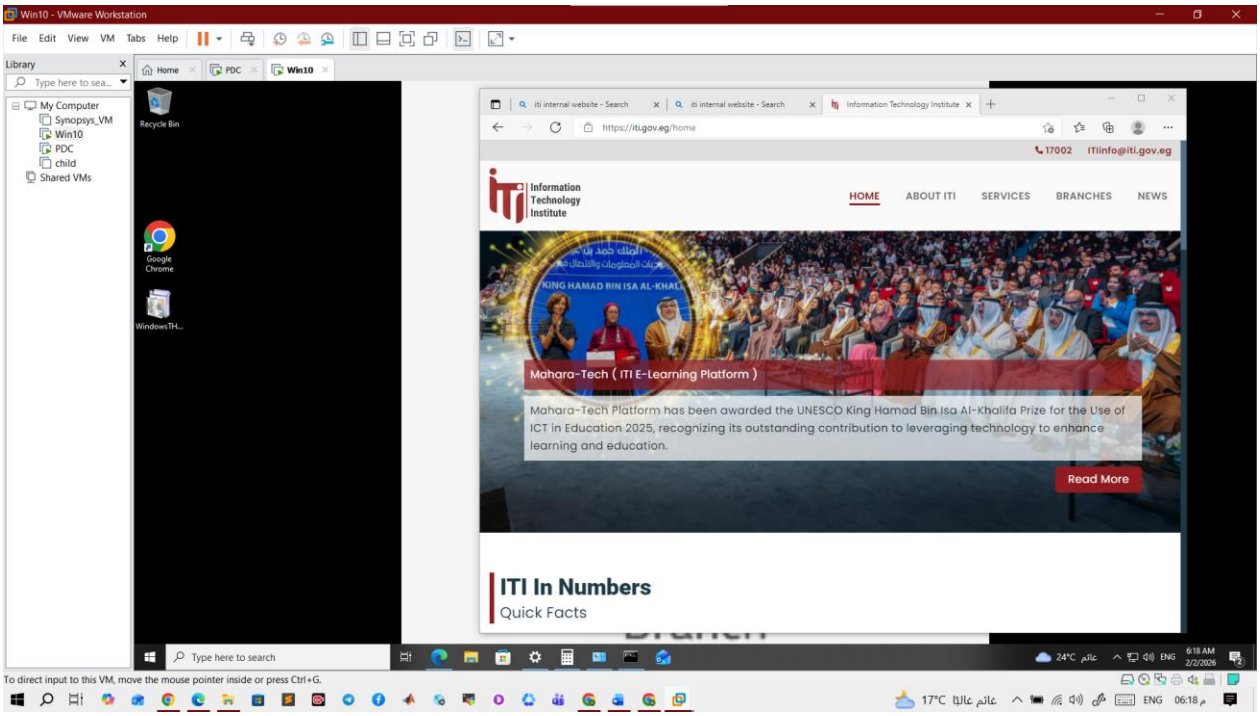




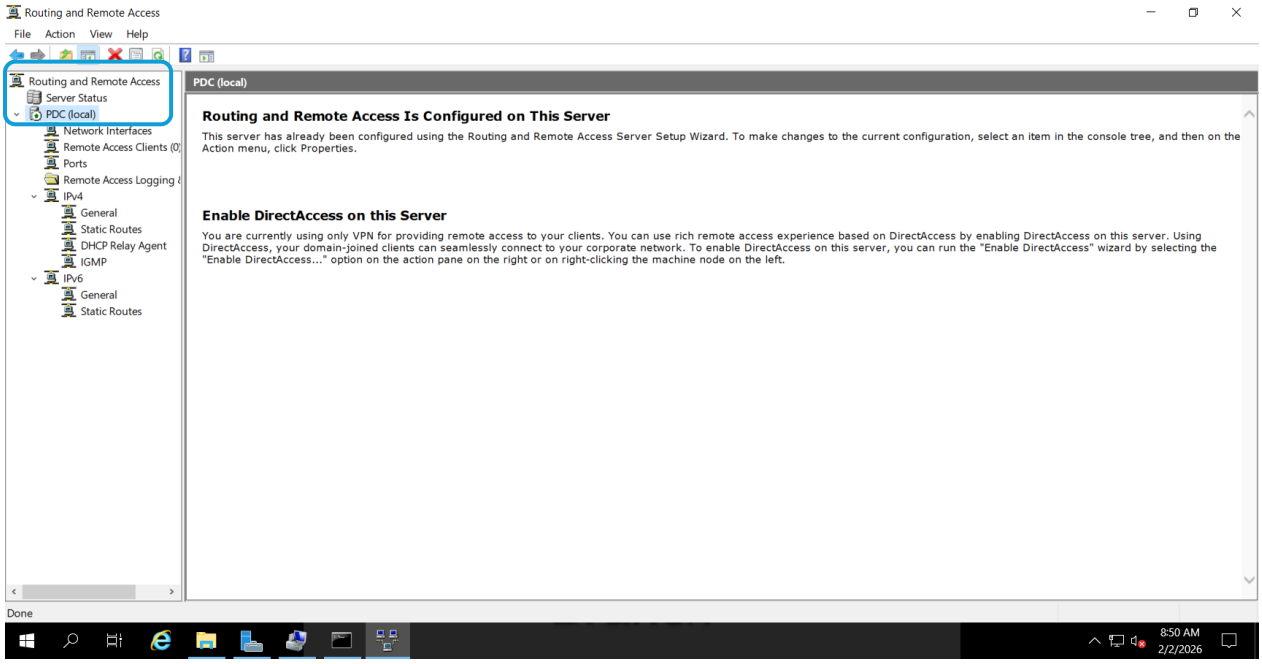

Win10 - VMware Workstation
File Edit View VM Tabs Help
Library
Type here to sea...
My Computer
Synopsys_VM
Win10
PDC
child
Shared VMs
Home
PDC
Win10
Recycle Bin
Google Chrome
WindowsTH...
Settings
Home
Find a setting
Network & Internet
Status
Ethernet
Dial-up
VPN
Airplane mode
Mobile hotspot
Proxy
VPN
Add a VPN connection
Banha_ITI
Connected
Advanced options
Disconnect
Advanced Options
Allow VPN over metered networks
On
Allow VPN while roaming
On
Related settings
Change adapter options
Change advanced sharing options
Network and Sharing Center
Windows Firewall
Help from the web
Branch
Type here to search
ENG
7:10 AM
2/2/2026

