Windows Server 2019 Home Lab | Hyper-V, Active Directory, File Sharing & Group Policy

By: Thilen Lama

Project Overview

This project provides a step-by-step guide to setting up a **Windows Server Home Lab using Hyper-V**, Microsoft's virtualization platform. The lab environment is designed to simulate a real-world IT infrastructure, enabling users to gain hands-on experience with **Active Directory (AD), Group Policy (GPO), networking, and file server management**.

The lab consists of four virtual machines (VMs):

- **Domain Controller (DC)** – Manages Active Directory and authentication.
- **File Server (FS)** – Handles shared files and folder access.
- **Client PCs (CL1 & CL2)** – Represent end-user workstations.

The setup process includes:

- Creating a **private virtual network**.
- Assigning **static IP addresses**.
- Deploying **Active Directory Domain Services (AD DS)**.
- Configuring **file-sharing permissions**.
- Implementing **Group Policy Objects (GPOs)** for automation and security.

By completing this project, users gain **practical IT administration skills** in a virtualized environment, essential for roles such as **System Administrator, Network Engineer, and IT Support Specialist**.

Video Tutorial

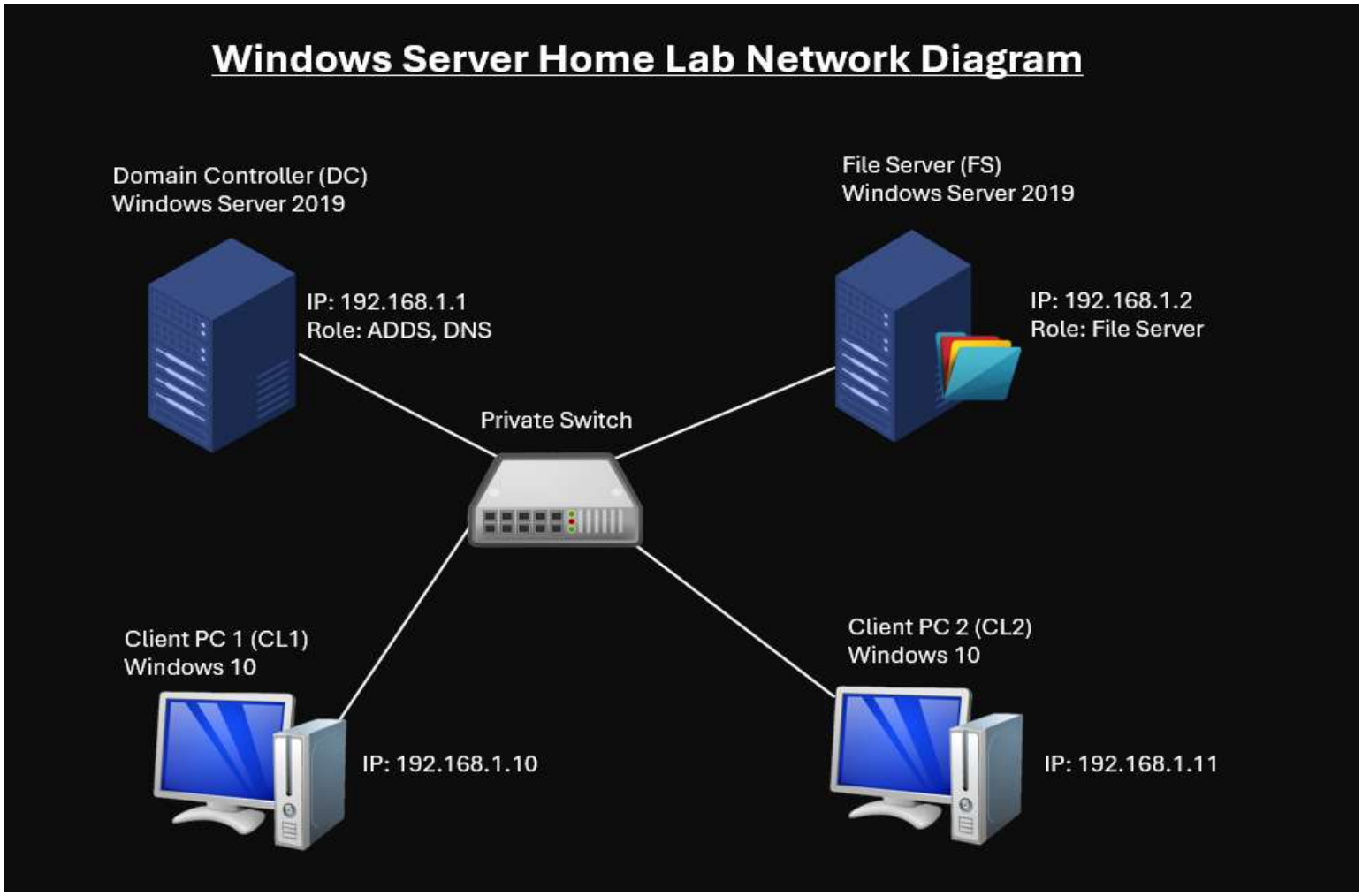
For a step-by-step walkthrough of this project, watch the video tutorial on YouTube:

📺 **[Project Video Tutorial: Windows Server Home Lab Setup]**

YouTube Video Link: https://youtu.be/uVXhl9AVl44

This video provides a visual guide to complement this document, helping you follow along with the setup process.

Network Diagram



Prerequisites

1. **Enable Hyper-V** (if using **Windows 10/11 Pro or Enterprise**).
   - *Note: Hyper-V is not available on Windows 10/11 Home. If using the Home edition, consider using a supported third-party virtualization tool such as VirtualBox or VMware Workstation Player.*

2. **Download Required ISO Files:**
   - **Windows Server 2019 ISO** (for the **Domain Controller** and **File Server**).
   - **Windows 10 ISO** (for **client PCs**).

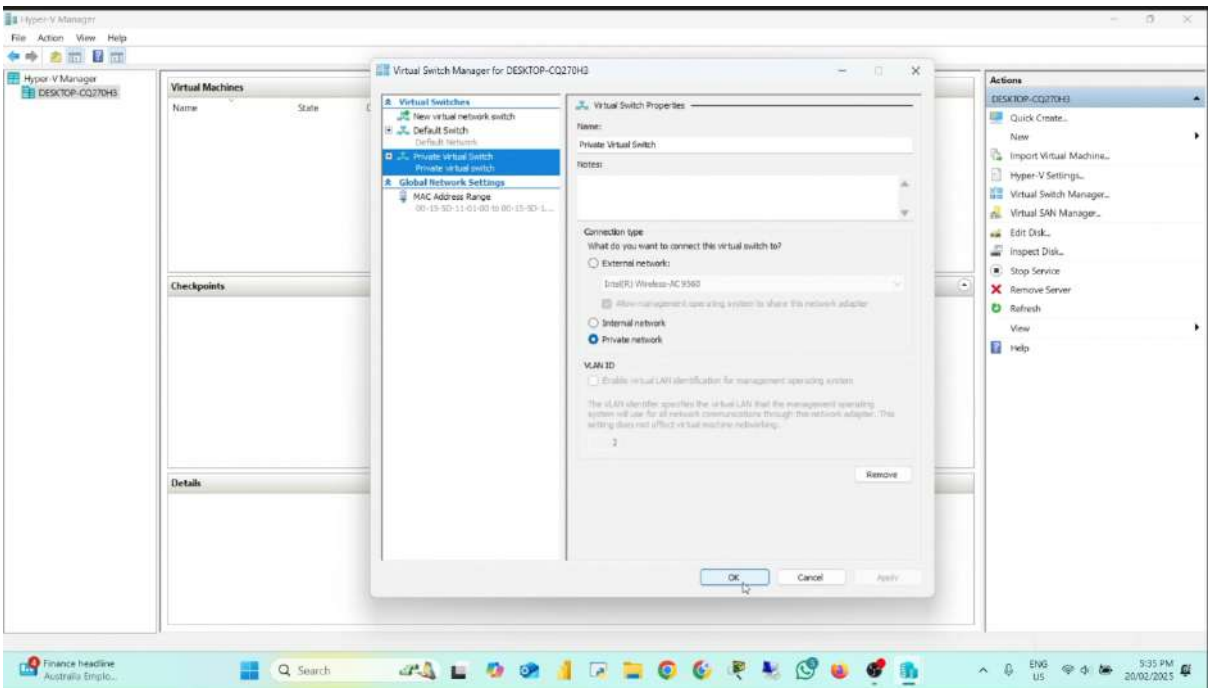
   Links for download:
   Download Windows Server 2019 ISO
   Download Windows 10 ISO

Table of Contents

1. Create a Virtual Network Switch

A virtual network switch enables communication between virtual machines (VMs) within Hyper-V.

We will set up a Private Switch, which restricts communication to only the VMs within the lab. This ensures an isolated testing environment without external network interference.



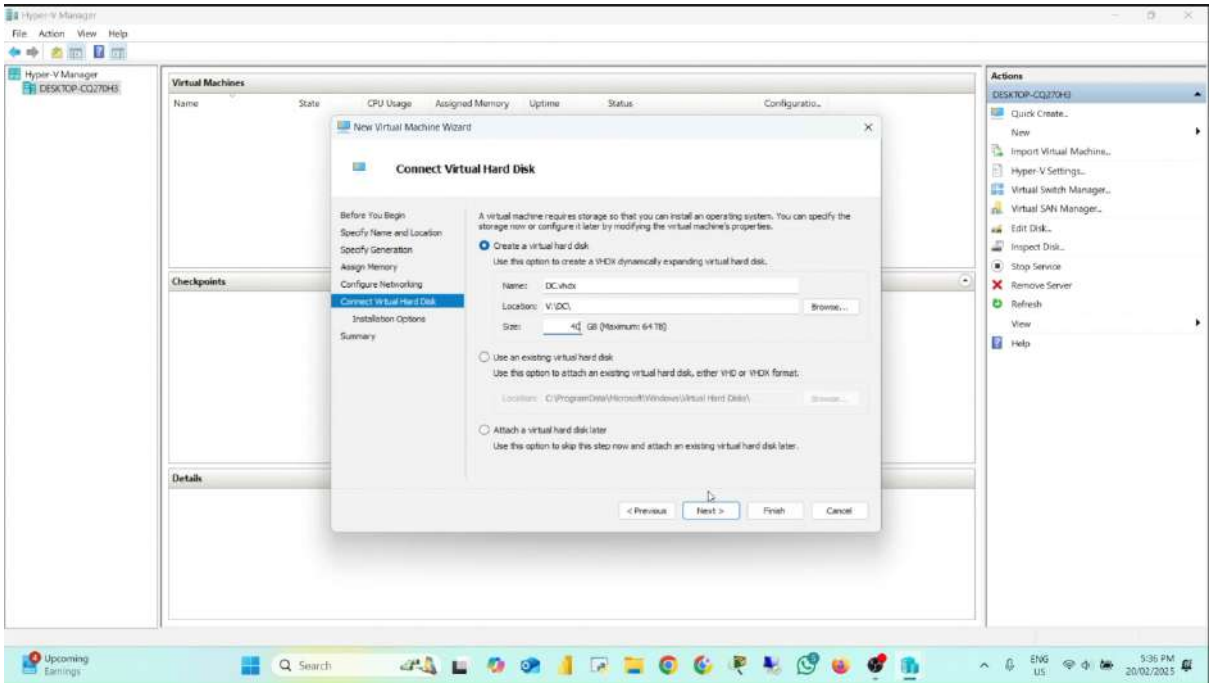
2. Create Virtual Machines (VMs) and install Operating Systems on VMs

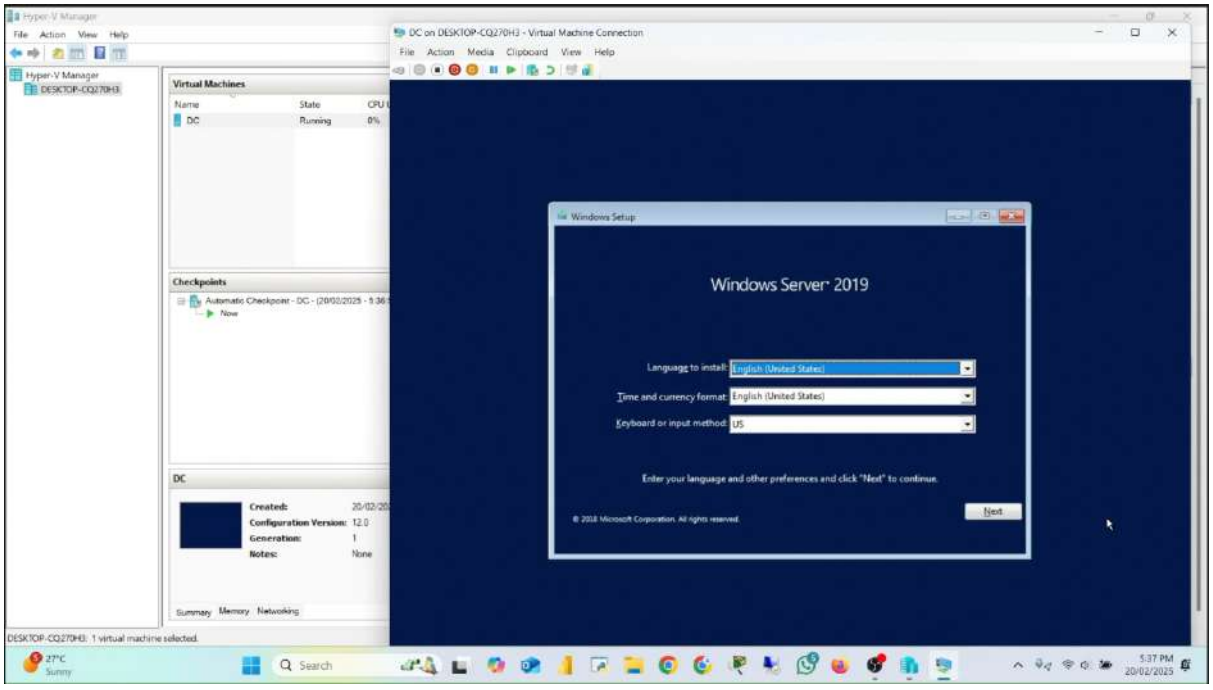
We will create four virtual machines to simulate an **IT network**:

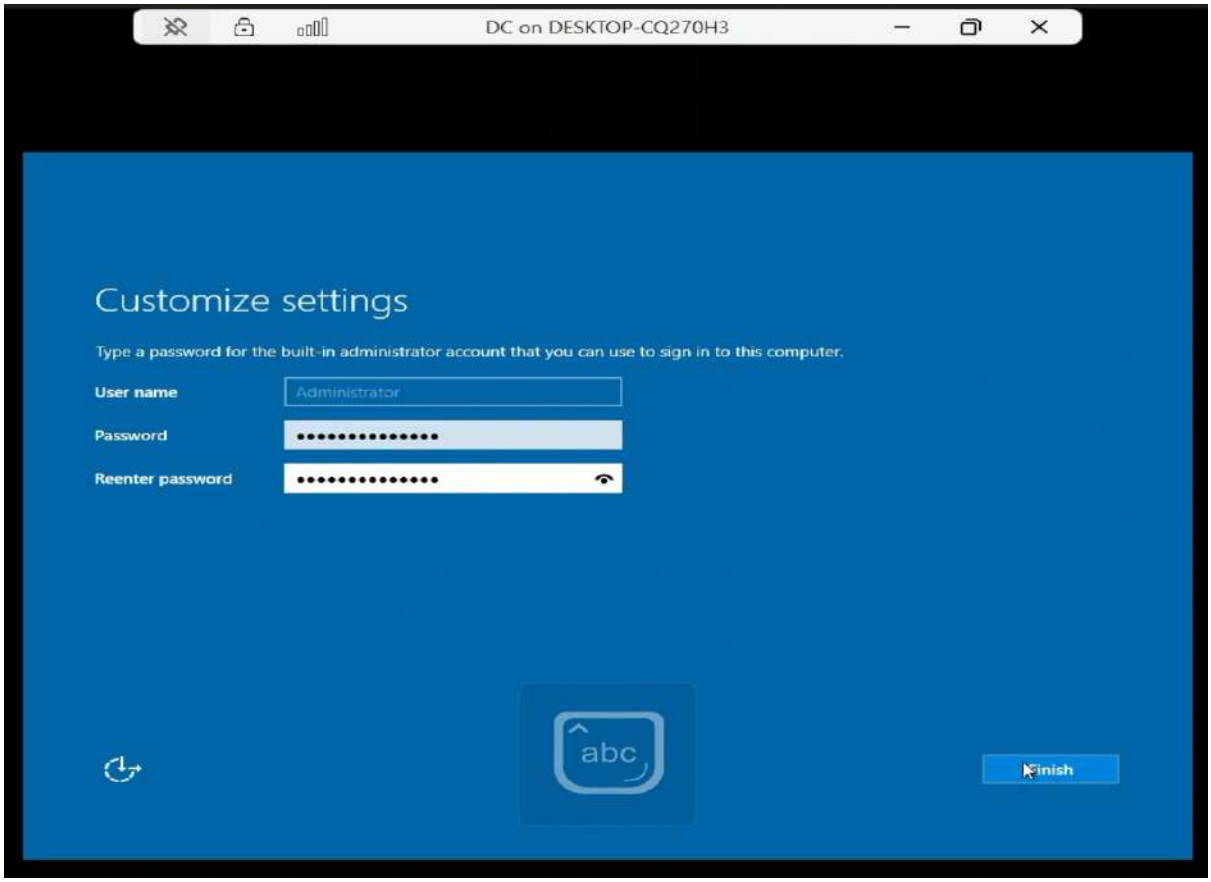
- **Domain Controller (DC)** – Manages user authentication and network policies.
- **File Server (FS)** – Stores and shares files among users.
- **Client PCs (CL1 & CL2)** – Represent standard user workstations.

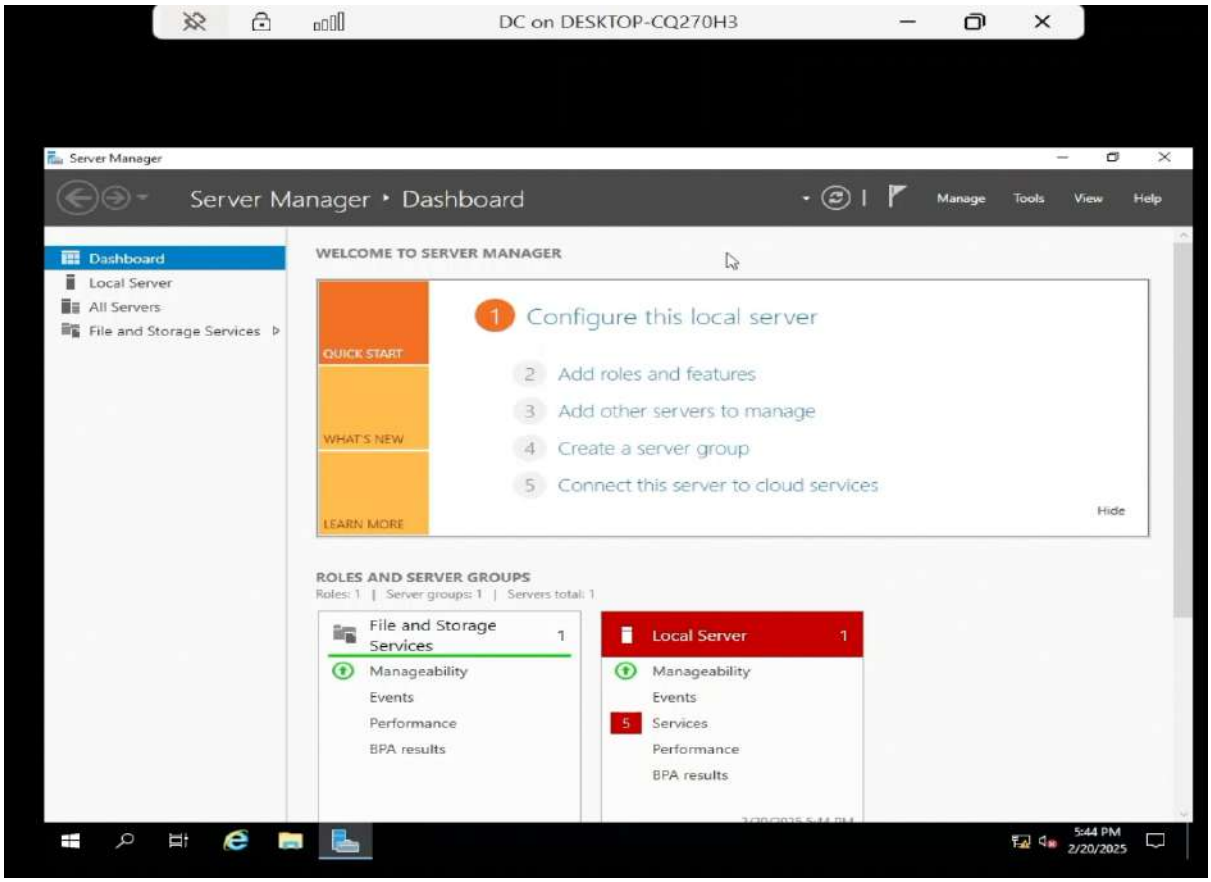
Each VM will be allocated specific resources (e.g., **RAM: 2048 MB, Storage: 40 GB**) to optimize performance.