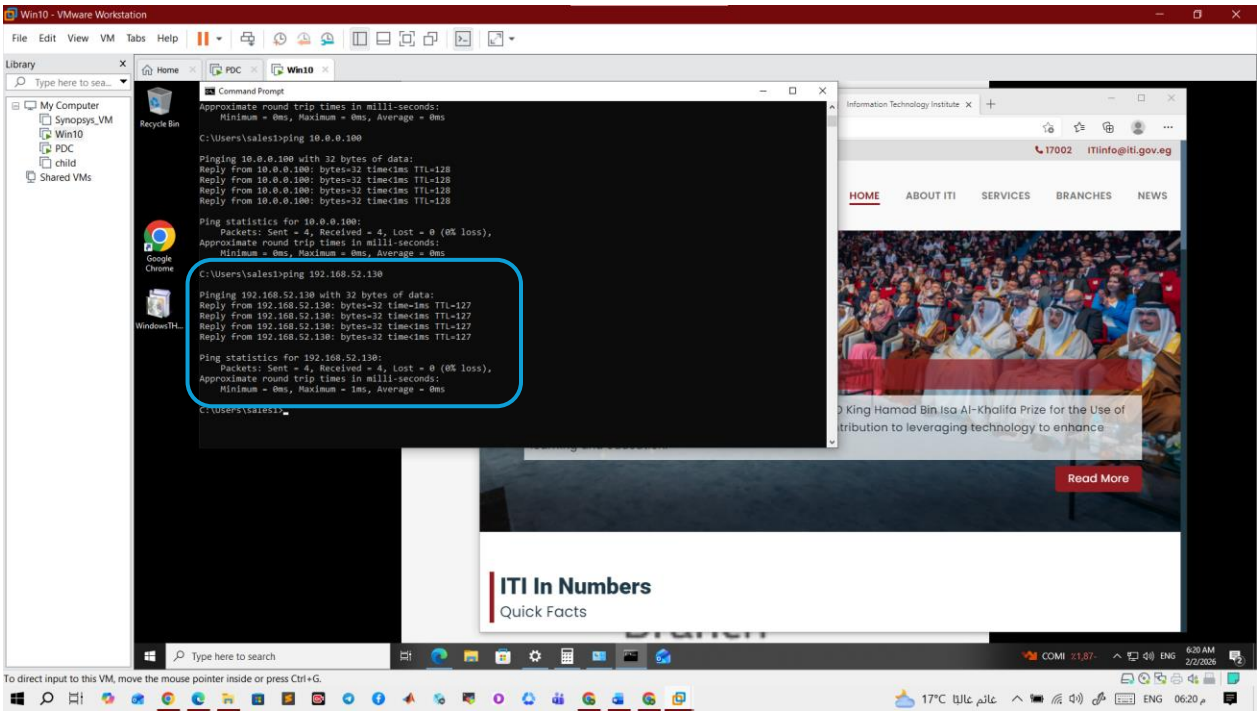
NAT

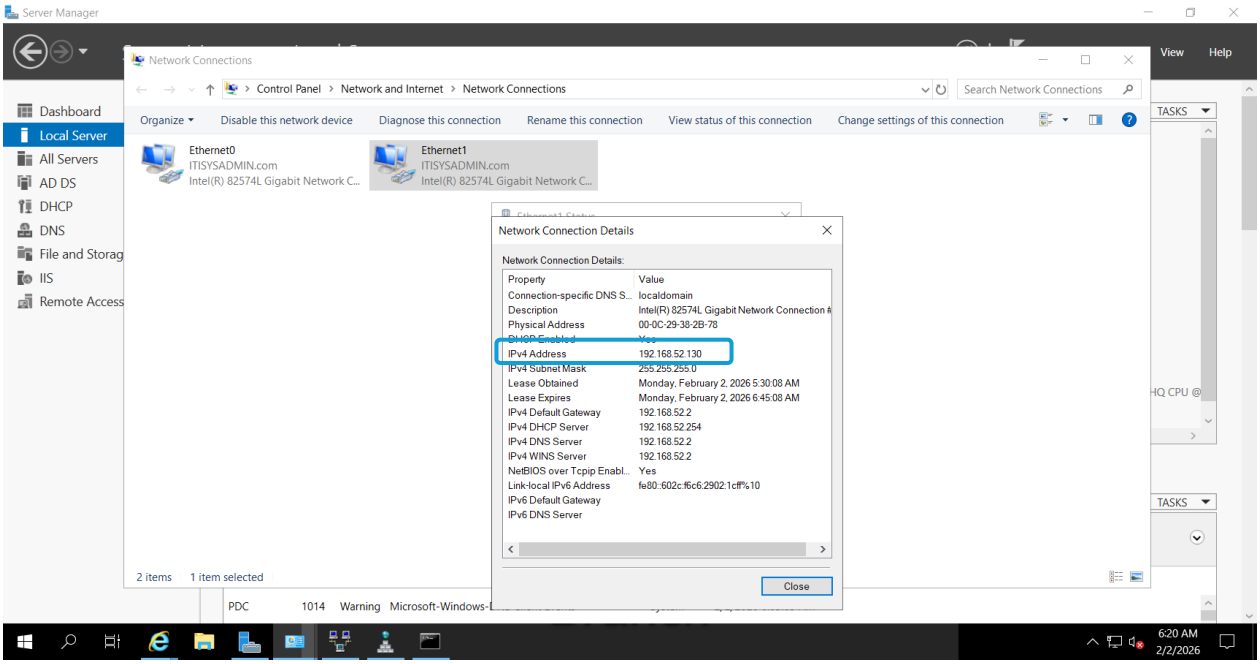
Client can access internet



Make server RRAS.