Set Up Microsoft Server for Domain Controller (DC)

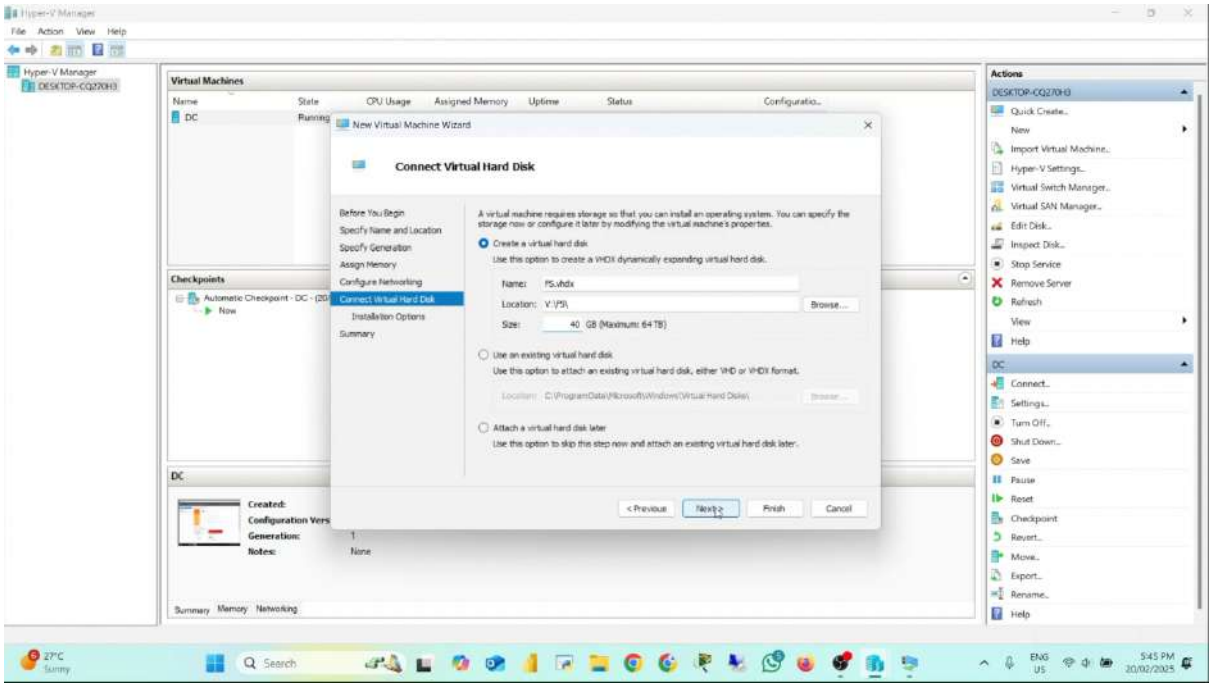


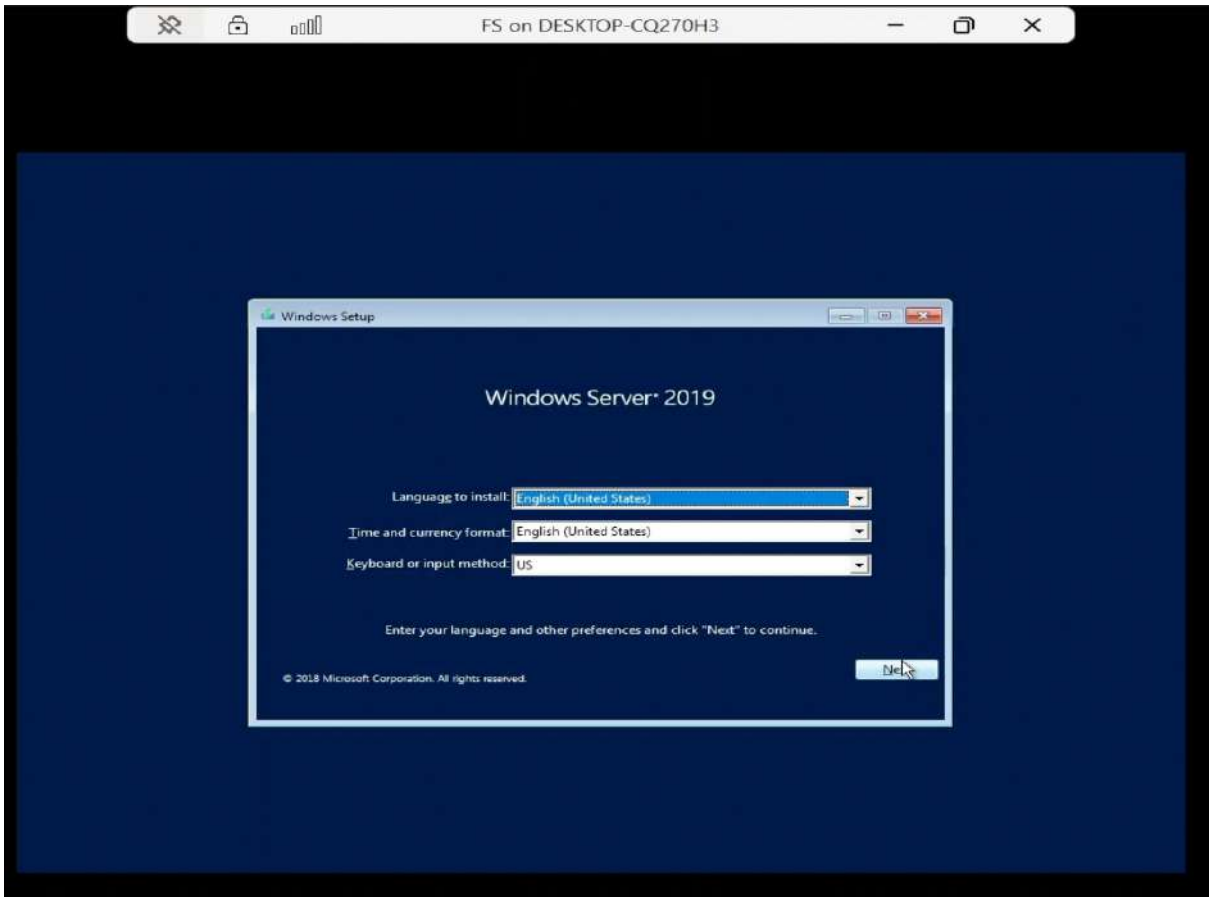


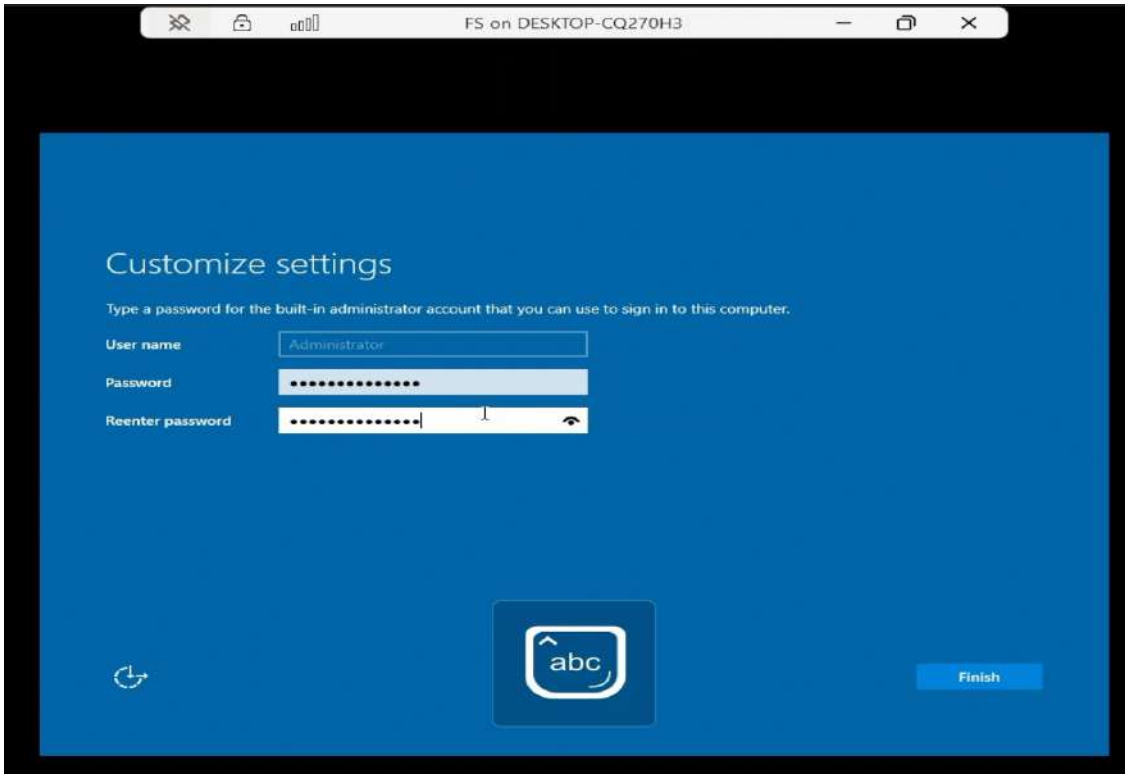

DC on DESKTOP-CQ270H3
Customize settings
Type a password for the built-in administrator account that you can use to sign in to this computer.
User name
Administrator
Password
Reenter password
abc
Finish

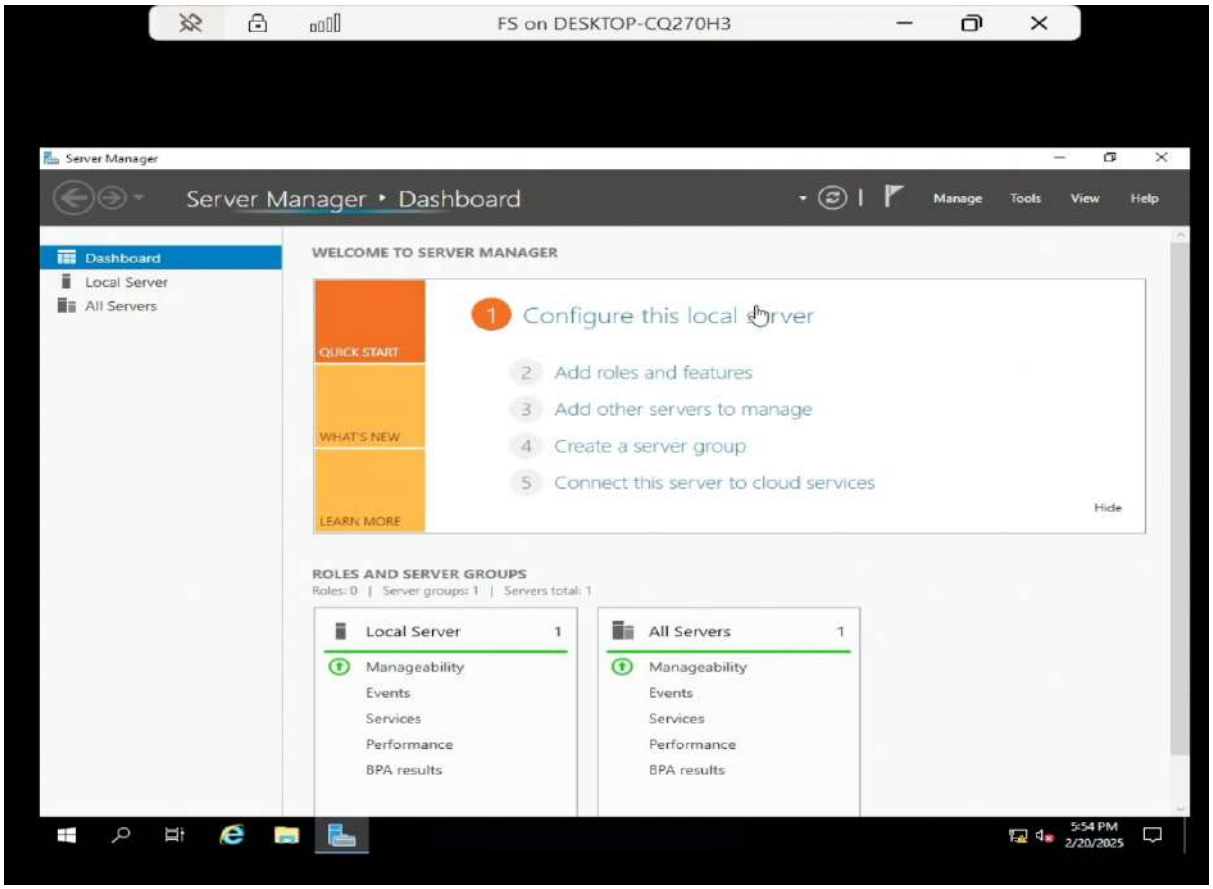

DC on DESKTOP-CQ270H3
Server Manager
Server Manager • Dashboard
Manage
Tools
View
Help
Dashboard
Local Server
All Servers
File and Storage Services
WELCOME TO SERVER MANAGER
QUICK START
WHAT'S NEW
LEARN MORE
1 Configure this local server
2 Add roles and features
3 Add other servers to manage
4 Create a server group
5 Connect this server to cloud services
Hide
ROLES AND SERVER GROUPS
Roles: 1 | Server groups: 1 | Servers total: 1
File and Storage Services 1
Manageability
Events
Performance
BPA results
Local Server 1
Manageability
Events
5 Services
Performance
BPA results
5:44 PM
2/20/2025

Set Up Microsoft Server for File Server (FS)






FS on DESKTOP-CQ270H3
Customize settings
Type a password for the built-in administrator account that you can use to sign in to this computer.
User name
Administrator
Password
Reenter password
abc
Finish


FS on DESKTOP-CQ270H3
Server Manager
Server Manager • Dashboard
Manage
Tools
View
Help
Dashboard
Local Server
All Servers
WELCOME TO SERVER MANAGER
QUICK START
WHAT'S NEW
LEARN MORE
1 Configure this local server
2 Add roles and features
3 Add other servers to manage
4 Create a server group
5 Connect this server to cloud services
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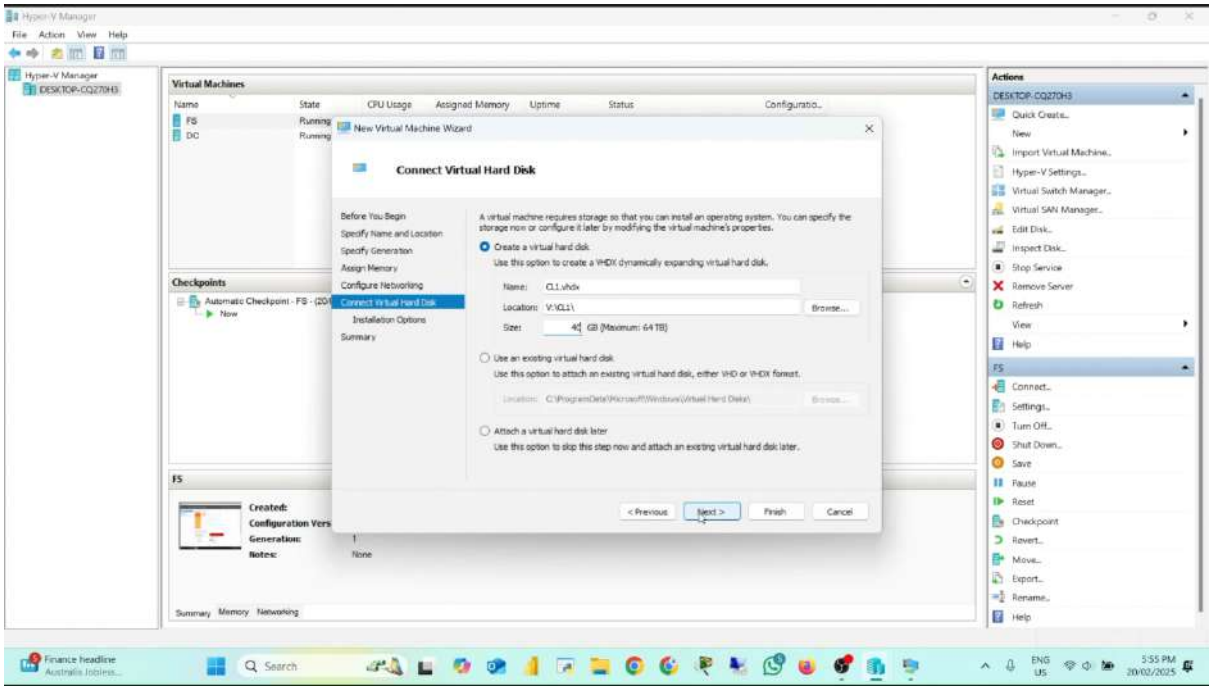
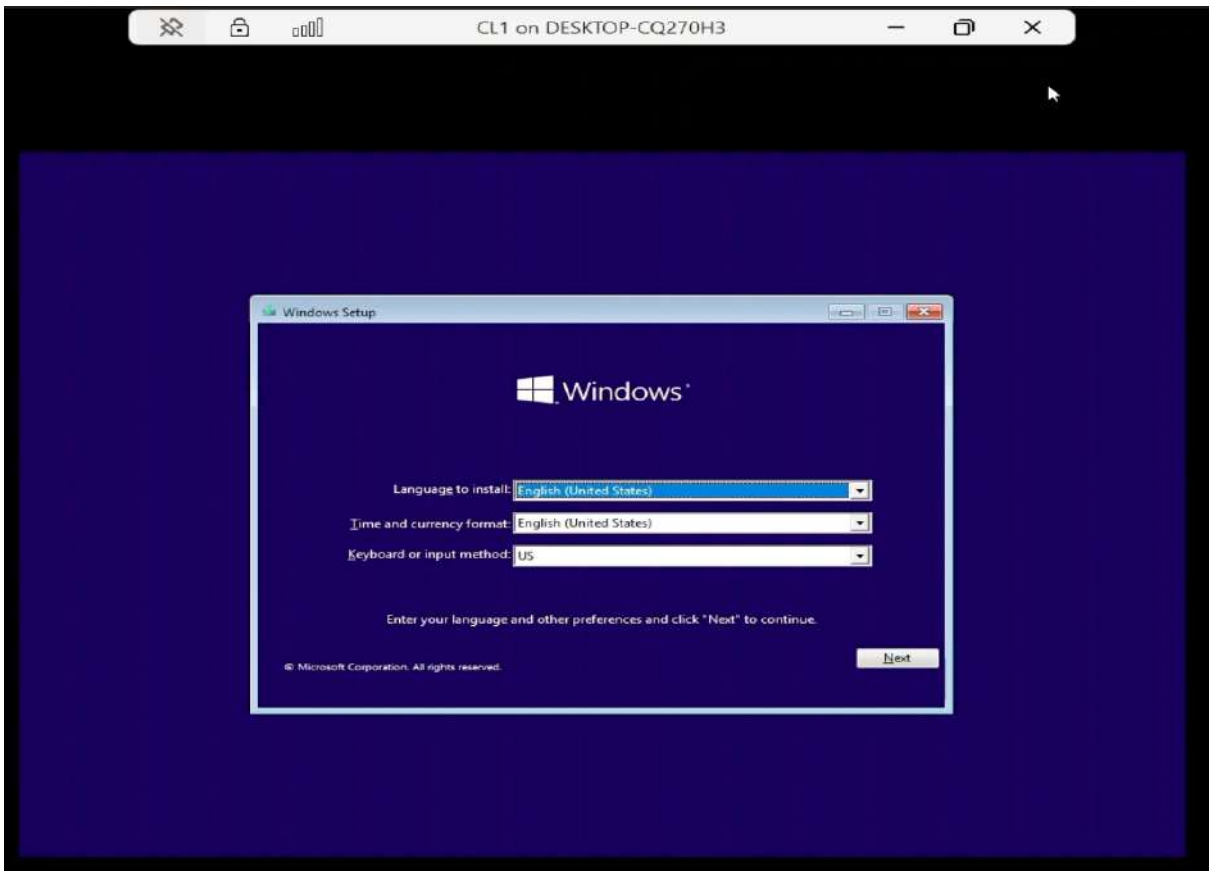
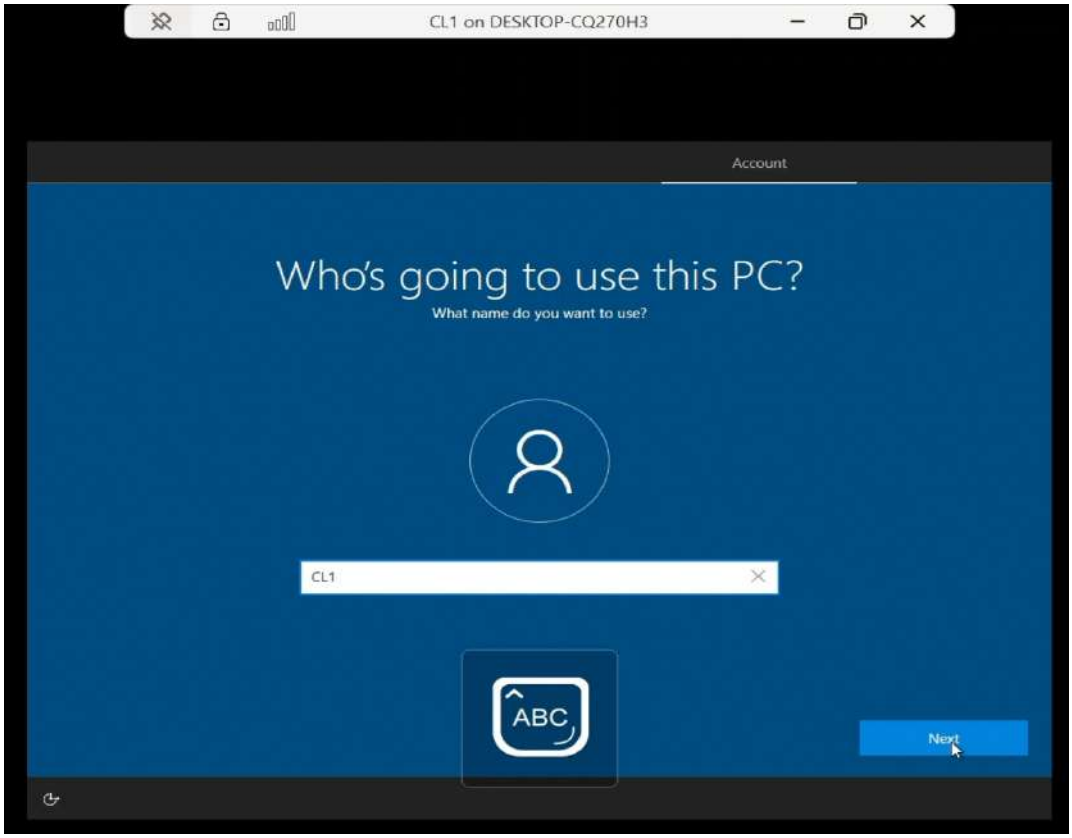
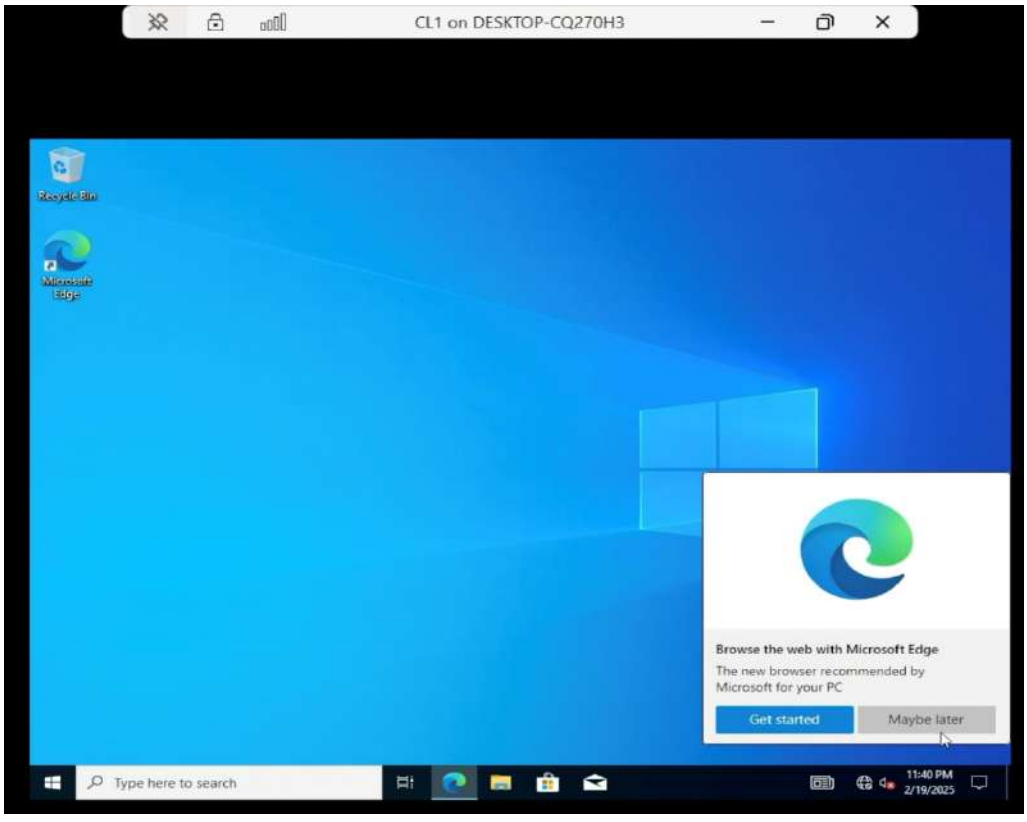
ROLES AND SERVER GROUPS
Roles: 0 | Server groups: 1 | Servers total: 1
Local Server 1
Manageability
Events
Services
Performance
BPA results
All Servers 1
Manageability
Events
Services
Performance
BPA results
5:54 PM
2/20/2025

Set Up Windows 10 for Client PC 1 (CL1)

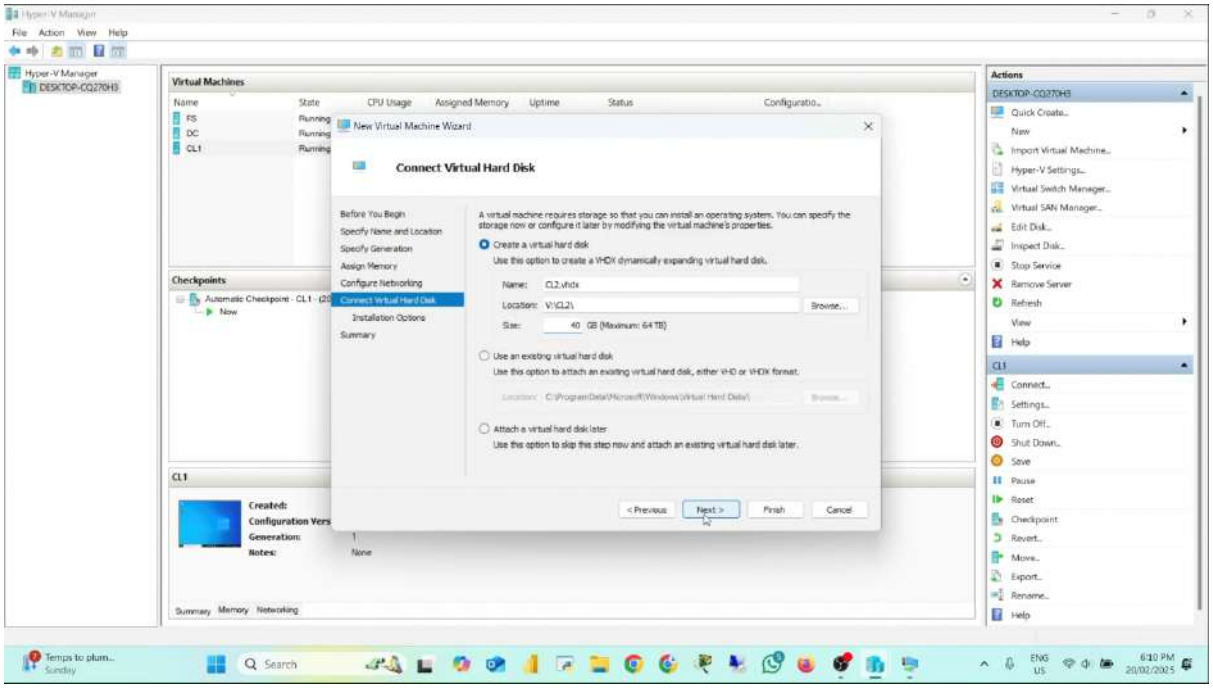


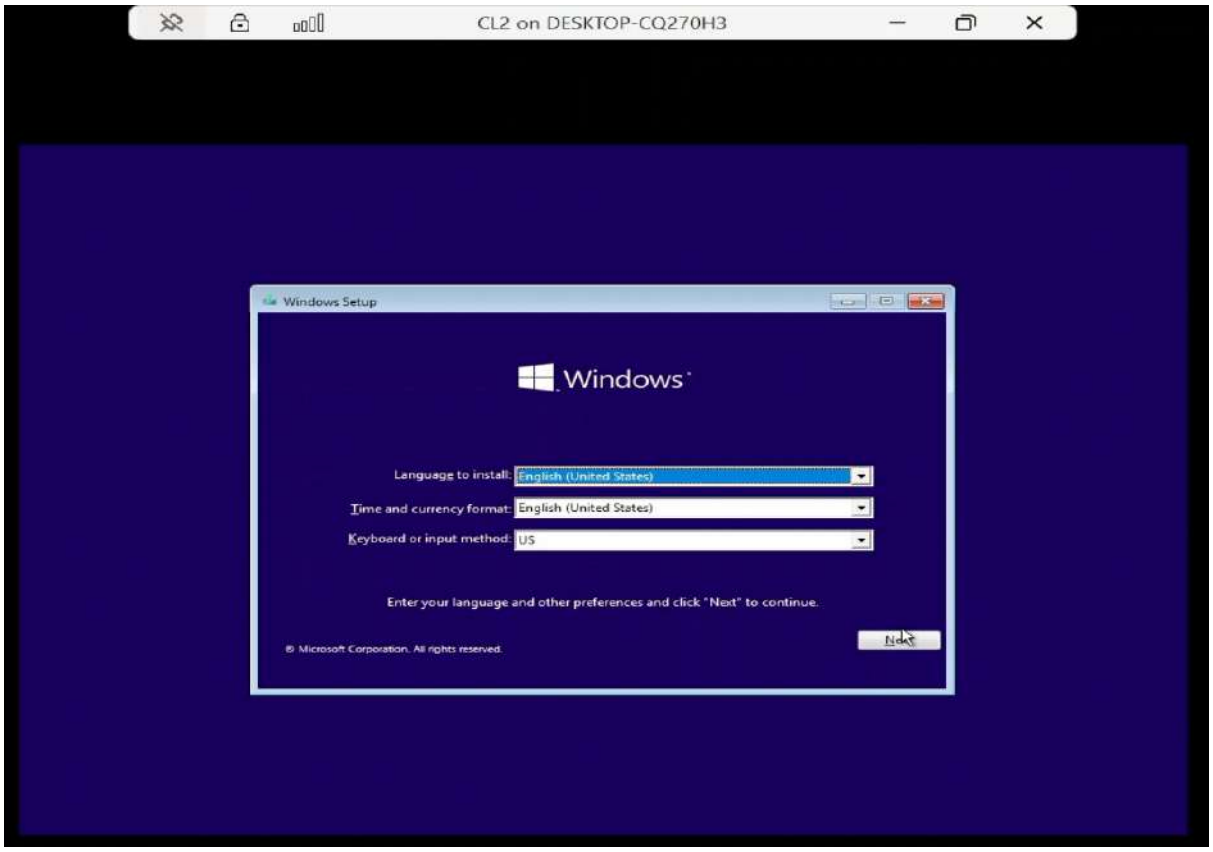


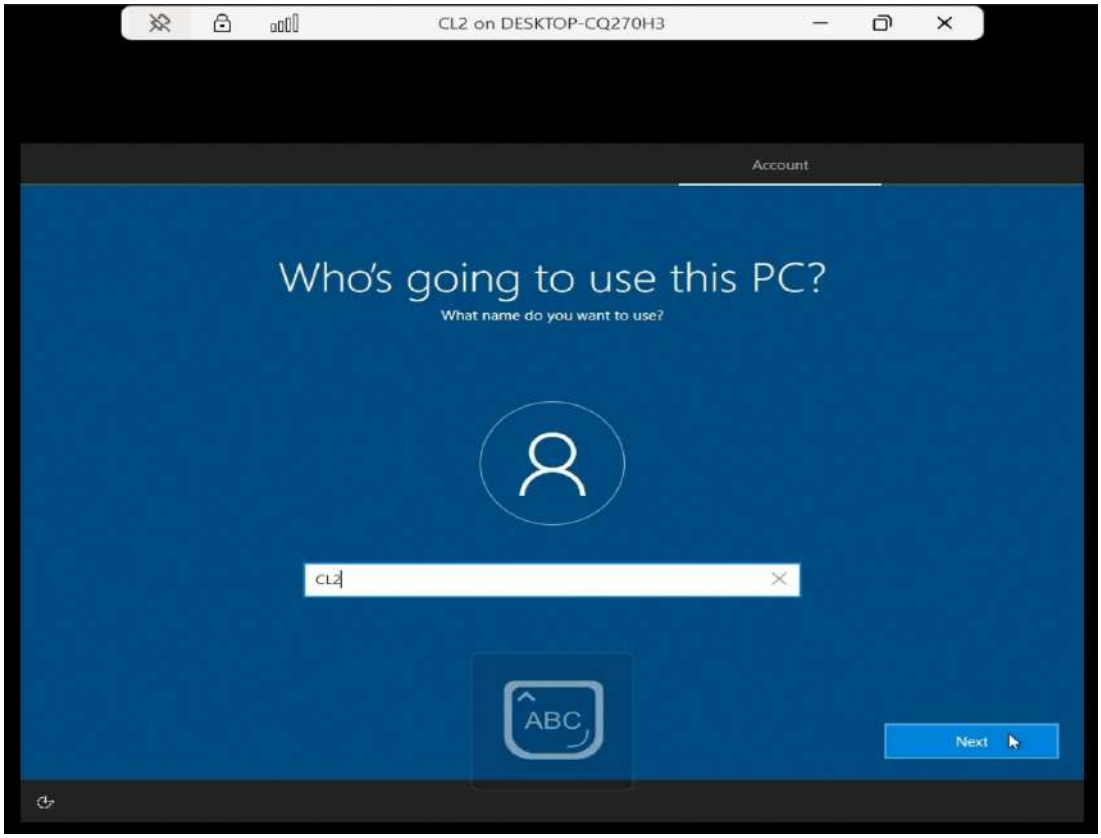

CL1 on DESKTOP-CQ270H3
Account
Who's going to use this PC?
What name do you want to use?
CL1
ABC
Next

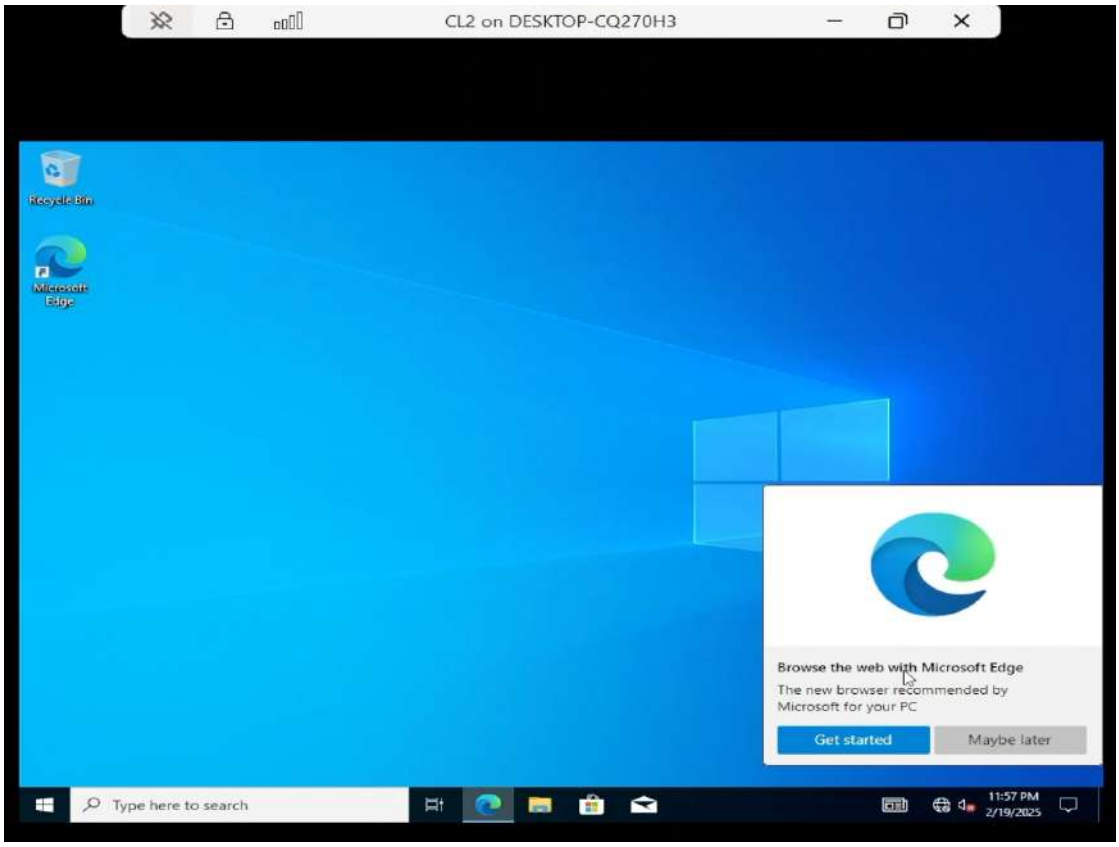

CL1 on DESKTOP-CQ270H3
Recycle Bin
Microsoft Edge
Browse the web with Microsoft Edge
The new browser recommended by Microsoft for your PC
Get started
Maybe later
Type here to search
11:40 PM
2/19/2025

Set Up Windows 10 for Client PC 2 (CL2)






CL2 on DESKTOP-CQ270H3
Account
Who's going to use this PC?
What name do you want to use?
CL2
ABC
Next


CL2 on DESKTOP-CQ270H3
Recycle Bin
Microsoft Edge
Browse the web with Microsoft Edge
The new browser recommended by Microsoft for your PC
Get started
Maybe later
Type here to search
11:57 PM
2/19/2025

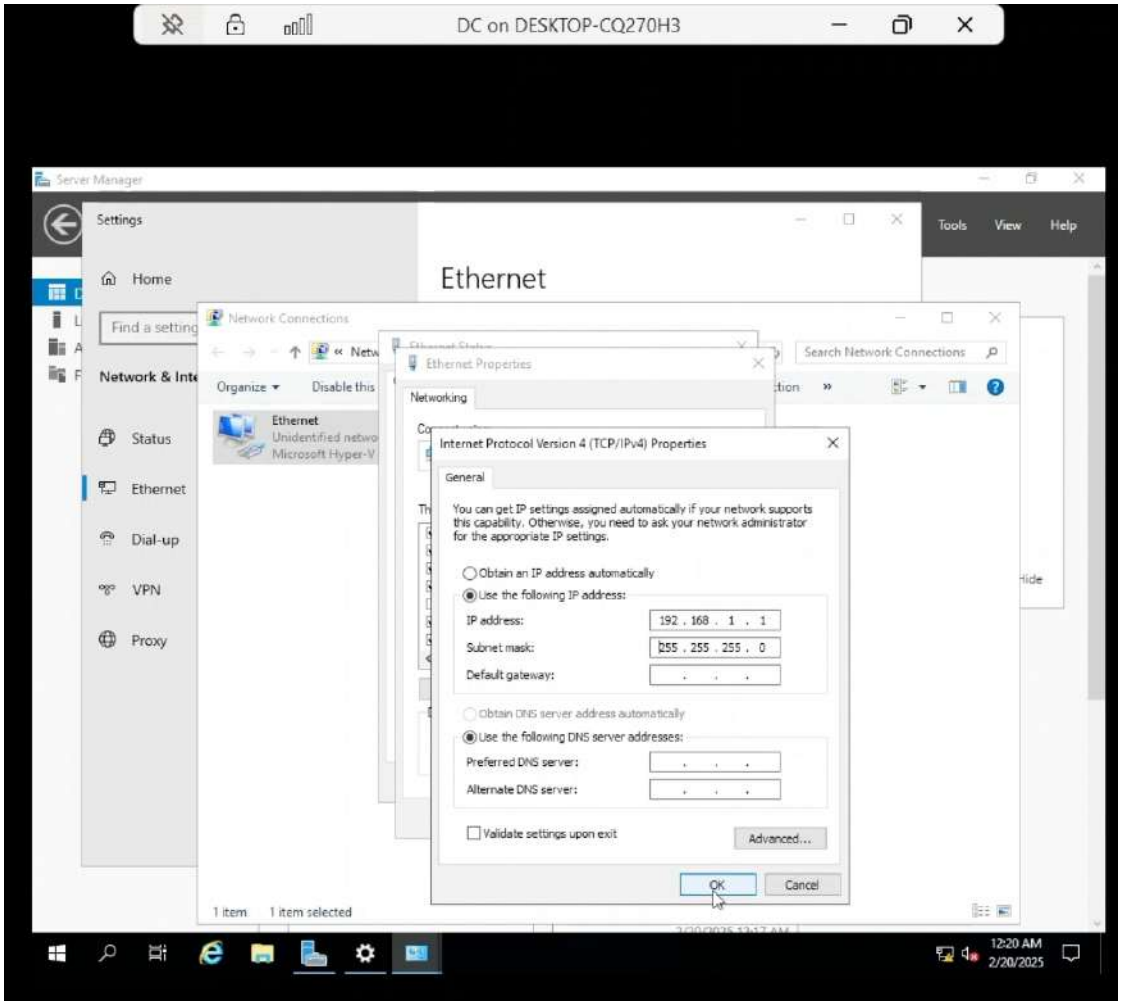
3. Assign Static IP Addresses, Change Computer Name & Test Connectivity

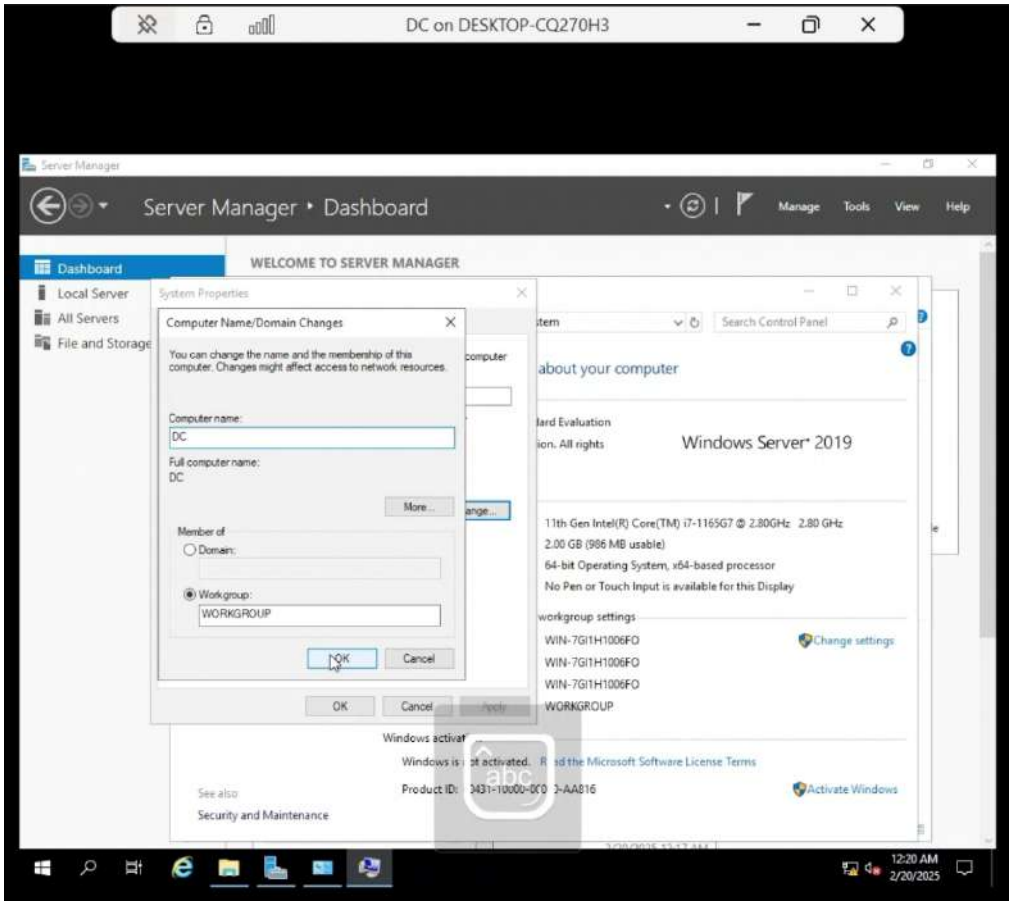
Change computer name and assign **static IP addresses** to all VMs for **reliable communication**:

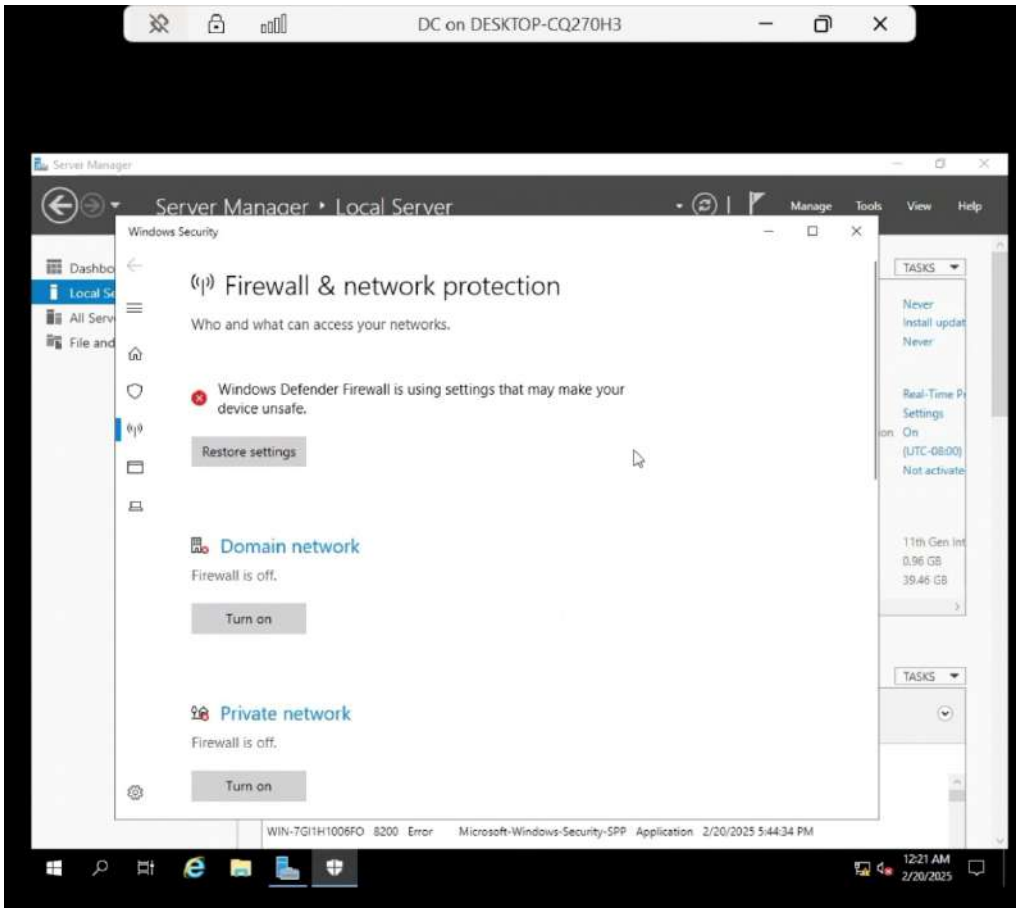
- **DC:** 192.168.1.1
- **FS:** 192.168.1.2
- **CL1:** 192.168.1.10
- **CL2:** 192.168.1.11

Verify **network connectivity** using the **ping** command.