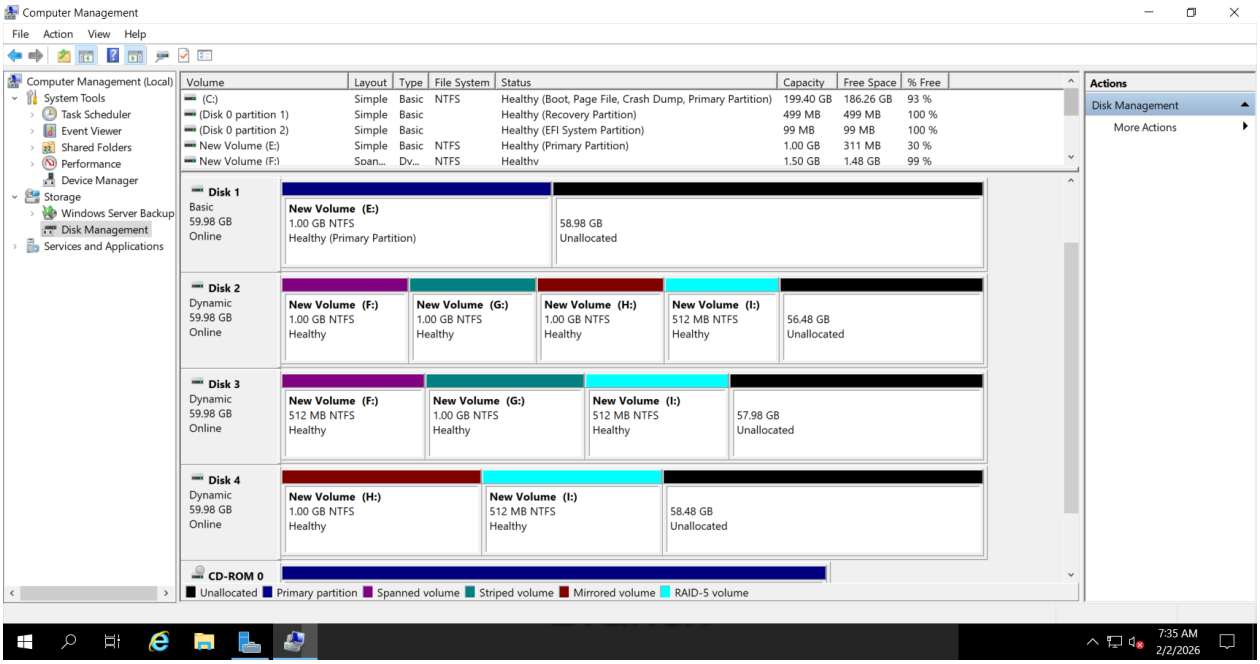



Win10 - VMware Workstation
File Edit View VM Tabs Help
Library
My Computer
Synopsys_VM
Win10
PDC
child
Shared VMs
Command Prompt
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\Users\sales1>ping 10.0.0.100
Pinging 10.0.0.100 with 32 bytes of data:
Reply from 10.0.0.100: bytes=32 time<1ms TTL=128
Ping statistics for 10.0.0.100:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
C:\Users\sales1>ping 192.168.52.130
Pinging 192.168.52.130 with 32 bytes of data:
Reply from 192.168.52.130: bytes=32 time=1ms TTL=127
Ping statistics for 192.168.52.130:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms
Information Technology Institute
17002 ITIinfo@iti.gov.eg
HOME ABOUT ITI SERVICES BRANCHES NEWS
King Hamad Bin Isa Al-Khalifa Prize for the Use of
tribution to leveraging technology to enhance
Read More
ITI In Numbers
Quick Facts
To direct input to this VM, move the mouse pointer inside or press Ctrl+G.