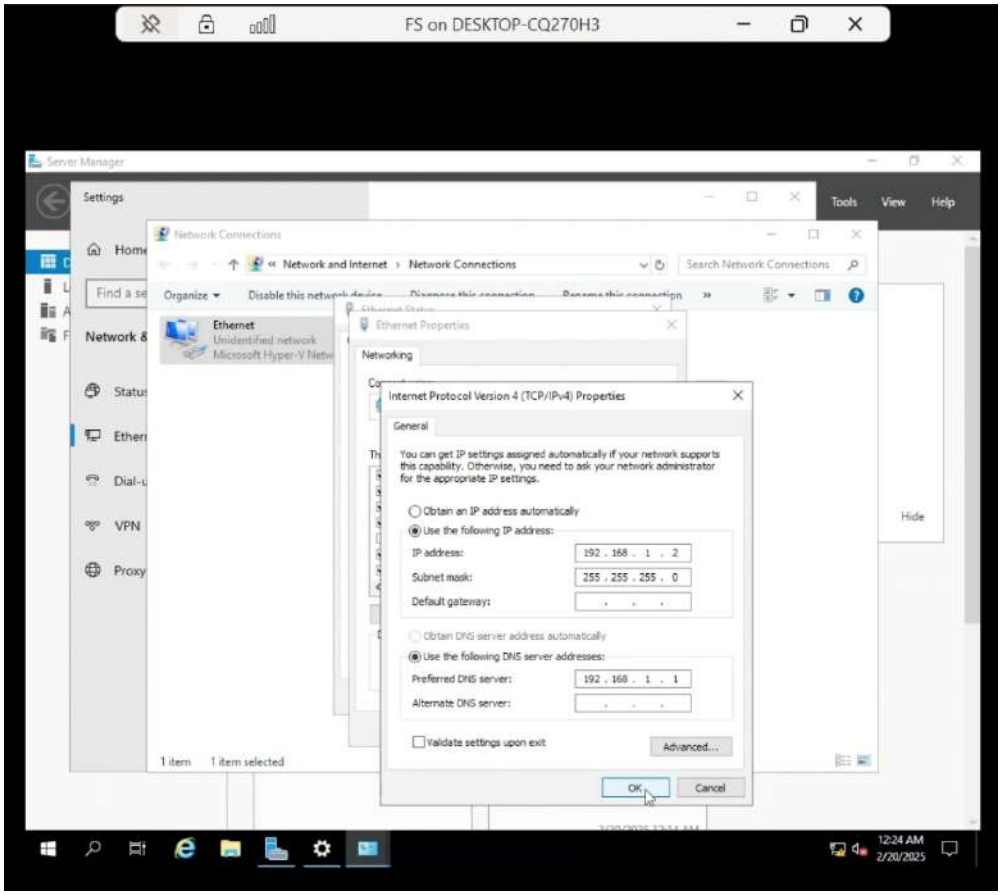
On DC

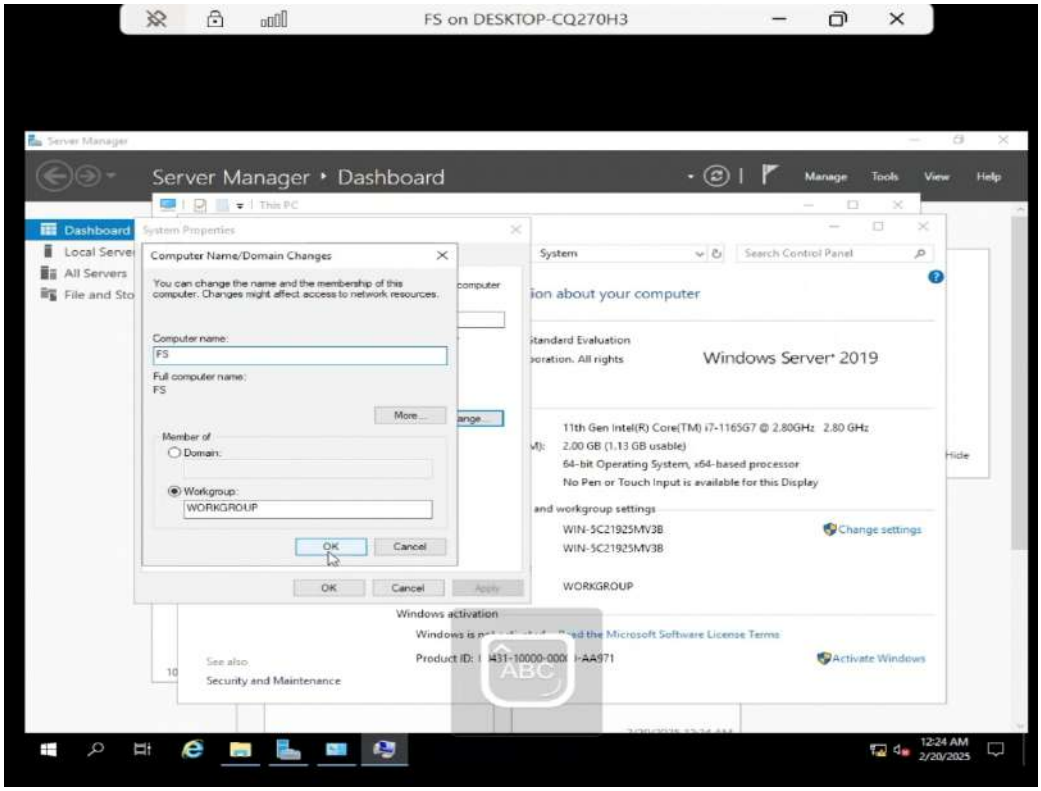


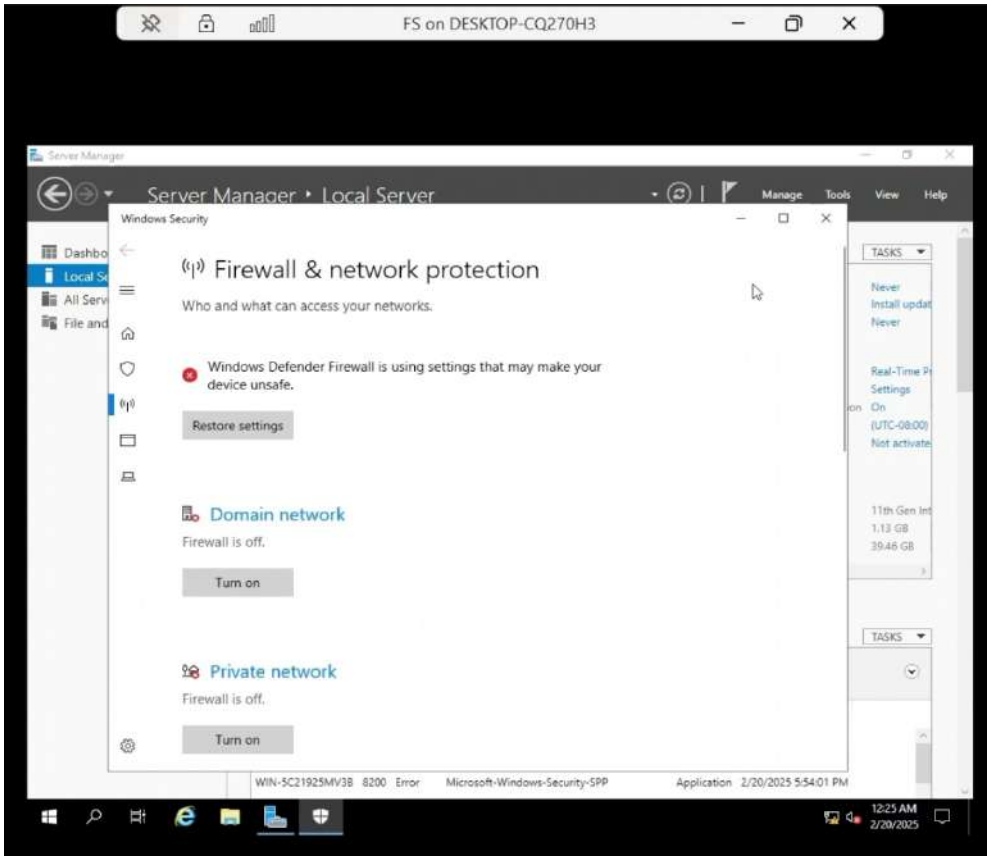

DC on DESKTOP-CQ270H3
Server Manager
Server Manager • Dashboard
Manage
Tools
View
Help
Dashboard
Local Server
All Servers
File and Storage
WELCOME TO SERVER MANAGER
System Properties
Computer Name/Domain Changes
You can change the name and the membership of this computer. Changes might affect access to network resources.
Computer name:
DC
Full computer name:
DC
More...
Member of
Domain:
Workgroup:
WORKGROUP
OK
Cancel
Search Control Panel
about your computer
Windows Server 2019
11th Gen Intel(R) Core(TM) i7-1165G7 @ 2.80GHz 2.80 GHz
2.00 GB (986 MB usable)
64-bit Operating System, x64-based processor
No Pen or Touch Input is available for this Display
workgroup settings
WIN-7GI1H1006FO
Change settings
WORKGROUP
Windows is not activated.
Activate Windows
See also
Security and Maintenance
12:20 AM
2/20/2025


DC on DESKTOP-CQ270H3
Server Manager
Server Manager • Local Server
Manage
Tools
View
Help
Windows Security
Firewall & network protection
Who and what can access your networks.
Windows Defender Firewall is using settings that may make your device unsafe.
Restore settings
Domain network
Firewall is off.
Turn on
Private network
Firewall is off.
Turn on
TASKS
WIN-7GI1H1006FO 8200 Error Microsoft-Windows-Security-SPP Application 2/20/2025 5:44:34 PM
12:21 AM
2/20/2025

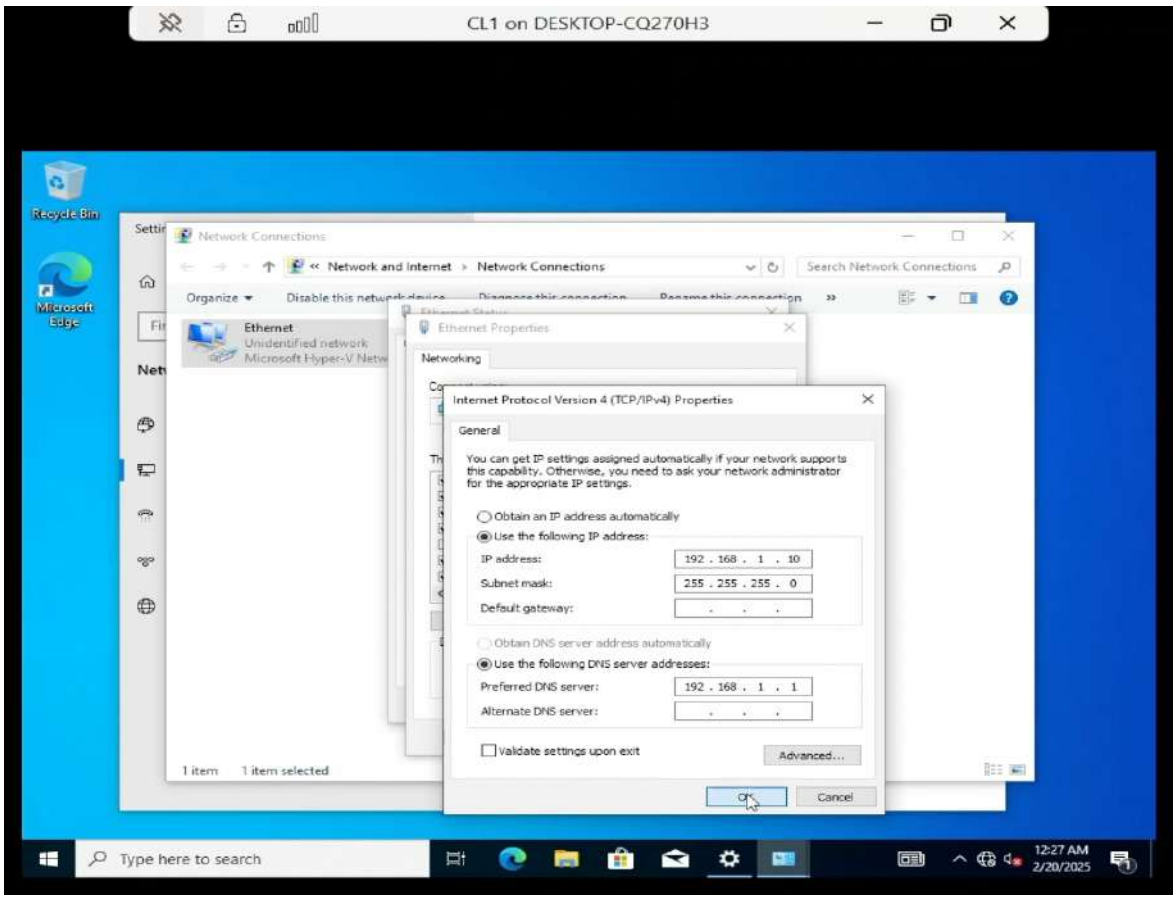
On FS

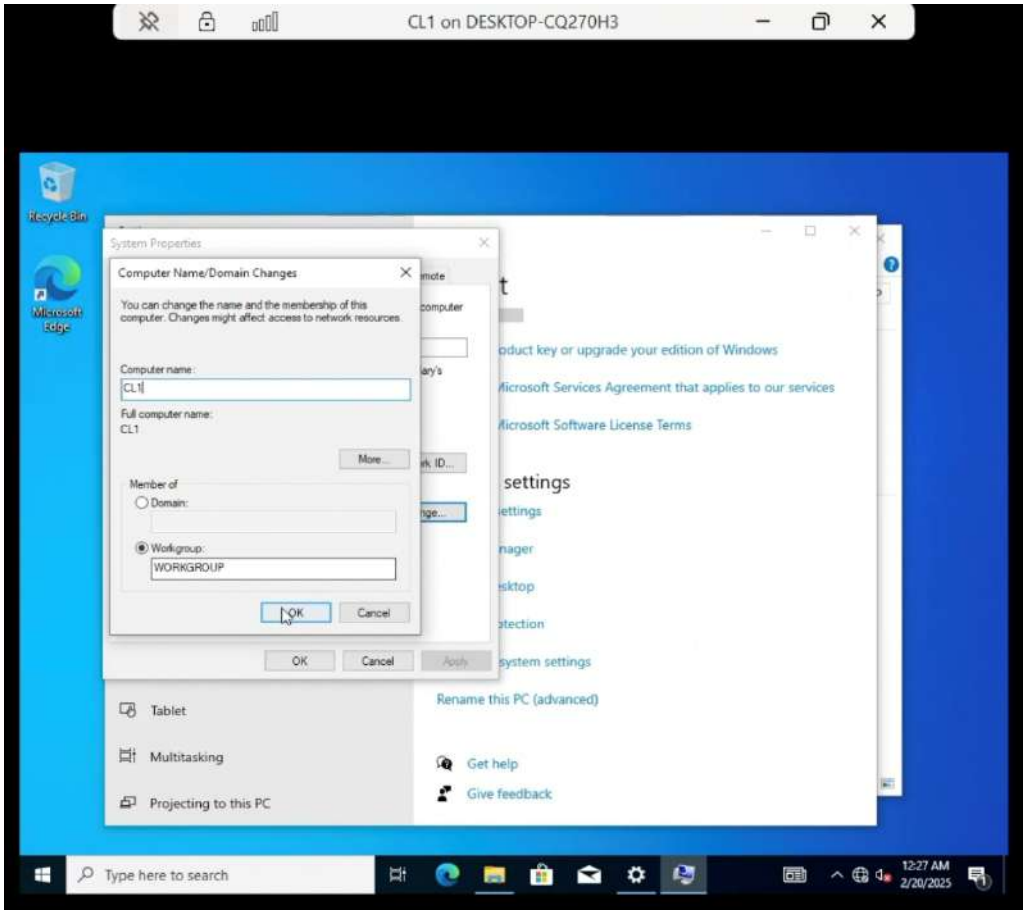

FS on DESKTOP-CQ270H3
Server Manager
Settings
Network Connections
Network and Internet › Network Connections
Ethernet Properties
Networking
Internet Protocol Version 4 (TCP/IPv4) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address: 192 . 168 . 1 . 2
Subnet mask: 255 . 255 . 255 . 0
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server: 192 . 168 . 1 . 1
Alternate DNS server:
Validate settings upon exit
Advanced...
OK
Cancel
1 item
1 item selected
12:24 AM
2/20/2025

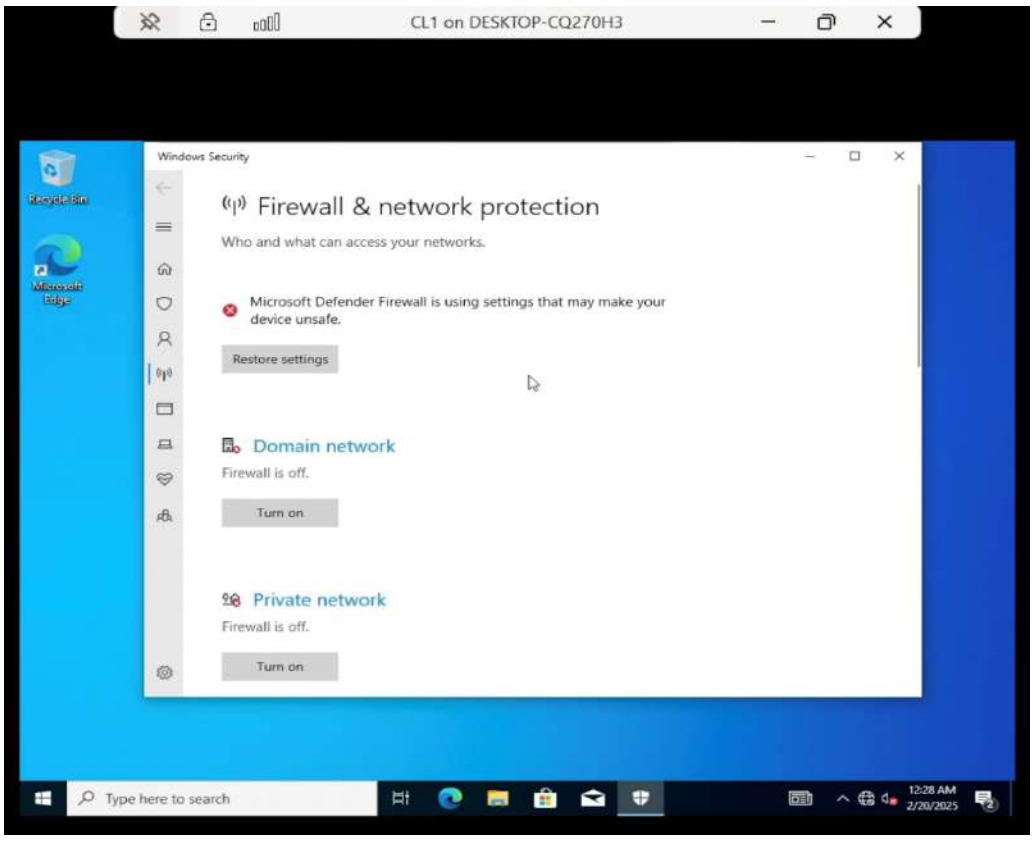

FS on DESKTOP-CQ270H3
Server Manager • Dashboard
Manage
Tools
View
Help
Dashboard
Local Server
All Servers
File and Storage Services
System Properties
Computer Name/Domain Changes
You can change the name and the membership of this computer. Changes might affect access to network resources.
Computer name:
FS
Full computer name:
FS
More...
Member of
Domain:
Workgroup:
WORKGROUP
OK
Cancel
System
Search Control Panel
Windows Server 2019
11th Gen Intel(R) Core(TM) i7-1165G7 @ 2.80GHz 2.80 GHz
2.00 GB (1.13 GB usable)
64-bit Operating System, x64-based processor
No Pen or Touch Input is available for this Display
WIN-5C21925MV3B
Change settings
WORKGROUP
Windows activation
Activate Windows
See also
Security and Maintenance
12:24 AM
2/20/2025


FS on DESKTOP-CQ270H3
Server Manager
Server Manager • Local Server
Manage
Tools
View
Help
Windows Security
Firewall & network protection
Who and what can access your networks.
Windows Defender Firewall is using settings that may make your device unsafe.
Restore settings
Domain network
Firewall is off.
Turn on
Private network
Firewall is off.
Turn on
TASKS
WIN-5C21925MV3B 8200 Error Microsoft-Windows-Security-SPP Application 2/20/2025 5:54:01 PM
12:25 AM
2/20/2025

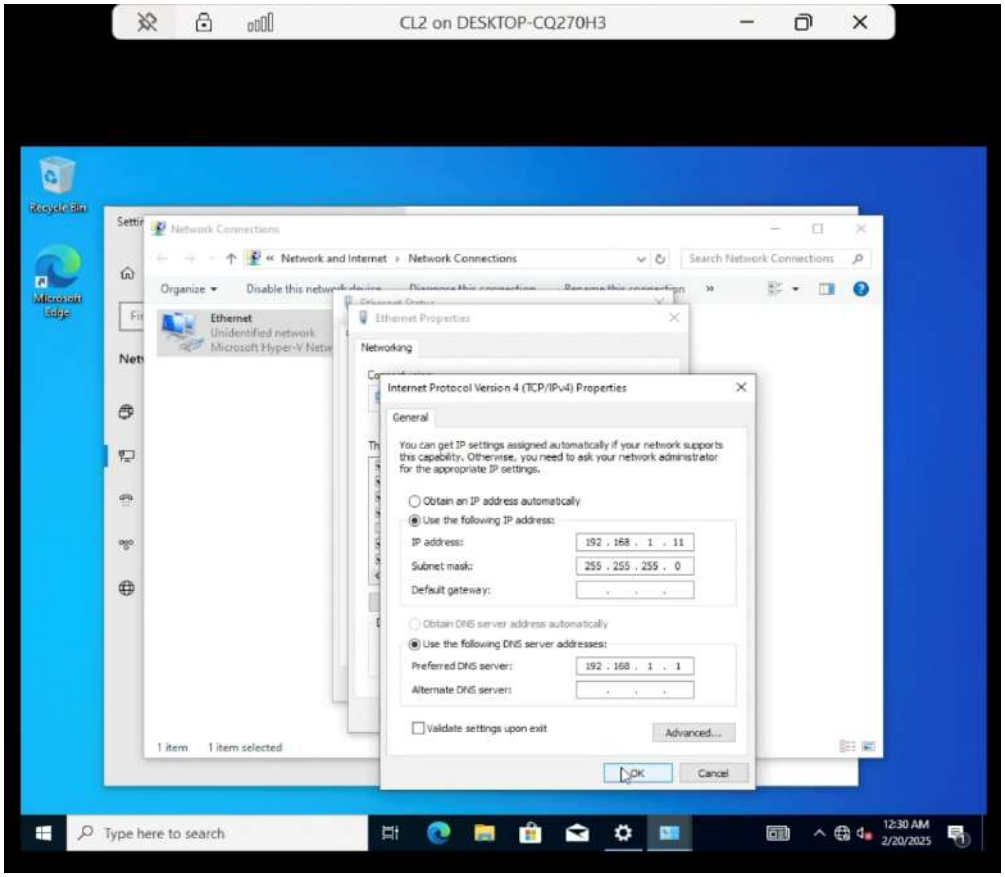
On CL1

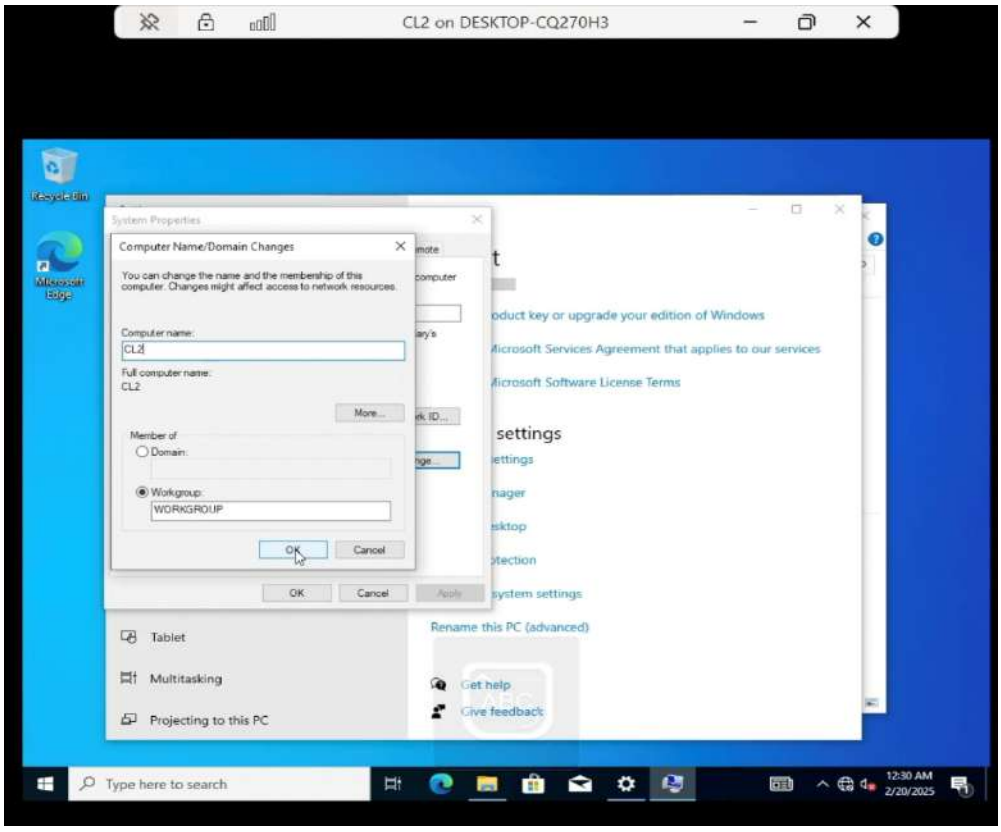

CL1 on DESKTOP-CQ270H3
Recycle Bin
Microsoft Edge
Network Connections
Network and Internet • Network Connections
Search Network Connections
Organize
Disable this network device
Ethernet
Unidentified network
Microsoft Hyper-V Network
Ethernet Properties
Networking
Internet Protocol Version 4 (TCP/IPv4) Properties
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: 192 . 168 . 1 . 10
Subnet mask: 255 . 255 . 255 . 0
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server: 192 . 168 . 1 . 1
Alternate DNS server:
Validate settings upon exit
Advanced...
OK
Cancel
1 item
1 item selected
Type here to search
12:27 AM
2/20/2025

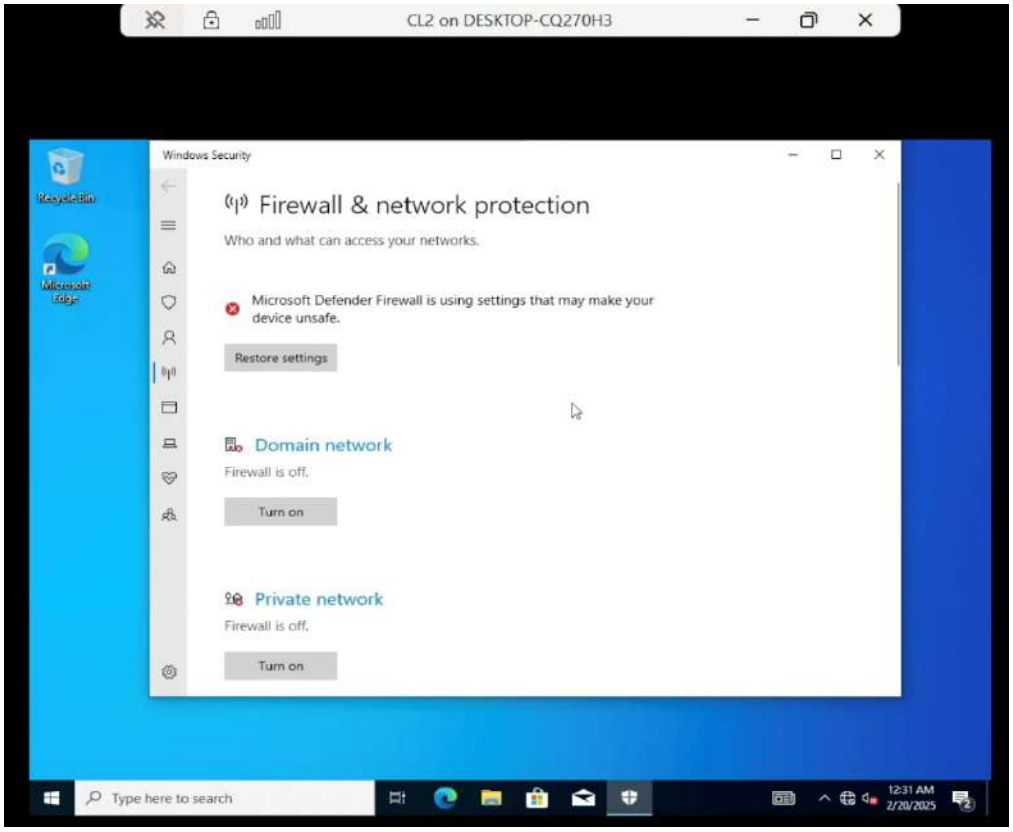

CL1 on DESKTOP-CQ270H3
Recycle Bin
Microsoft Edge
System Properties
Computer Name/Domain Changes
You can change the name and the membership of this computer. Changes might affect access to network resources.
Computer name:
CL1
Full computer name:
CL1
More...
Member of
Domain:
Workgroup:
WORKGROUP
OK
Cancel
OK
Cancel
Apply
Tablet
Multitasking
Projecting to this PC
Rename this PC (advanced)
Get help
Give feedback
Type here to search
12:27 AM
2/20/2025


CL1 on DESKTOP-CQ270H3
Recycle Bin
Microsoft Edge
Windows Security
Firewall & network protection
Who and what can access your networks.
Microsoft Defender Firewall is using settings that may make your device unsafe.
Restore settings
Domain network
Firewall is off.
Turn on
Private network
Firewall is off.
Turn on
Type here to search
12:28 AM
2/20/2025

On CL2

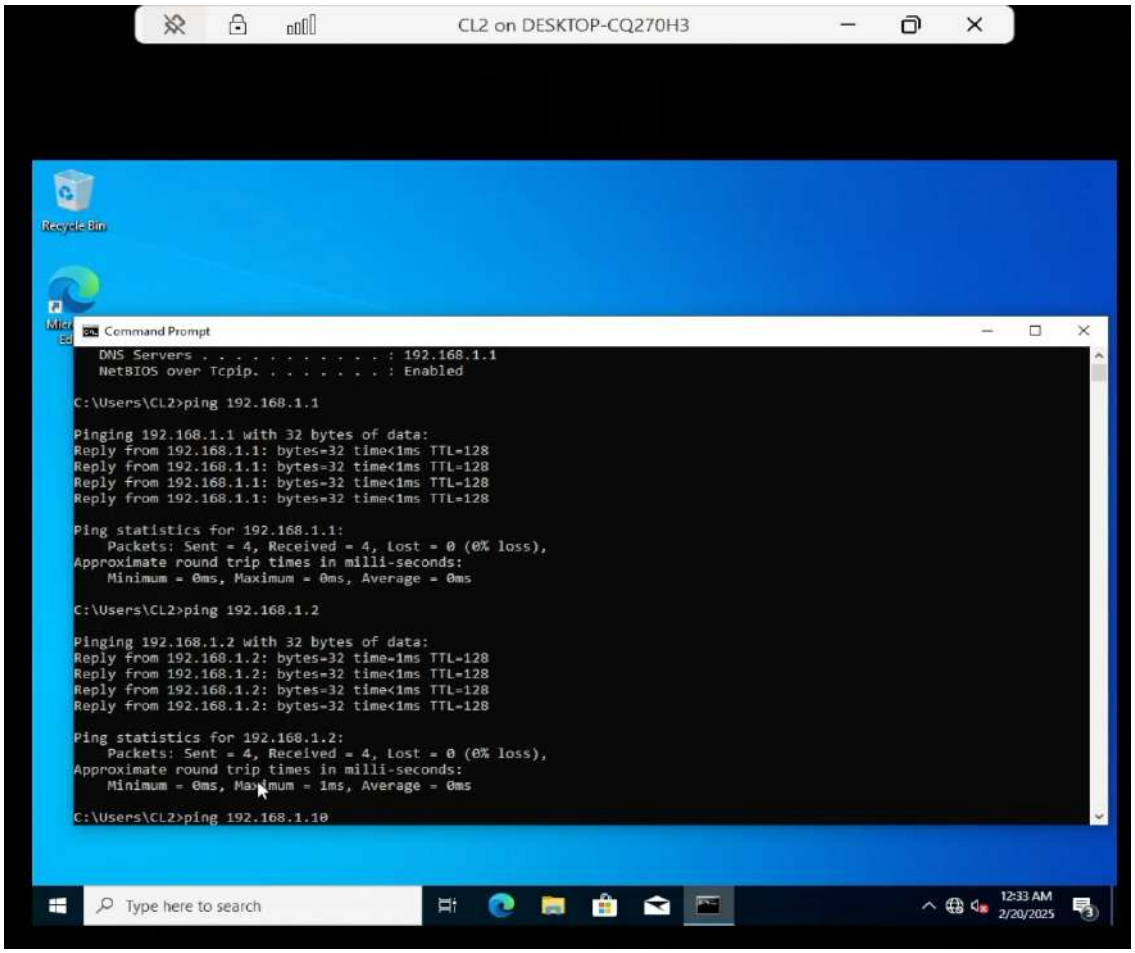

CL2 on DESKTOP-CQ270H3
Recycle Bin
Microsoft Edge
Network Connections
Network and Internet › Network Connections
Search Network Connections
Organize
Disable this network device
Ethernet
Unidentified network
Microsoft Hyper-V Network
Ethernet Properties
Networking
Internet Protocol Version 4 (TCP/IPv4) Properties
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: 192 . 168 . 1 . 11
Subnet mask: 255 . 255 . 255 . 0
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server: 192 . 168 . 1 . 1
Alternate DNS server:
Validate settings upon exit
Advanced...
OK
Cancel
1 item
1 item selected
Type here to search
12:30 AM
2/20/2025


CL2 on DESKTOP-CQ270H3
Recycle Bin
Microsoft Edge
System Properties
Computer Name/Domain Changes
You can change the name and the membership of this computer. Changes might affect access to network resources.
Computer name:
CL2
Full computer name:
CL2
More...
Member of
Domain:
Workgroup:
WORKGROUP
OK
Cancel
Tablet
Multitasking
Projecting to this PC
oduct key or upgrade your edition of Windows
Microsoft Services Agreement that applies to our services
Microsoft Software License Terms
settings
Rename this PC (advanced)
Get help
Give feedback
Type here to search
12:30 AM
2/20/2025


CL2 on DESKTOP-CQ270H3
Recycle Bin
Microsoft Edge
Windows Security
Firewall & network protection
Who and what can access your networks.
Microsoft Defender Firewall is using settings that may make your device unsafe.
Restore settings
Domain network
Firewall is off.
Turn on
Private network
Firewall is off.
Turn on
Type here to search
12:31 AM
2/20/2025

Verify network connectivity between machines.

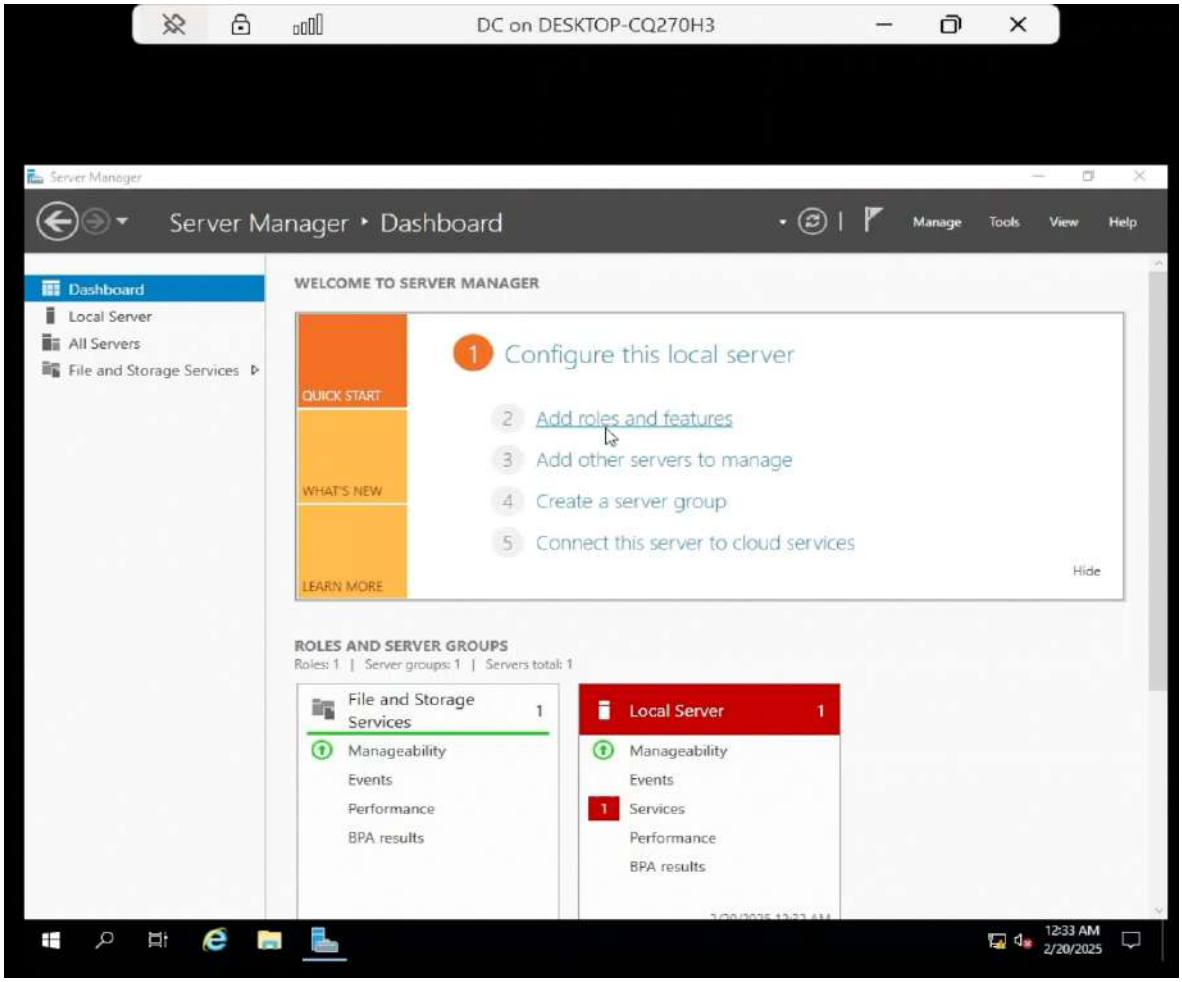
Use the ping command to verify that all machines can connect to each other within the network.

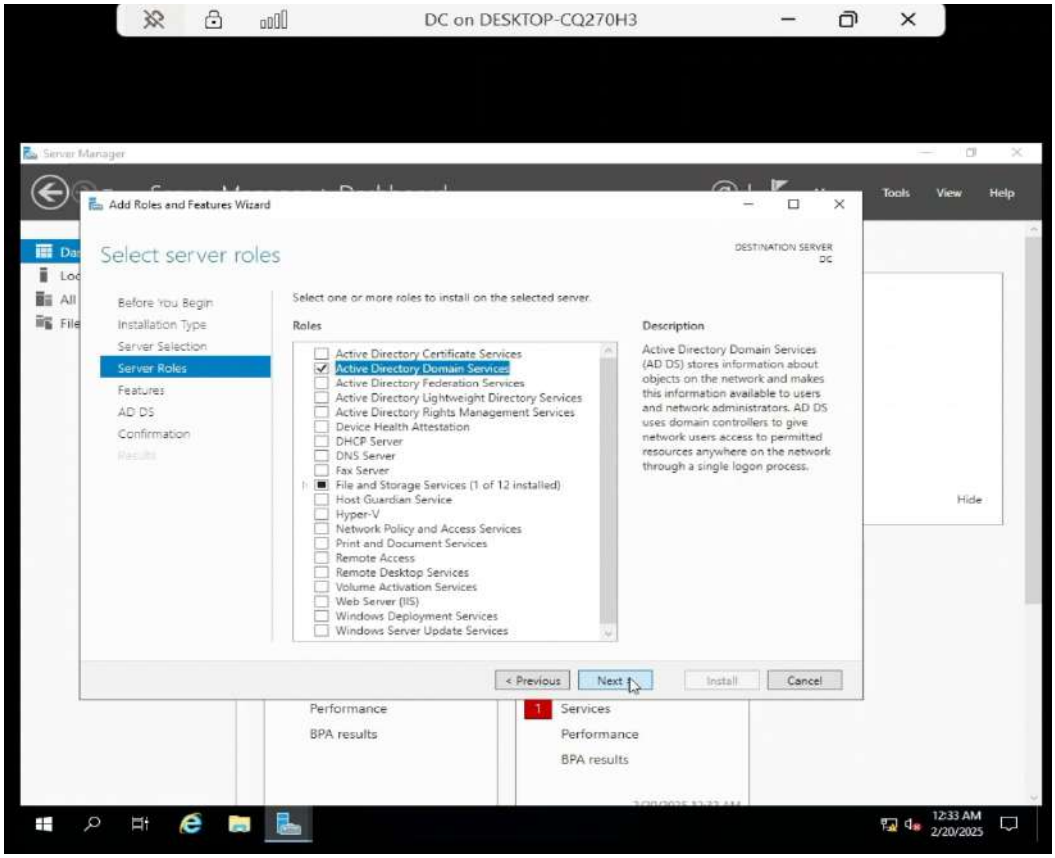


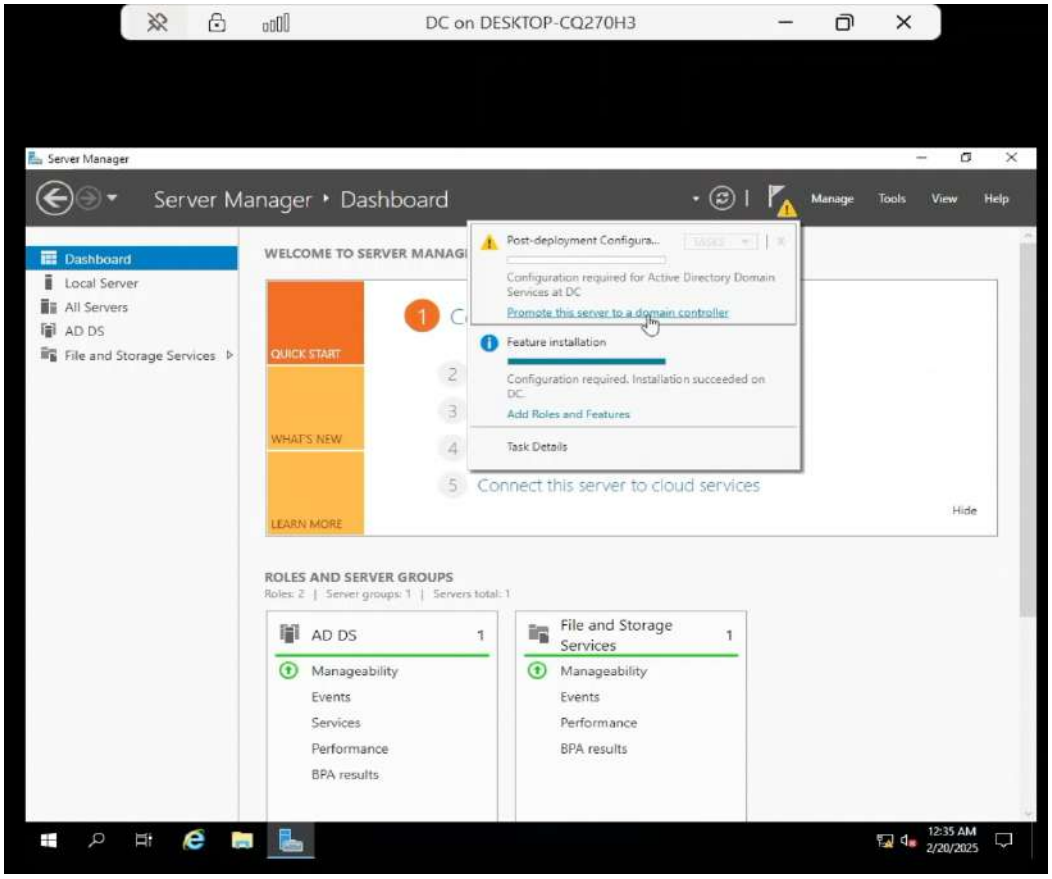
4. Deploy Active Directory Domain Services (AD DS)

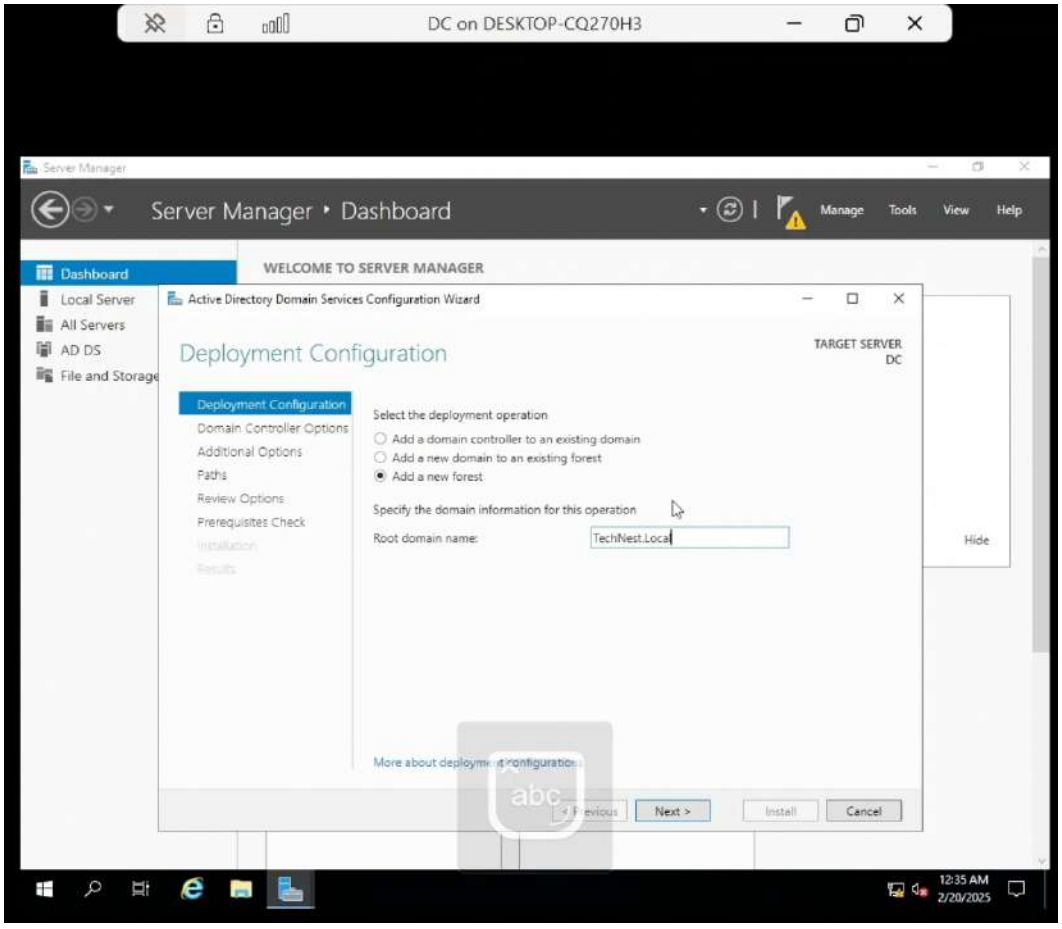
Active Directory (AD) is a centralized directory that helps manage users, computers, and network resources.

a. We will install and configure Active Directory Domain Services (AD DS) on the Domain Controller.
b. A new domain (e.g., TechNest.local) will be created, and the server will be promoted to a Domain Controller.