Server Manager
Dashboard
Local Server
All Servers
AD DS
DHCP
DNS
File and Storag
IIS
Remote Access
Network Connections
Control Panel > Network and Internet > Network Connections
Organize
Disable this network device
Diagnose this connection
Rename this connection
View status of this connection
Change settings of this connection
Ethernet0
ITISYSADMIN.com
Intel(R) 82574L Gigabit Network C...
Ethernet1
ITISYSADMIN.com
Intel(R) 82574L Gigabit Network C...
Network Connection Details
Network Connection Details:
Property
Value
Connection-specific DNS S...
localdomain
Description
Intel(R) 82574L Gigabit Network Connection
Physical Address
00-0C-29-38-2B-78
IPv4 Address
192.168.52.130
IPv4 Subnet Mask
255.255.255.0
Lease Obtained
Monday, February 2, 2026 5:30:08 AM
Lease Expires
Monday, February 2, 2026 6:45:08 AM
IPv4 Default Gateway
192.168.52.2
IPv4 DHCP Server
192.168.52.254
IPv4 DNS Server
192.168.52.2
IPv4 WINS Server
192.168.52.2
NetBIOS over Tcpip Enabl...
Yes
Link-local IPv6 Address
fe80::602c:f6c6:2902:1cff%10
IPv6 Default Gateway
IPv6 DNS Server
Close
2 items
1 item selected
PDC 1014 Warning Microsoft-Windows-
6:20 AM
2/2/2026