DC on DESKTOP-CQ270H3
Server Manager
Server Manager • Dashboard
Manage
Tools
View
Help
Dashboard
Local Server
All Servers
File and Storage Services
WELCOME TO SERVER MANAGER
QUICK START
WHAT'S NEW
LEARN MORE
1 Configure this local server
2 Add roles and features
3 Add other servers to manage
4 Create a server group
5 Connect this server to cloud services
Hide
ROLES AND SERVER GROUPS
Roles: 1 | Server groups: 1 | Servers total: 1
File and Storage Services 1
Manageability
Events
Performance
BPA results
Local Server 1
Manageability
Events
Services
Performance
BPA results
12:33 AM
2/20/2025


DC on DESKTOP-CQ270H3
Add Roles and Features Wizard
Select server roles
DESTINATION SERVER
DC
Before You Begin
Installation Type
Server Selection
Server Roles
Features
AD DS
Confirmation
Results
Select one or more roles to install on the selected server.
Roles
Active Directory Certificate Services
Active Directory Domain Services
Active Directory Federation Services
Active Directory Lightweight Directory Services
Active Directory Rights Management Services
Device Health Attestation
DHCP Server
DNS Server
Fax Server
File and Storage Services (1 of 12 installed)
Host Guardian Service
Hyper-V
Network Policy and Access Services
Print and Document Services
Remote Access
Remote Desktop Services
Volume Activation Services
Web Server (IIS)
Windows Deployment Services
Windows Server Update Services
Description
Active Directory Domain Services (AD DS) stores information about objects on the network and makes this information available to users and network administrators. AD DS uses domain controllers to give network users access to permitted resources anywhere on the network through a single logon process.
< Previous
Next >
Install
Cancel
Performance
BPA results
Services
Performance
BPA results
12:33 AM
2/20/2025


DC on DESKTOP-CQ270H3
Server Manager
Server Manager • Dashboard
Manage
Tools
View
Help
Dashboard
Local Server
All Servers
AD DS
File and Storage Services
WELCOME TO SERVER MANAGE
QUICK START
WHAT'S NEW
LEARN MORE
Post-deployment Configura...
Configuration required for Active Directory Domain Services at DC
Promote this server to a domain controller
Feature installation
Configuration required. Installation succeeded on DC.
Add Roles and Features
Task Details
Connect this server to cloud services
Hide
ROLES AND SERVER GROUPS
Roles: 2 | Server groups: 1 | Servers total: 1
AD DS
1
Manageability
Events
Services
Performance
BPA results
File and Storage Services
1
Manageability
Events
Performance
BPA results
12:35 AM
2/20/2025


DC on DESKTOP-CQ270H3
Server Manager
Server Manager • Dashboard
Manage
Tools
View
Help
Dashboard
Local Server
All Servers
AD DS
File and Storage
WELCOME TO SERVER MANAGER
Active Directory Domain Services Configuration Wizard
Deployment Configuration
TARGET SERVER
DC
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:
TechNest.Local
More about deployment configurations
< Previous
Next >
Install
Cancel
Hide
12:35 AM
2/20/2025

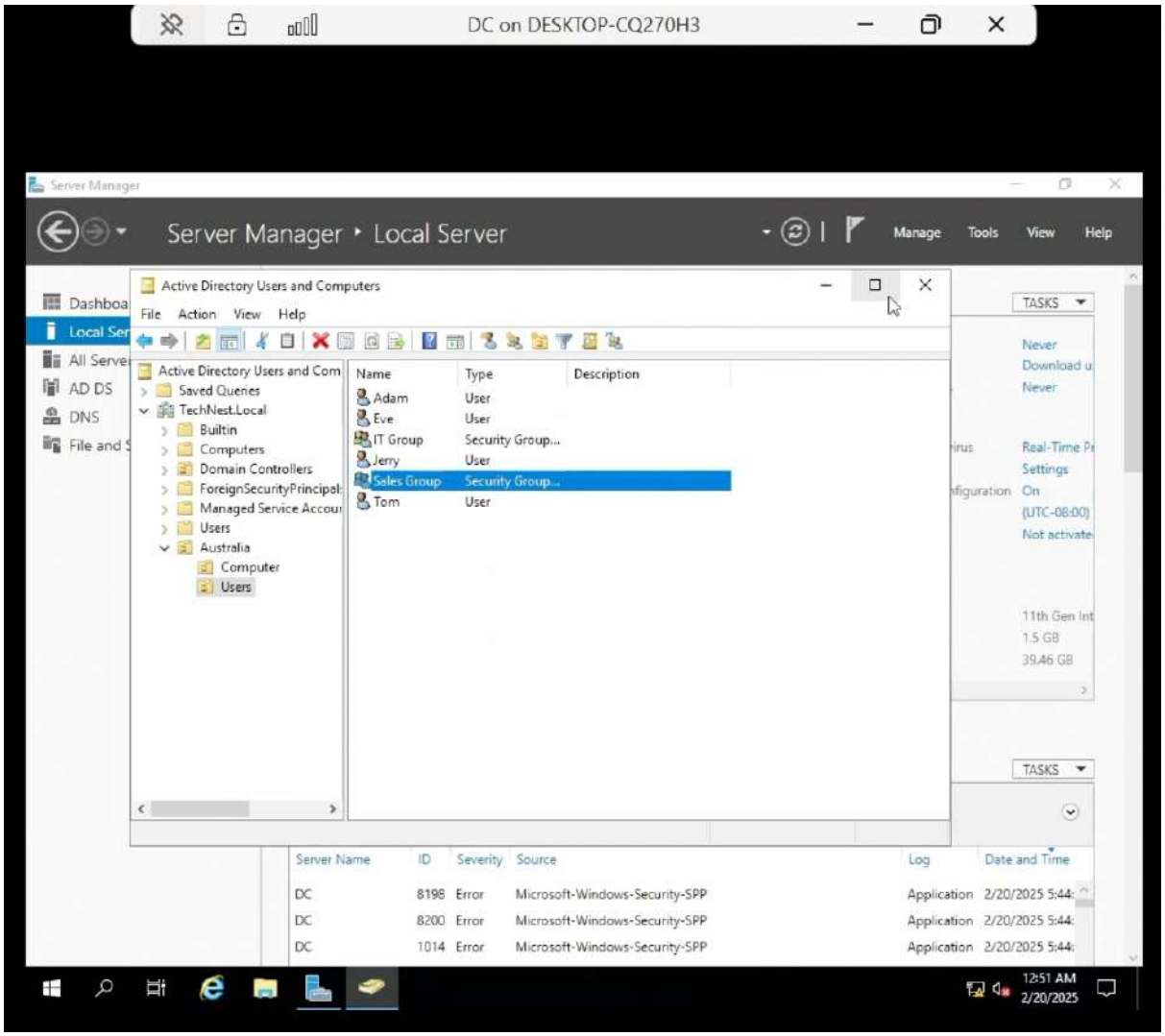
5. Create Organizational Units (OUs), Sub-OUs, User Accounts & Security Groups

c. Organize Active Directory structure:
   i. **OU (e.g., Australia)**
   ii. **Sub-OUs (e.g., Users, Computers)**

d. Add users (e.g., **Tom, Jerry, Adam, Eve**).

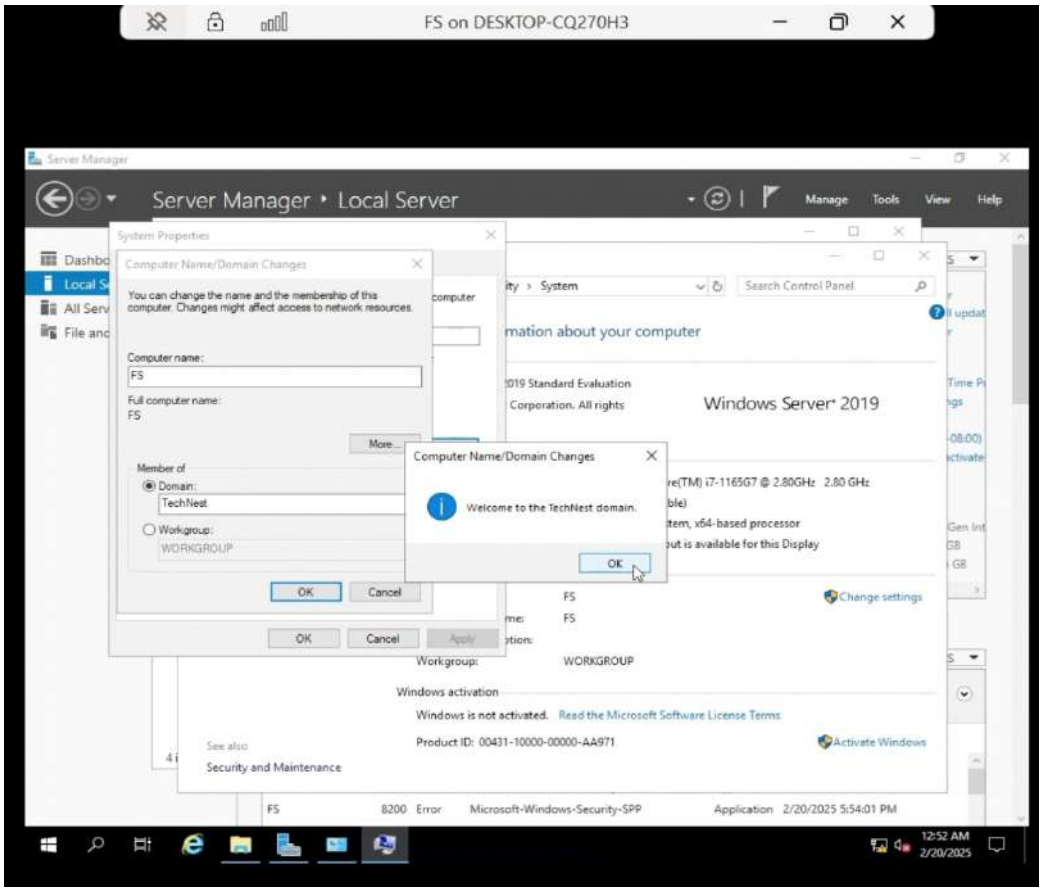
e. Create security groups (e.g., **IT Group, Sales Group**).

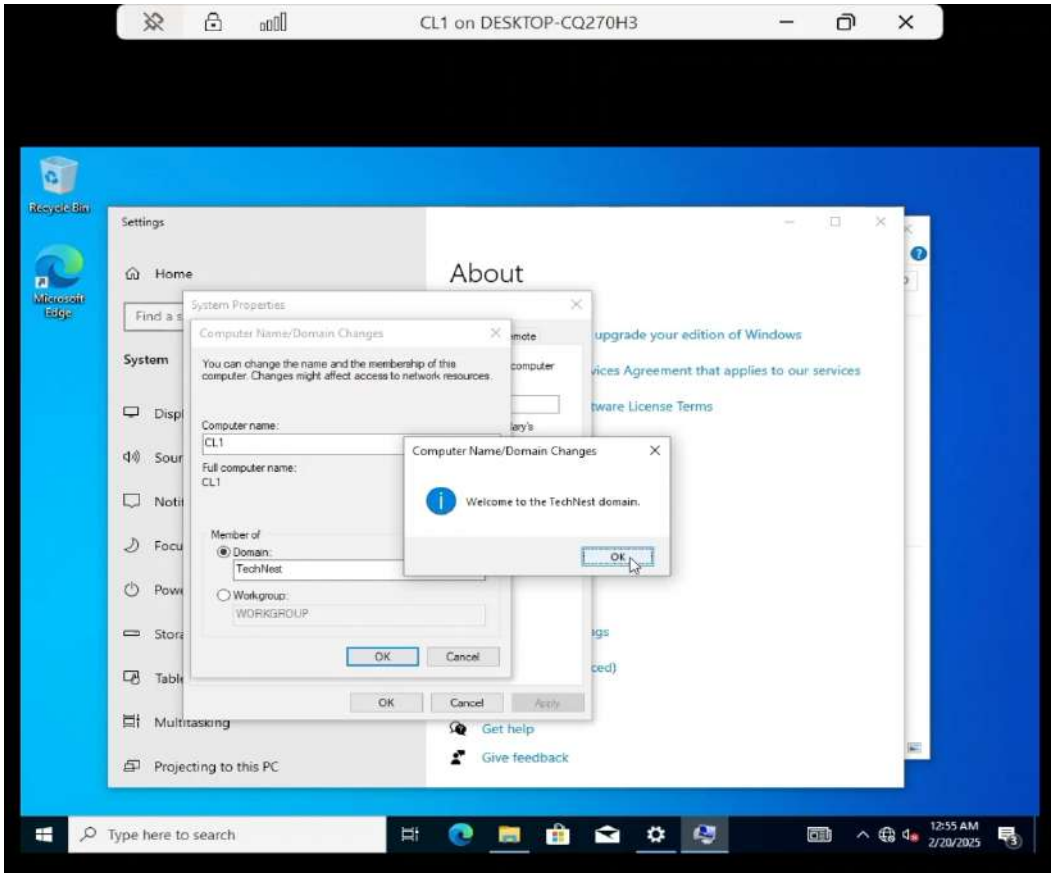
f. Add users to a security groups (e.g., **Add Tom, Jerry in IT Group, Add Adam, Eve in Sales Group**).

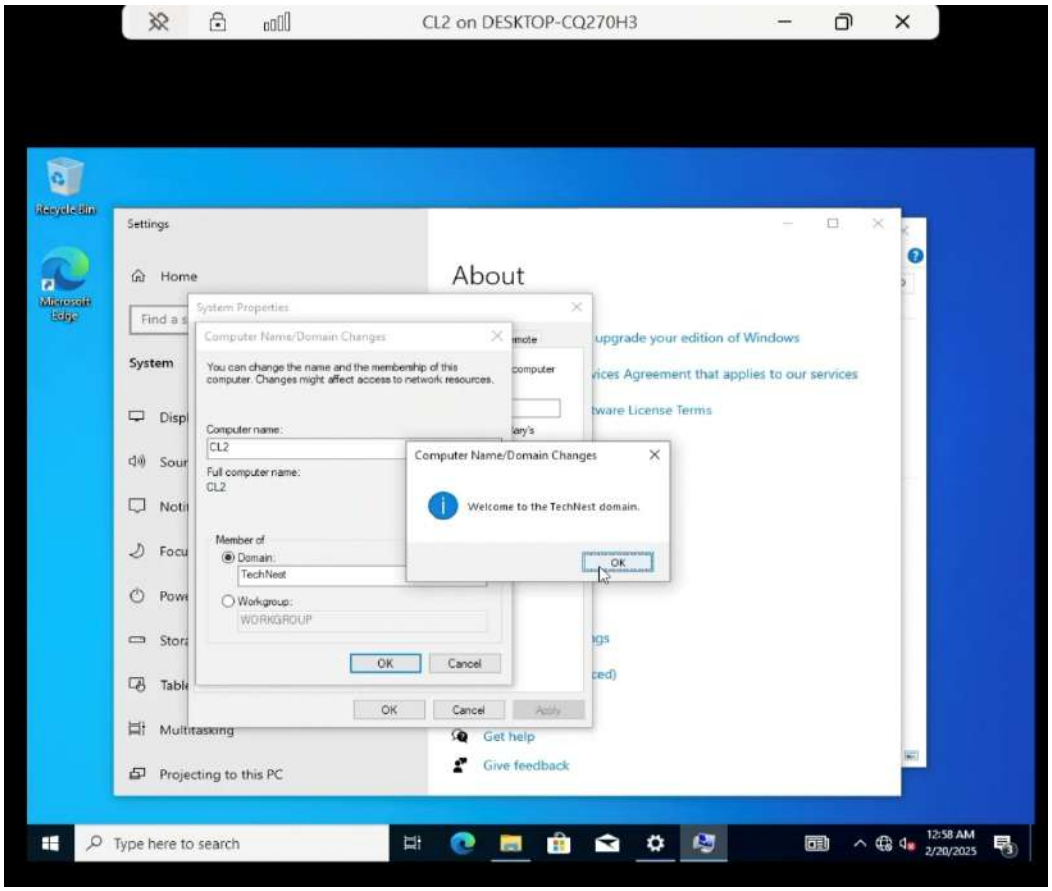


6. Join File Server (FS) and Client PCs (CL1, CL2) to the Domain from Workgroup

Connect the **File Server (FS)** and **Client PCs (CL1 & CL2)** to the **TechNest.local domain**.




CL1 on DESKTOP-CQ270H3
Recycle Bin
Microsoft Edge
Settings
Home
About
System
Computer Name/Domain Changes
You can change the name and the membership of this computer. Changes might affect access to network resources.
Computer name:
CL1
Full computer name:
CL1
Member of
Domain:
TechNest
Workgroup:
WORKGROUP
OK
Cancel
Computer Name/Domain Changes
Welcome to the TechNest domain.
OK
Multitasking
Projecting to this PC
Get help
Give feedback
upgrade your edition of Windows
Type here to search
12:55 AM
2/20/2025


CL2 on DESKTOP-CQ270H3
Recycle Bin
Microsoft Edge
Settings
Home
About
System
Computer Name/Domain Changes
You can change the name and the membership of this computer. Changes might affect access to network resources.
Computer name:
CL2
Full computer name:
CL2
Member of
Domain:
TechNest
Workgroup:
WORKGROUP
OK
Cancel
Computer Name/Domain Changes
Welcome to the TechNest domain.
OK
Multitasking
Projecting to this PC
Get help
Give feedback
upgrade your edition of Windows
Type here to search
12:58 AM
2/20/2025

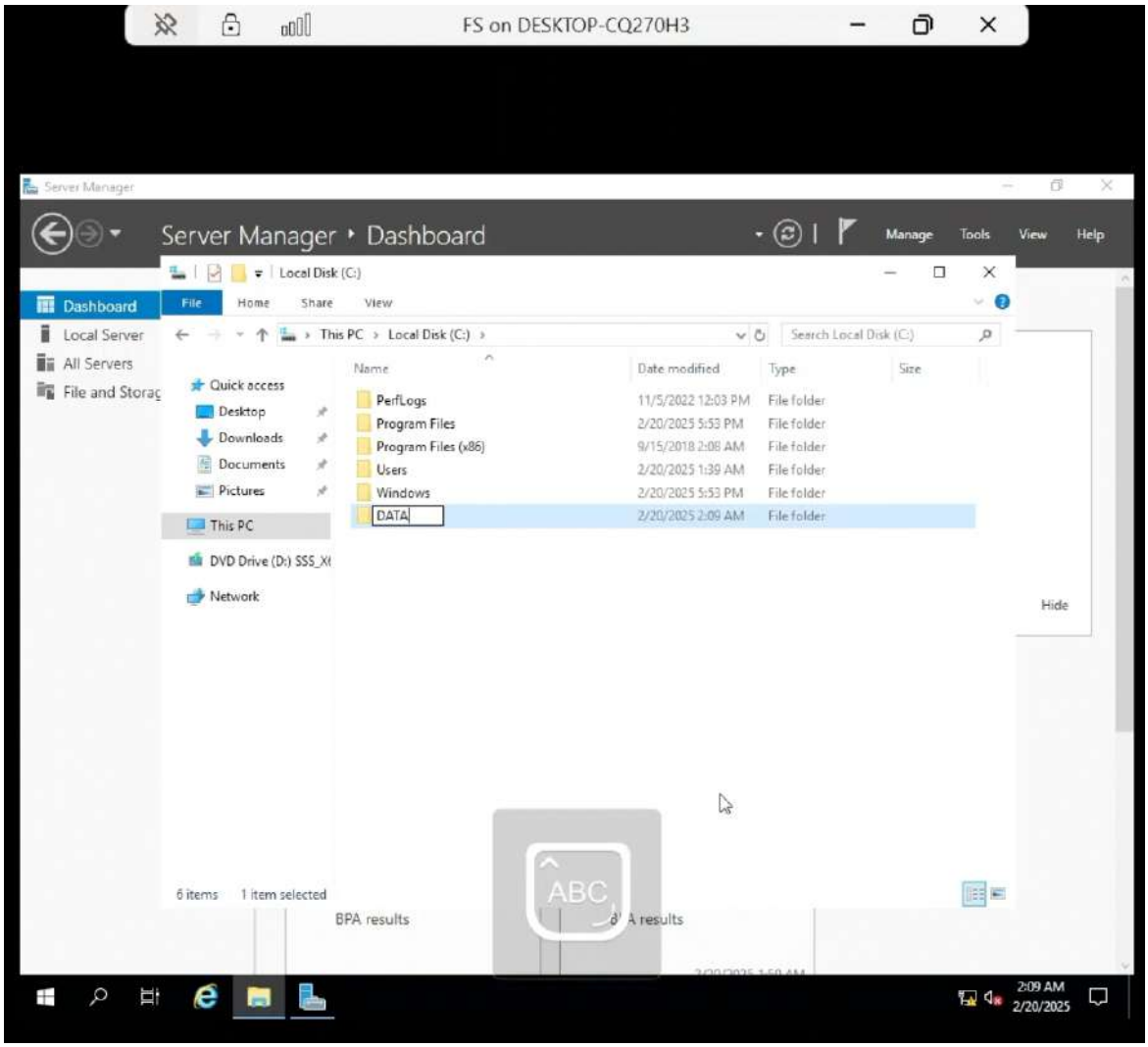
7. Configure Folder Structure on File Server

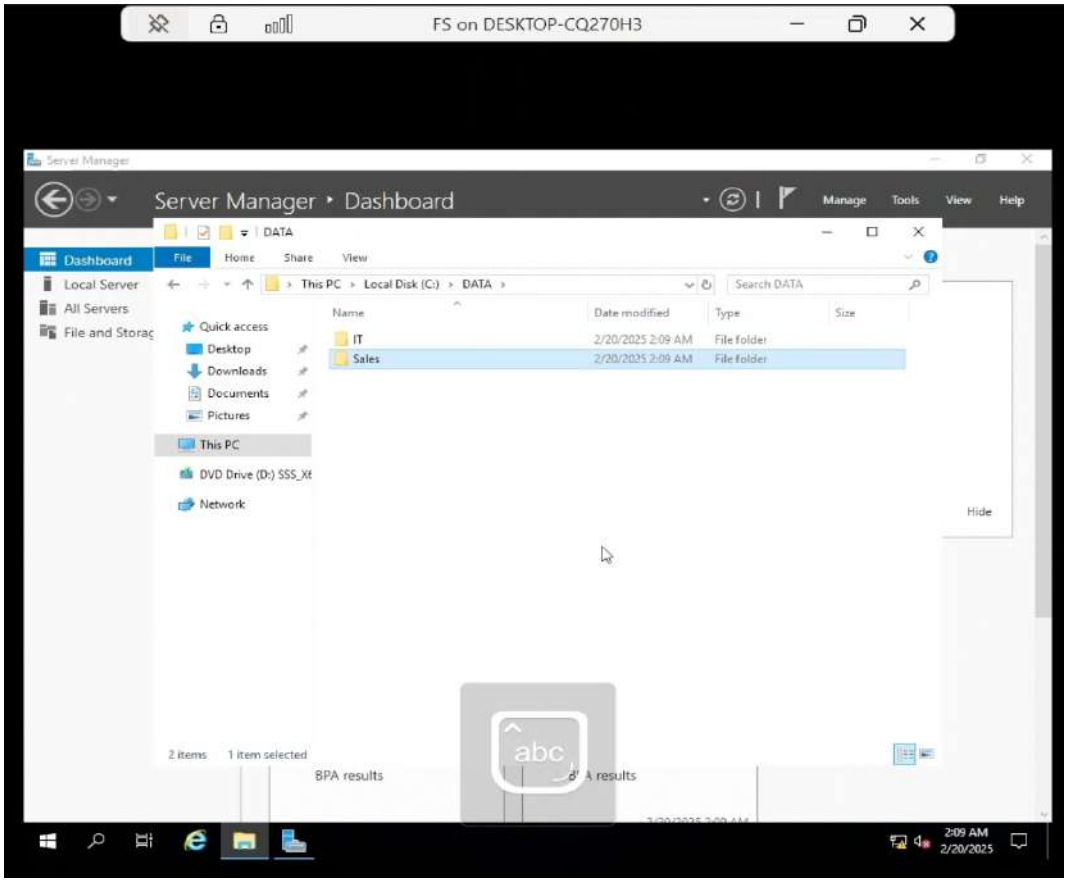
Setting up a well-organized folder structure on the File Server (FS) is crucial for efficient data management, security, and user access control. By creating a shared DATA folder with subfolders (e.g., IT, Sales), administrators can centralize file storage, making it easier for teams to collaborate.

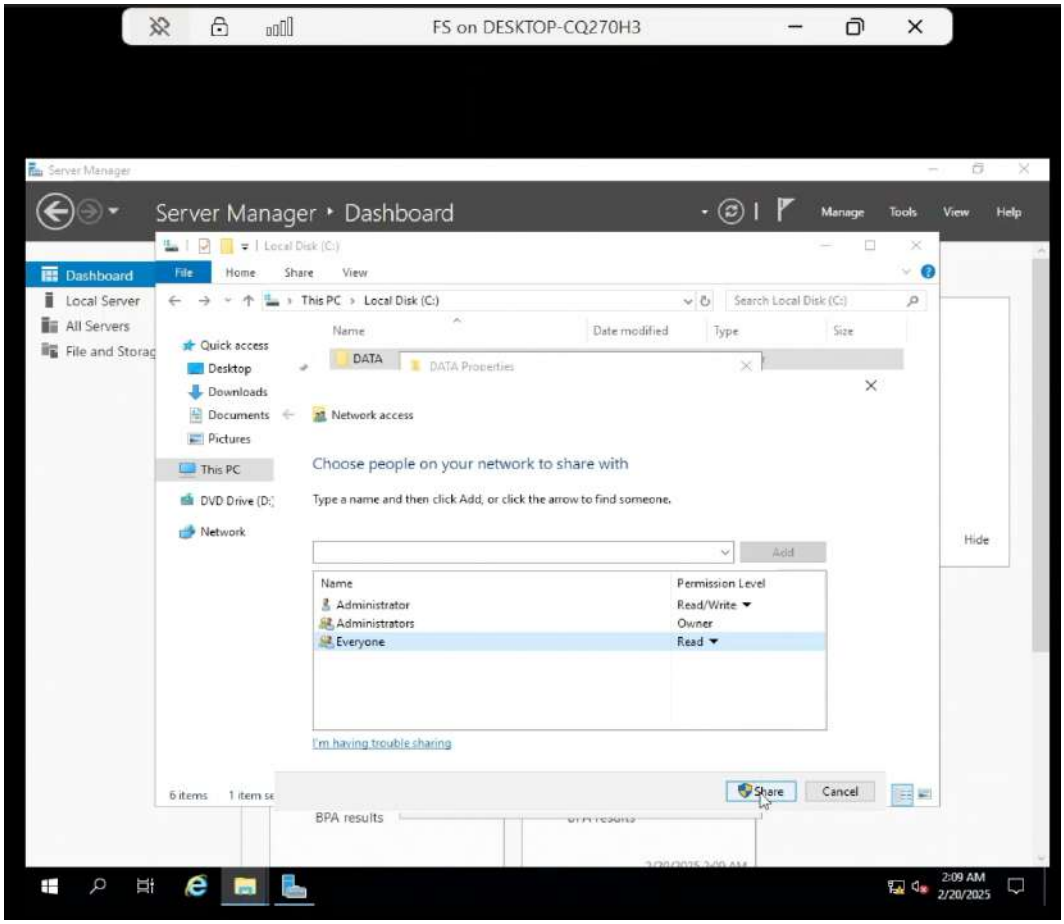
Applying NTFS permissions ensures that only authorized users or groups can access specific files, while Access-Based Enumeration (ABE) hides folders from users who don't have permission, enhancing security and user experience. This setup also simplifies backup management and reduces the risk of data loss.

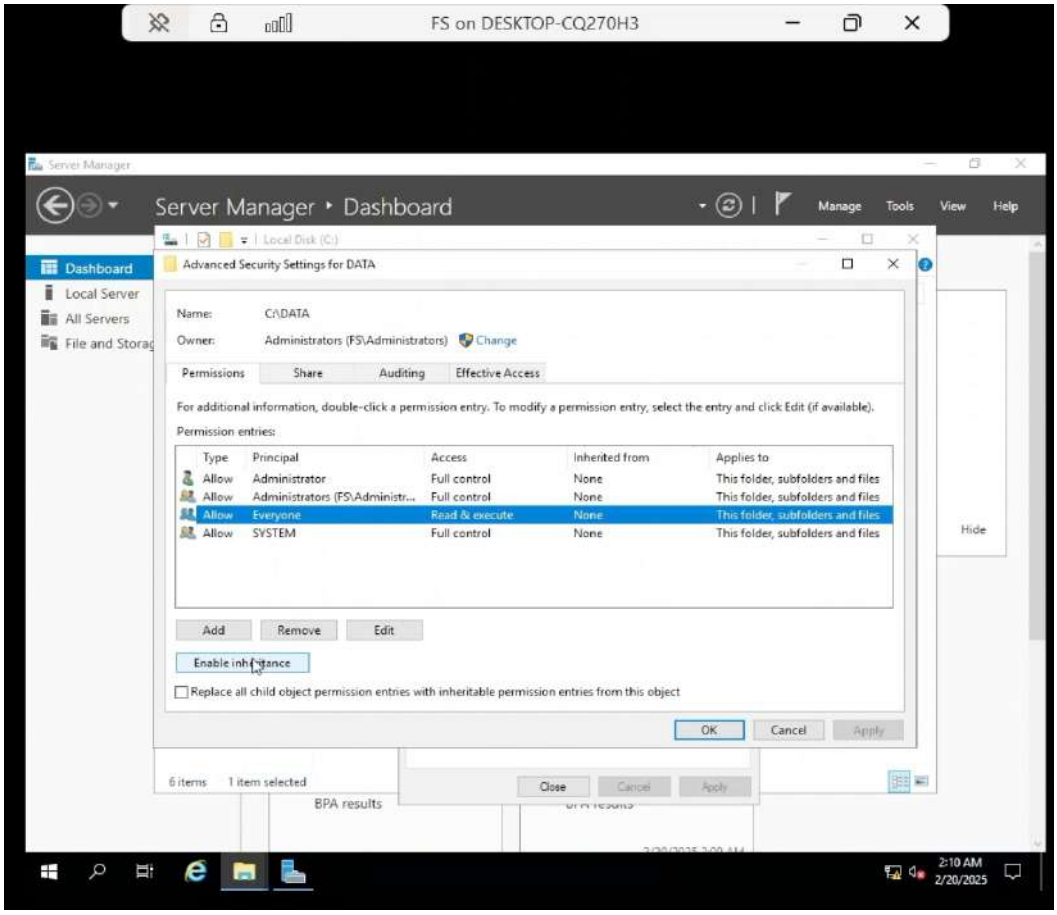
A structured file-sharing system is essential for maintaining data integrity, security, and accessibility in any IT environment.

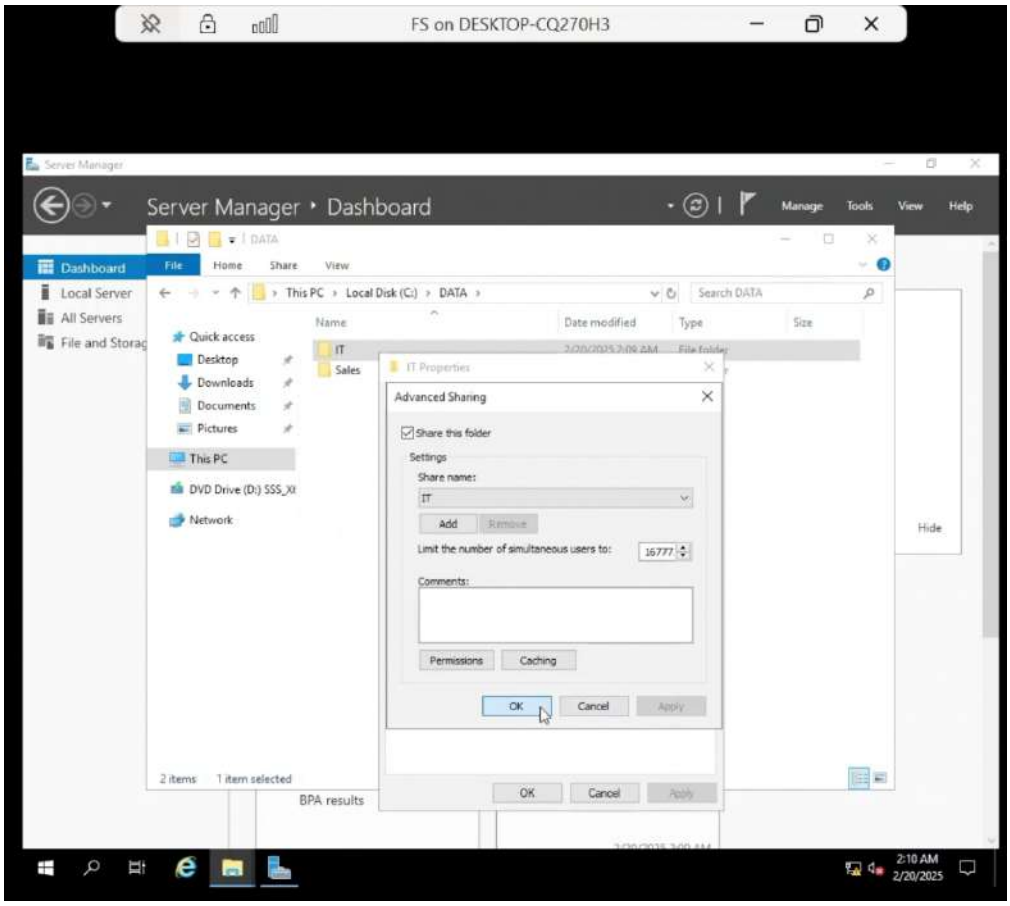
g. Create a shared data folder (e.g., DATA) with subfolders (e.g., IT, Sales).
h. Enable sharing & apply NTFS permissions.
i. Enable Access-Based Enumeration (ABE).

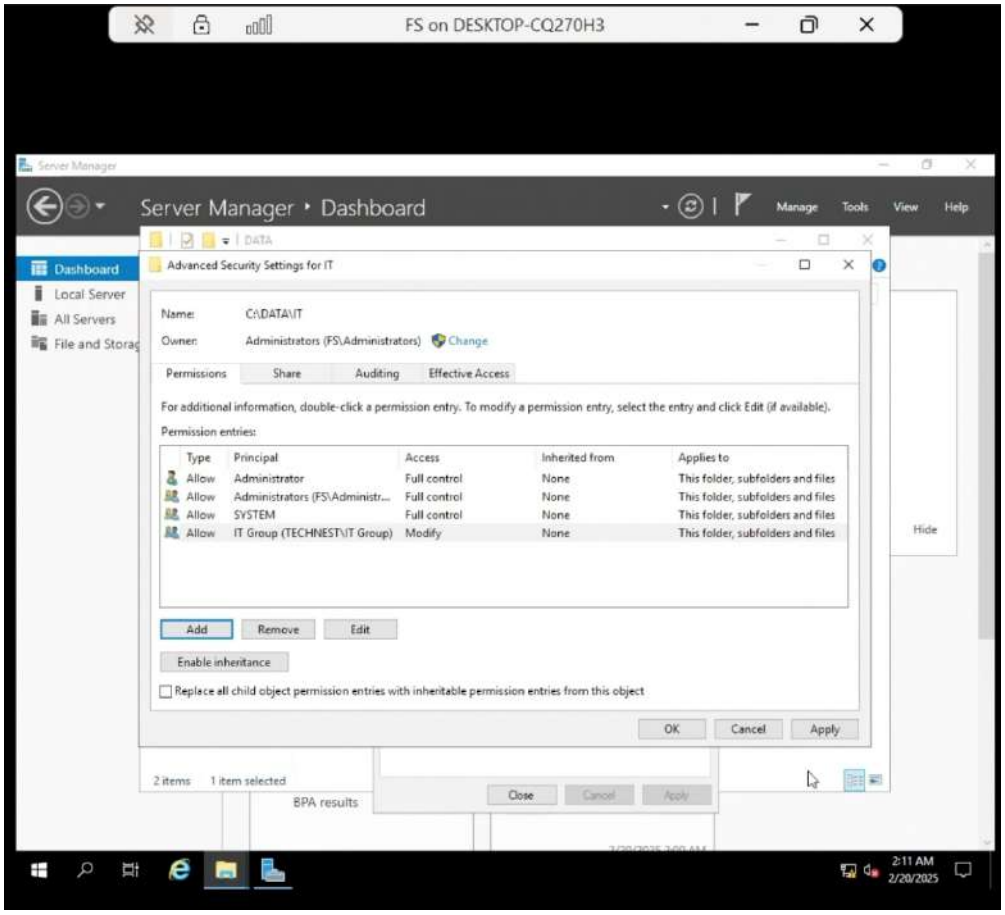


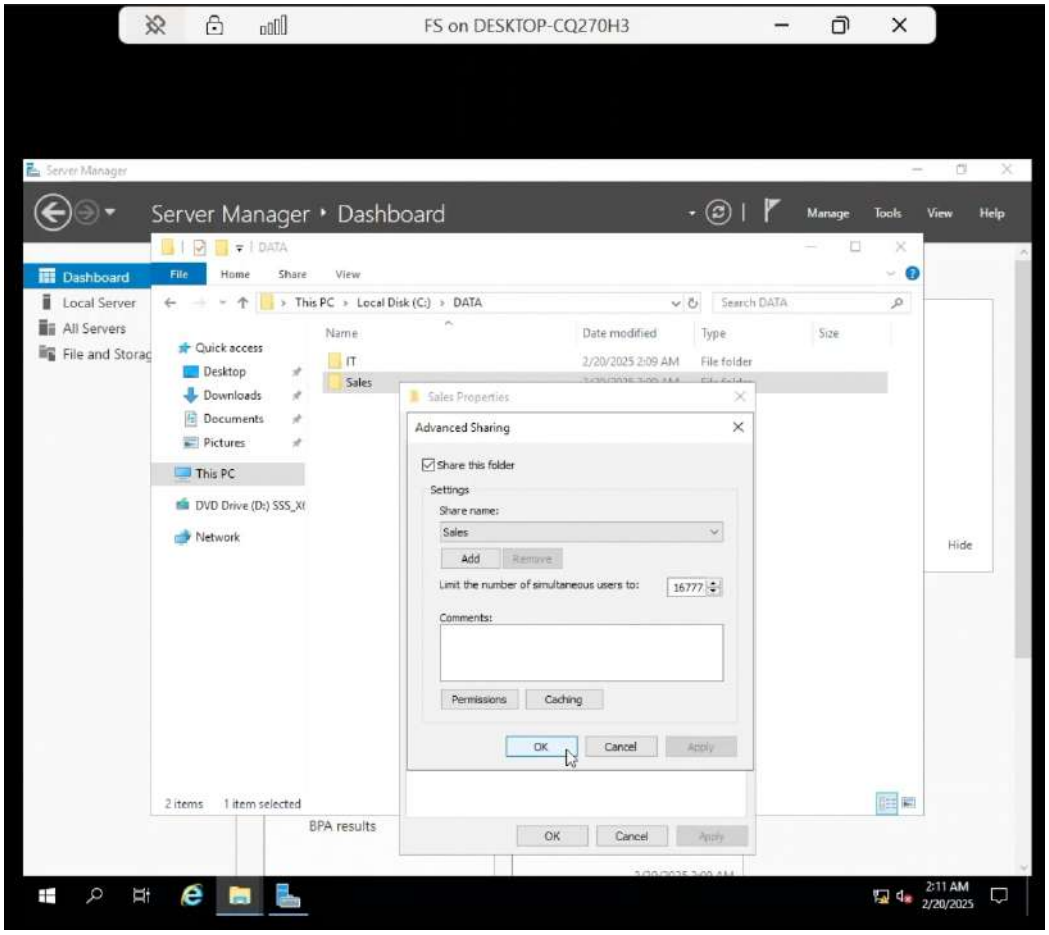

FS on DESKTOP-CQ270H3
Server Manager
Server Manager • Dashboard
Manage
Tools
View
Help
Dashboard
Local Server
All Servers
File and Storag
DATA
File
Home
Share
View
This PC • Local Disk (C:) • DATA
Search DATA
Quick access
Desktop
Downloads
Documents
Pictures
This PC
DVD Drive (D:) SSS_X
Network
Name
Date modified
Type
Size
IT
2/20/2025 2:09 AM
File folder
Sales
2/20/2025 2:09 AM
File folder
Hide
2 items
1 item selected
BPA results
2:09 AM
2/20/2025

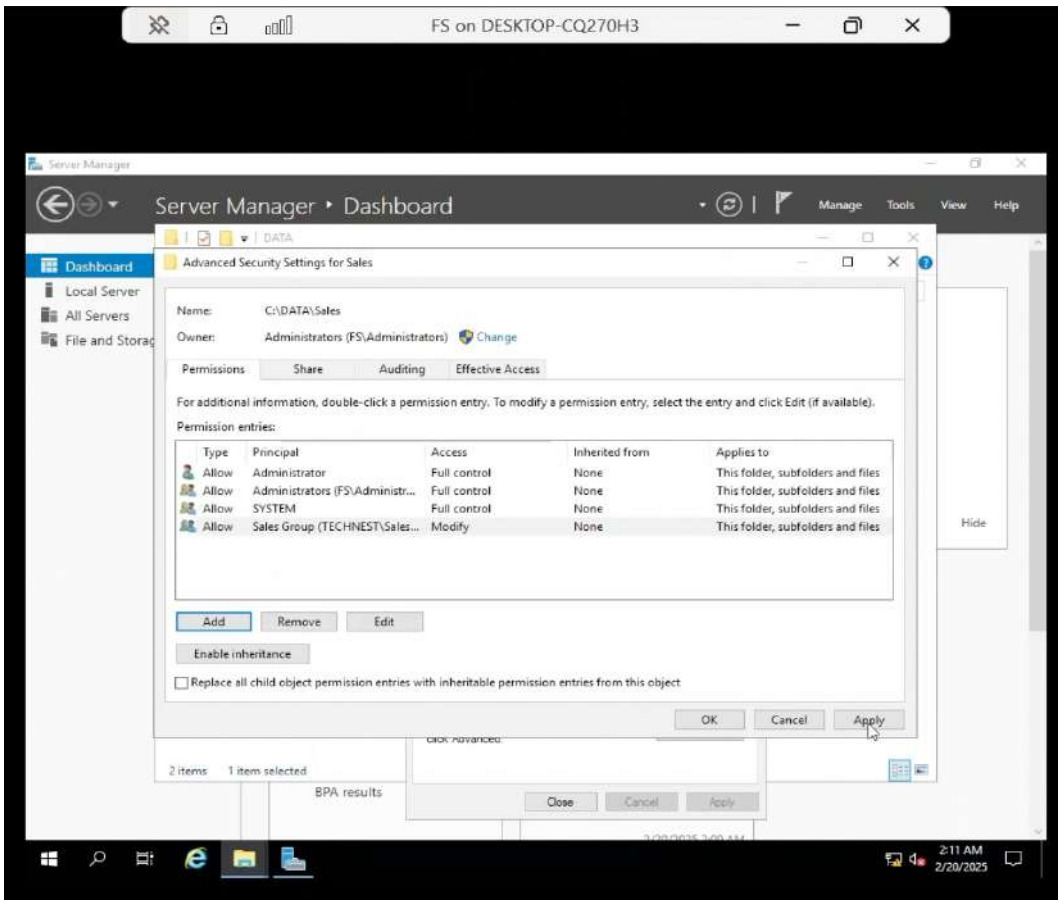

FS on DESKTOP-CQ270H3
Server Manager
Server Manager • Dashboard
Manage
Tools
View
Help
Dashboard
Local Server
All Servers
File and Storag
Local Disk (C:)
File
Home
Share
View
This PC • Local Disk (C:)
Search Local Disk (C:)
Quick access
Desktop
Downloads
Documents
Pictures
This PC
DVD Drive (D:)
Network
Name
Date modified
Type
Size
DATA
DATA Properties
Network access
Choose people on your network to share with
Type a name and then click Add, or click the arrow to find someone.
Add
Name
Permission Level
Administrator
Read/Write
Administrators
Owner
Everyone
Read
I'm having trouble sharing
Share
Cancel
Hide
6 items
BPA results
2:09 AM
2/20/2025


FS on DESKTOP-CQ270H3
Server Manager
Server Manager ▸ Dashboard
Manage
Tools
View
Help
Dashboard
Local Server
All Servers
File and Storag
Advanced Security Settings for DATA
Name: C:\DATA
Owner: Administrators (FS\Administrators) Change
Permissions
Share
Auditing
Effective Access
For additional information, double-click a permission entry. To modify a permission entry, select the entry and click Edit (if available).
Permission entries:
Type
Principal
Access
Inherited from
Applies to
Allow
Administrator
Full control
None
This folder, subfolders and files
Allow
Administrators (FS\Administr...
Full control
None
This folder, subfolders and files
Allow
Everyone
Read & execute
None
This folder, subfolders and files
Allow
SYSTEM
Full control
None
This folder, subfolders and files
Add
Remove
Edit
Enable inheritance
Replace all child object permission entries with inheritable permission entries from this object
OK
Cancel
Apply
6 items
1 item selected
Close
Cancel
Apply
BPA results
Hide
2:10 AM
2/20/2025


FS on DESKTOP-CQ270H3
Server Manager
Server Manager ▸ Dashboard
Manage
Tools
View
Help
Dashboard
Local Server
All Servers
File and Storag
DATA
File
Home
Share
View
This PC › Local Disk (C:) › DATA ›
Search DATA
Quick access
Desktop
Downloads
Documents
Pictures
This PC
DVD Drive (D:) SSS_X
Network
Name
Date modified
Type
Size
IT
Sales
IT Properties
Advanced Sharing
Share this folder
Settings
Share name:
IT
Add
Remove
Limit the number of simultaneous users to:
16777
Comments:
Permissions
Caching
OK
Cancel
Apply
2 items
1 item selected
BPA results
Hide
2:10 AM
2/20/2025

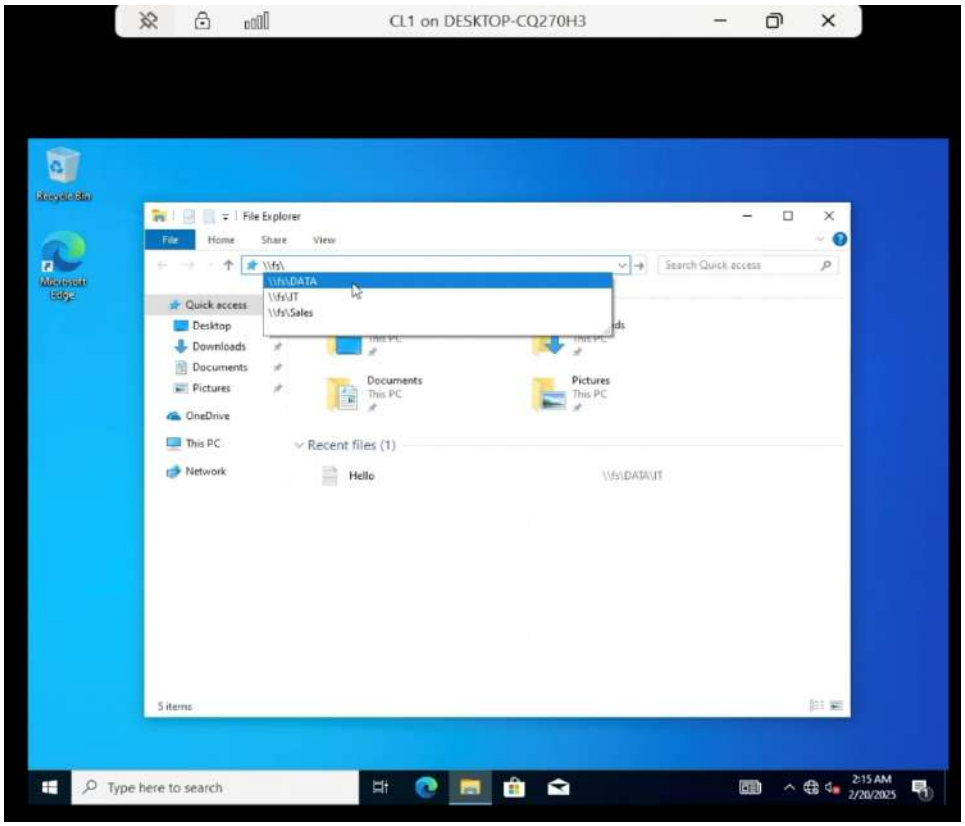

FS on DESKTOP-CQ270H3
Server Manager
Server Manager • Dashboard
Manage
Tools
View
Help
Dashboard
Local Server
All Servers
File and Storag
DATA
Advanced Security Settings for IT
Name: C:\DATA\IT
Owner: Administrators (FS\Administrators) Change
Permissions
Share
Auditing
Effective Access
For additional information, double-click a permission entry. To modify a permission entry, select the entry and click Edit (if available).
Permission entries:
Type
Principal
Access
Inherited from
Applies to
Allow
Administrator
Full control
None
This folder, subfolders and files
Allow
Administrators (FS\Administr...
Full control
None
This folder, subfolders and files
Allow
SYSTEM
Full control
None
This folder, subfolders and files
Allow
IT Group (TECHNEST\IT Group)
Modify
None
This folder, subfolders and files
Add
Remove
Edit
Enable inheritance
Replace all child object permission entries with inheritable permission entries from this object
OK
Cancel
Apply
2 items
1 item selected
BPA results
Close
Cancel
Apply
Hide
2:11 AM
2/20/2025