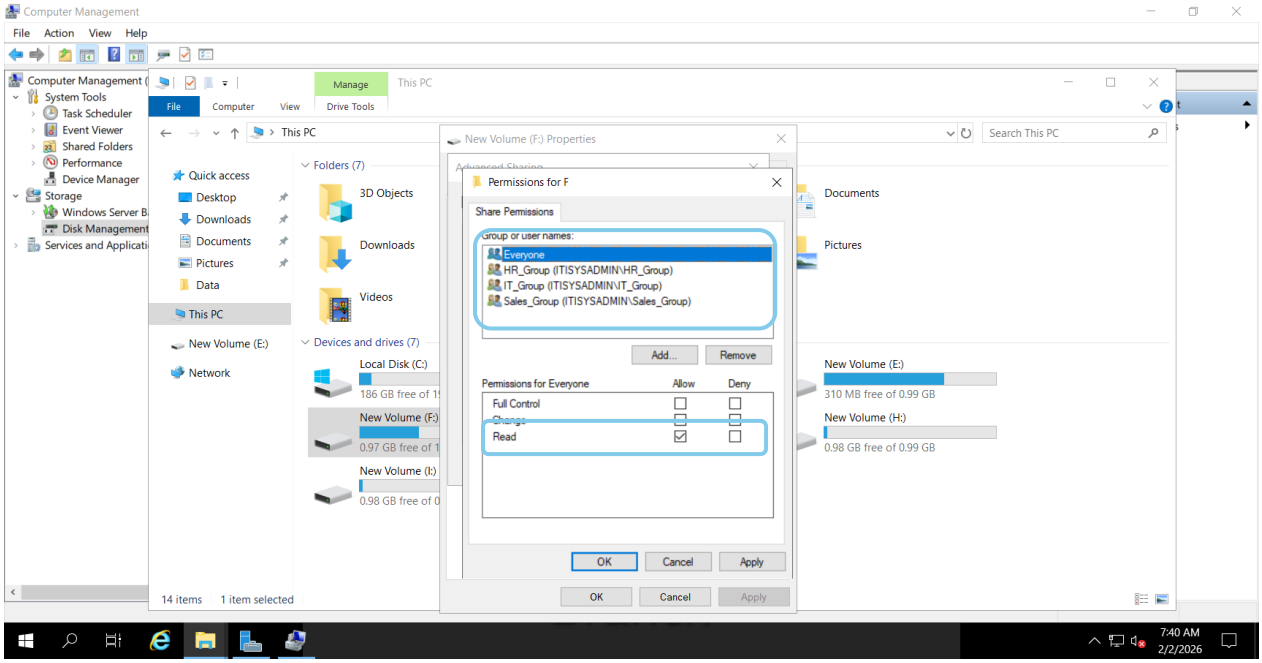
Create three volume

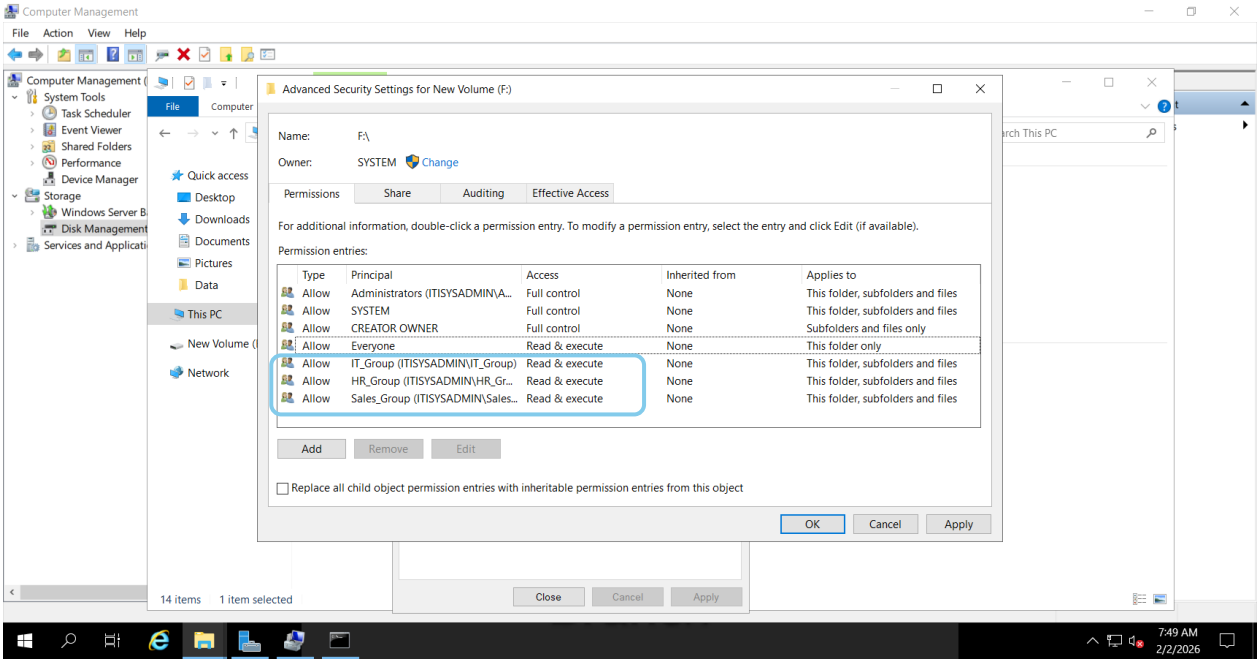
One read spanned → on Disk 2 and Disk 3
One to write stripped → on Disk 2 and Disk 3
Fault tolerance → Mirrored Volume (Disk 2 and 3) , RAID-5(Disk 3 and 4)

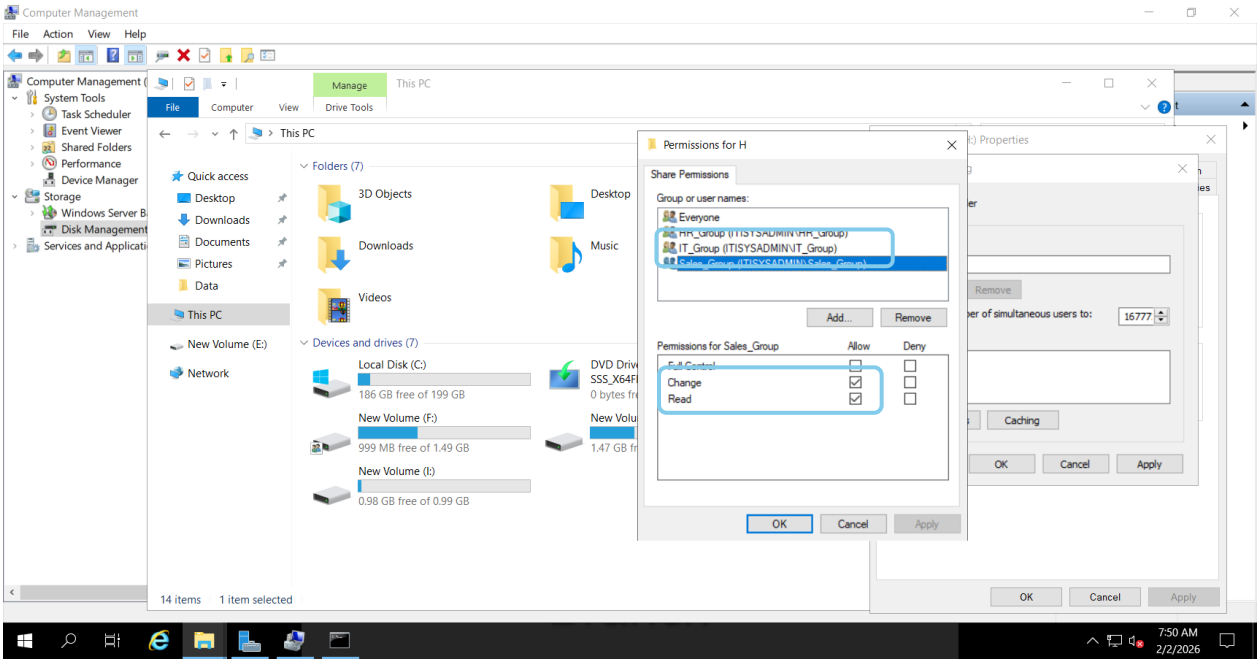
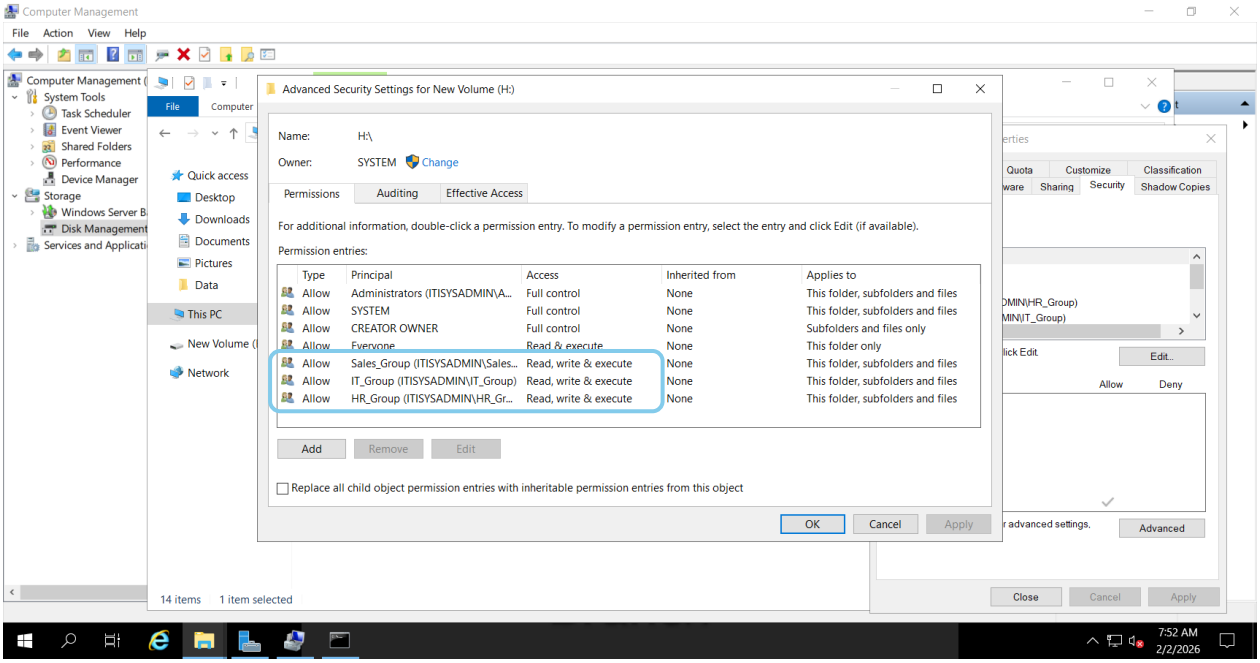


On volume F

Read





On volumes G,H,I

Write