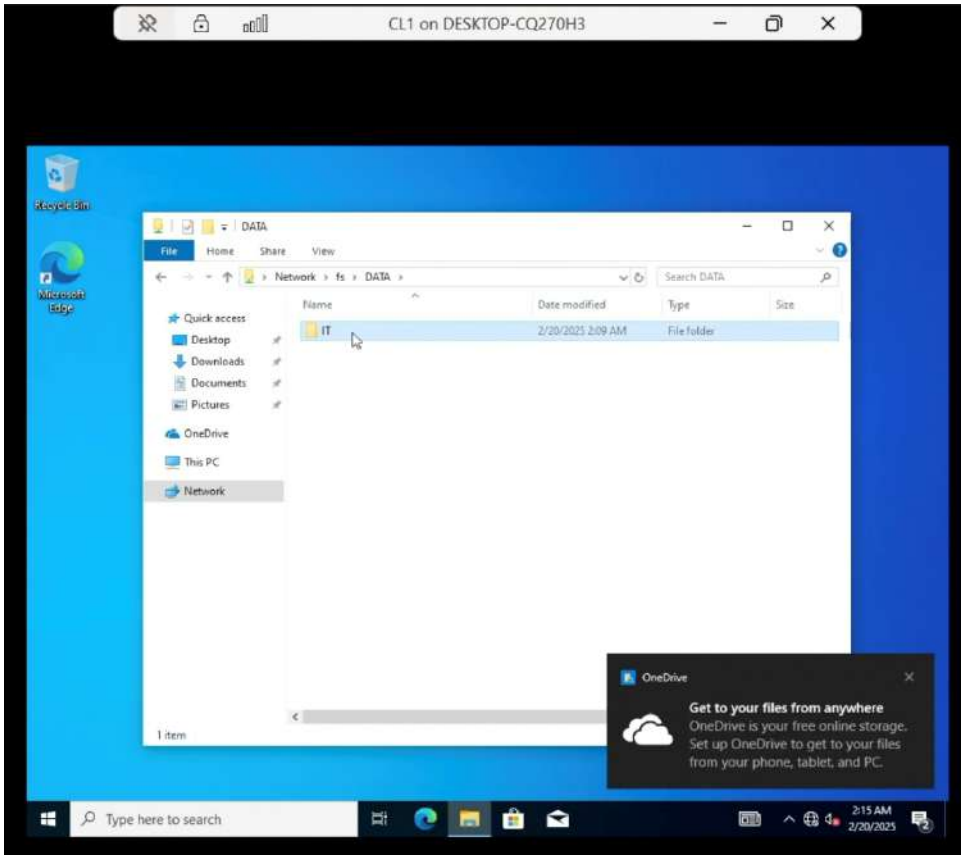

FS on DESKTOP-CQ270H3
Server Manager
Server Manager • Dashboard
Manage
Tools
View
Help
Dashboard
Local Server
All Servers
File and Storag
DATA
File
Home
Share
View
This PC › Local Disk (C:) › DATA
Search DATA
Quick access
Desktop
Downloads
Documents
Pictures
This PC
DVD Drive (D:) SSS_X
Network
Name
Date modified
Type
Size
IT
2/20/2025 2:09 AM
File folder
Sales
Sales Properties
Advanced Sharing
Share this folder
Settings
Share name:
Sales
Add
Remove
Limit the number of simultaneous users to:
16777
Comments:
Permissions
Caching
OK
Cancel
Apply
Hide
2 items
1 item selected
BPA results
2:11 AM
2/20/2025


FS on DESKTOP-CQ270H3
Server Manager
Server Manager • Dashboard
Manage
Tools
View
Help
Dashboard
Local Server
All Servers
File and Storag
DATA
Advanced Security Settings for Sales
Name:
C:\DATA\Sales
Owner:
Administrators (FS\Administrators)
Change
Permissions
Share
Auditing
Effective Access
For additional information, double-click a permission entry. To modify a permission entry, select the entry and click Edit (if available).
Permission entries:
Type
Principal
Access
Inherited from
Applies to
Allow
Administrator
Full control
None
This folder, subfolders and files
Allow
Administrators (FS\Administr...
Full control
None
This folder, subfolders and files
Allow
SYSTEM
Full control
None
This folder, subfolders and files
Allow
Sales Group (TECHNEST\Sales...
Modify
None
This folder, subfolders and files
Add
Remove
Edit
Enable inheritance
Replace all child object permission entries with inheritable permission entries from this object
OK
Cancel
Apply
Hide
2 items
1 item selected
BPA results
Close
Cancel
Apply
2:11 AM
2/20/2025

8. Test Folder Access via Client PCs

Log in with different user accounts to verify **folder permissions** (e.g., log in with the Tom user account to check if the user has access to the IT subfolder).





9. Configure Network Drive Mapping Using GPO

What is Network Drive Mapping?

Think of a network drive like a shortcut to a shared folder on the file server. Instead of searching for the folder every time, a mapped drive appears like a regular drive (e.g., I:) on your computer, making it easy to access important files.

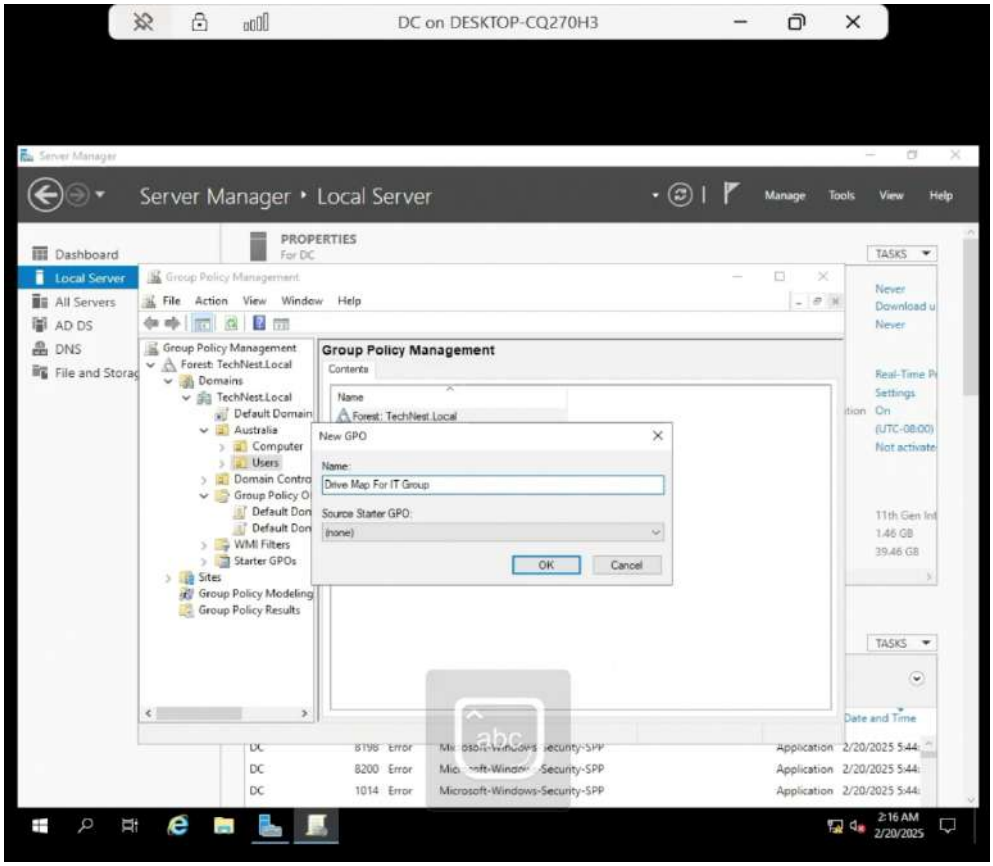
Why is it Important?

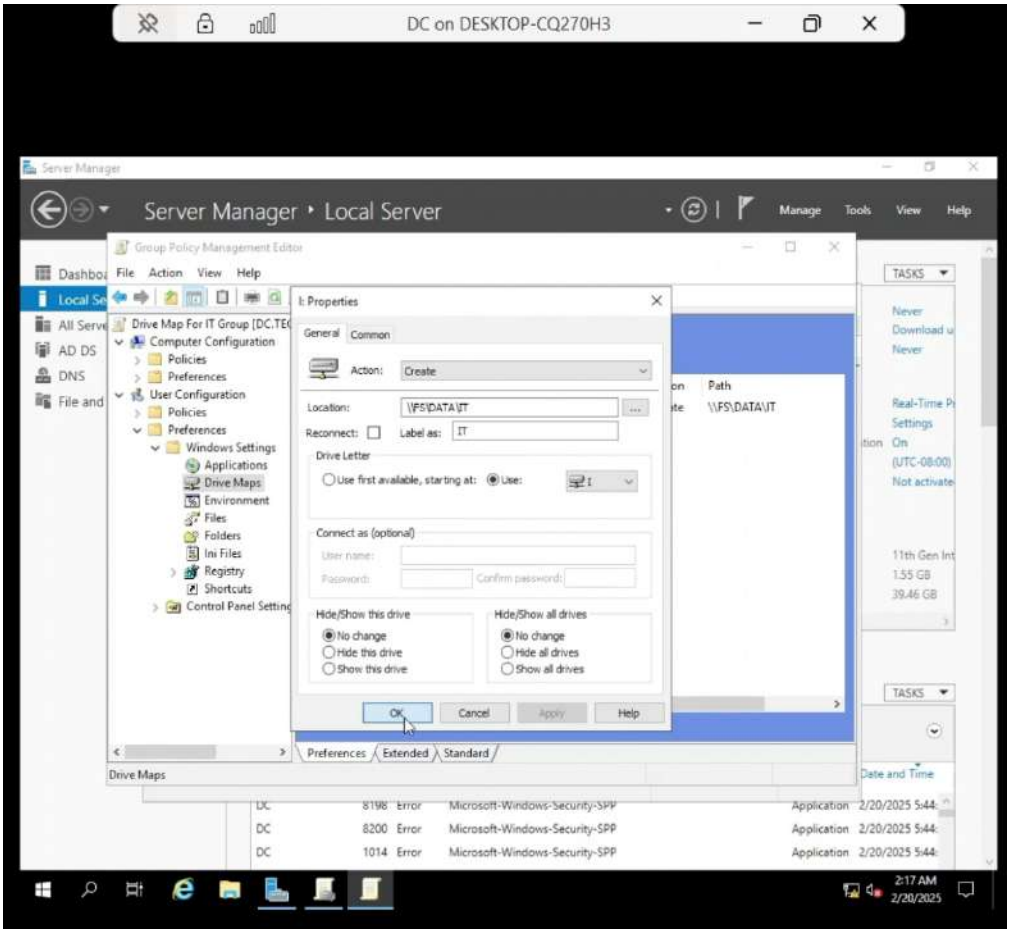
Manually finding and connecting to shared folders can be a hassle, especially in workplaces or learning environments where multiple users need access to the same resources. By setting up Group Policy Object (GPO) drive mapping, we ensure that every user automatically gets access to the right folders without needing to configure anything themselves. This makes work more efficient and reduces IT headaches.

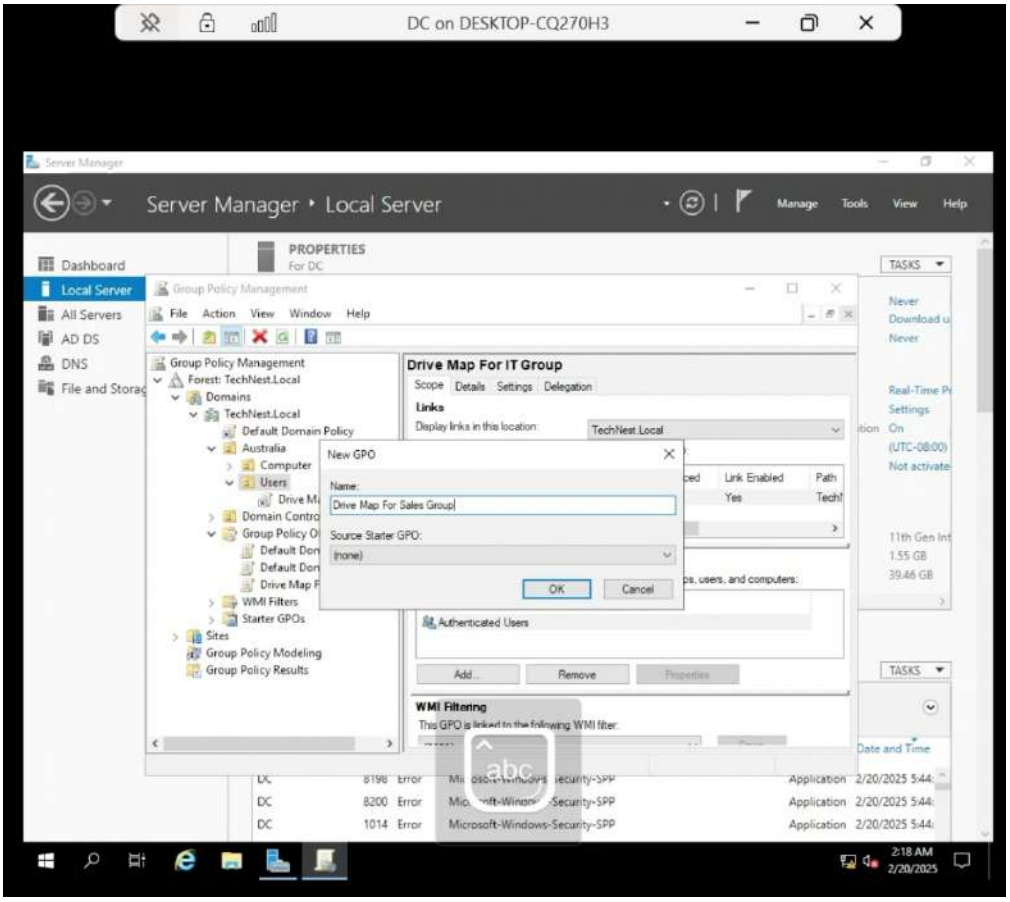
Why Are We Doing It?

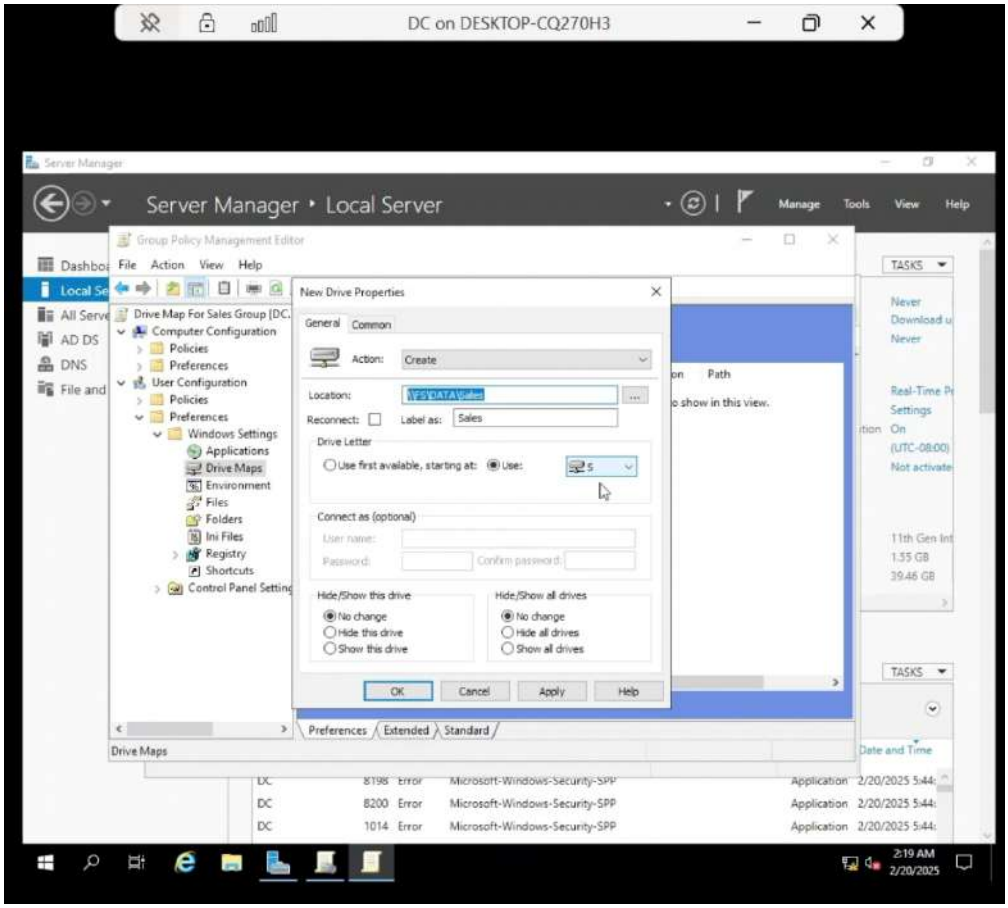
In this lab, we're using GPO to map a network drive so that every user who logs in gets immediate access to shared files without extra steps. This setup ensures that everything runs smoothly, and users don’t have to manually connect every time. Once the GPO is configured, we’ll test it on client PCs to make sure the mapped drives appear as expected.

Create a GPO to map a network drive for users.



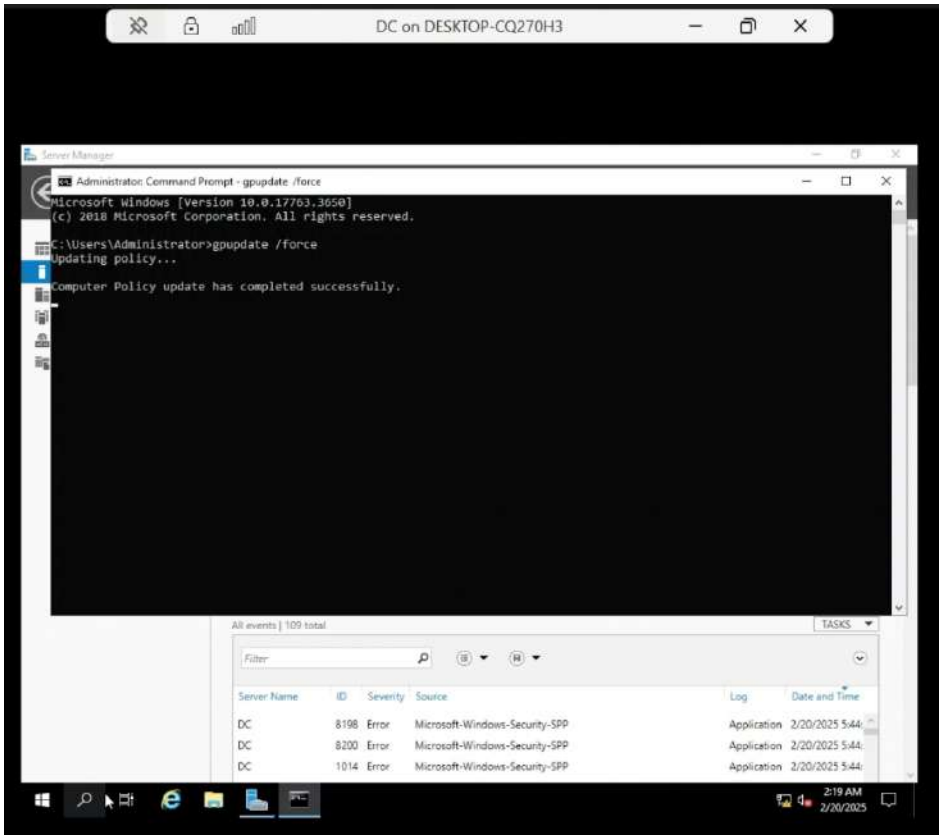

DC on DESKTOP-CQ270H3
Server Manager
Server Manager • Local Server
Manage
Tools
View
Help
Group Policy Management Editor
File Action View Help
Drive Map For IT Group [DC.TEC
Computer Configuration
Policies
Preferences
User Configuration
Policies
Preferences
Windows Settings
Applications
Drive Maps
Environment
Files
Folders
Ini Files
Registry
Shortcuts
Control Panel Setting
I: Properties
General
Common
Action:
Create
Location:
\\FS\DATA\IT
Reconnect:
Label as:
IT
Drive Letter
Use first available, starting at:
Use:
Connect as (optional)
User name:
Password:
Confirm password:
Hide/Show this drive
No change
Hide this drive
Show this drive
Hide/Show all drives
No change
Hide all drives
Show all drives
OK
Cancel
Apply
Help
Path
\\FS\DATA\IT
Preferences
Extended
Standard
Drive Maps
TASKS
Never
Download u
Never
Real-Time P
Settings
On
(UTC-08:00)
Not activate
11th Gen Int
1.55 GB
39.46 GB
Date and Time
DC 8198 Error Microsoft-Windows-Security-SPP Application 2/20/2025 5:44:
DC 8200 Error Microsoft-Windows-Security-SPP Application 2/20/2025 5:44:
DC 1014 Error Microsoft-Windows-Security-SPP Application 2/20/2025 5:44:
2:17 AM
2/20/2025


DC on DESKTOP-CQ270H3
Server Manager
Server Manager • Local Server
Manage
Tools
View
Help
Dashboard
Local Server
All Servers
AD DS
DNS
File and Storag
PROPERTIES
For DC
Group Policy Management
File Action View Window Help
Group Policy Management
Forest: TechNest.Local
Domains
TechNest.Local
Default Domain Policy
Australia
Computer
Users
Domain Contro
Group Policy O
WMI Filters
Starter GPOs
Sites
Group Policy Modeling
Group Policy Results
Drive Map For IT Group
Scope
Details
Settings
Delegation
Links
Display links in this location:
TechNest.Local
Link Enabled
Path
Yes
New GPO
Name:
Drive Map For Sales Group
Source Starter GPO:
(none)
OK
Cancel
Authenticated Users
Add...
Remove
Properties
WMI Filtering
This GPO is linked to the following WMI filter:
TASKS
Never
Download u
Never
Real-Time P
Settings
On
(UTC-08:00)
Not activate
11th Gen Int
1.55 GB
39.46 GB
Date and Time
DC 8198 Error Application 2/20/2025 5:44:
DC 8200 Error Application 2/20/2025 5:44:
DC 1014 Error Microsoft-Windows-Security-SPP Application 2/20/2025 5:44:
2:18 AM
2/20/2025

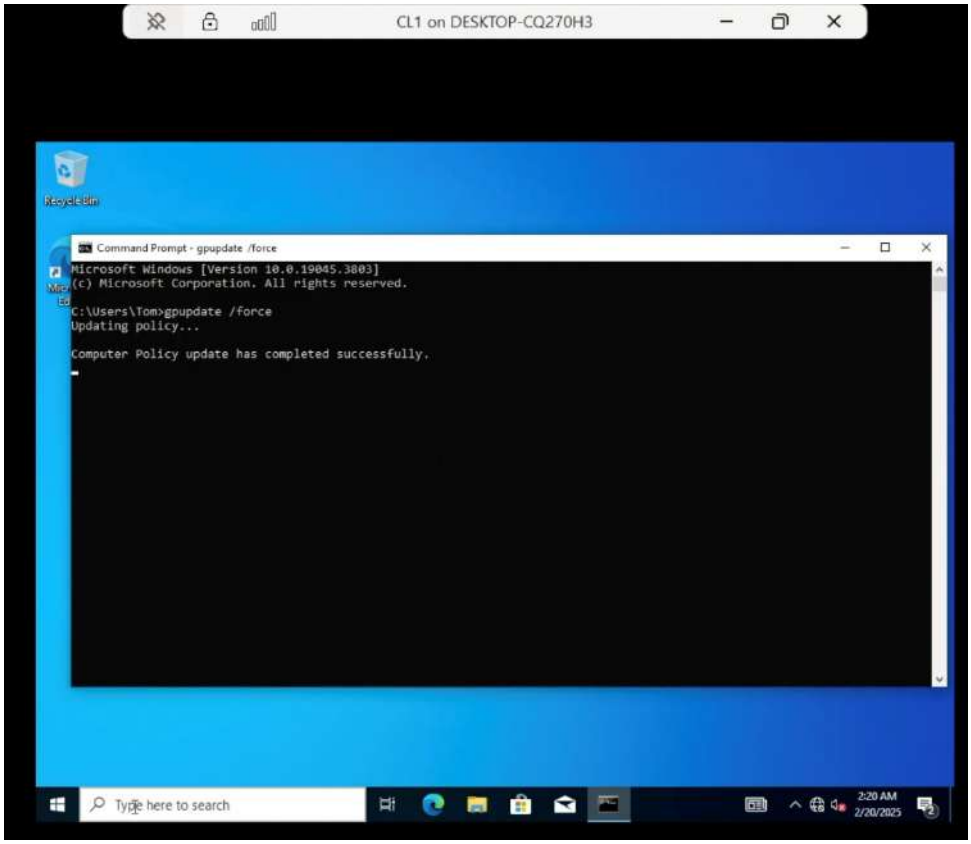


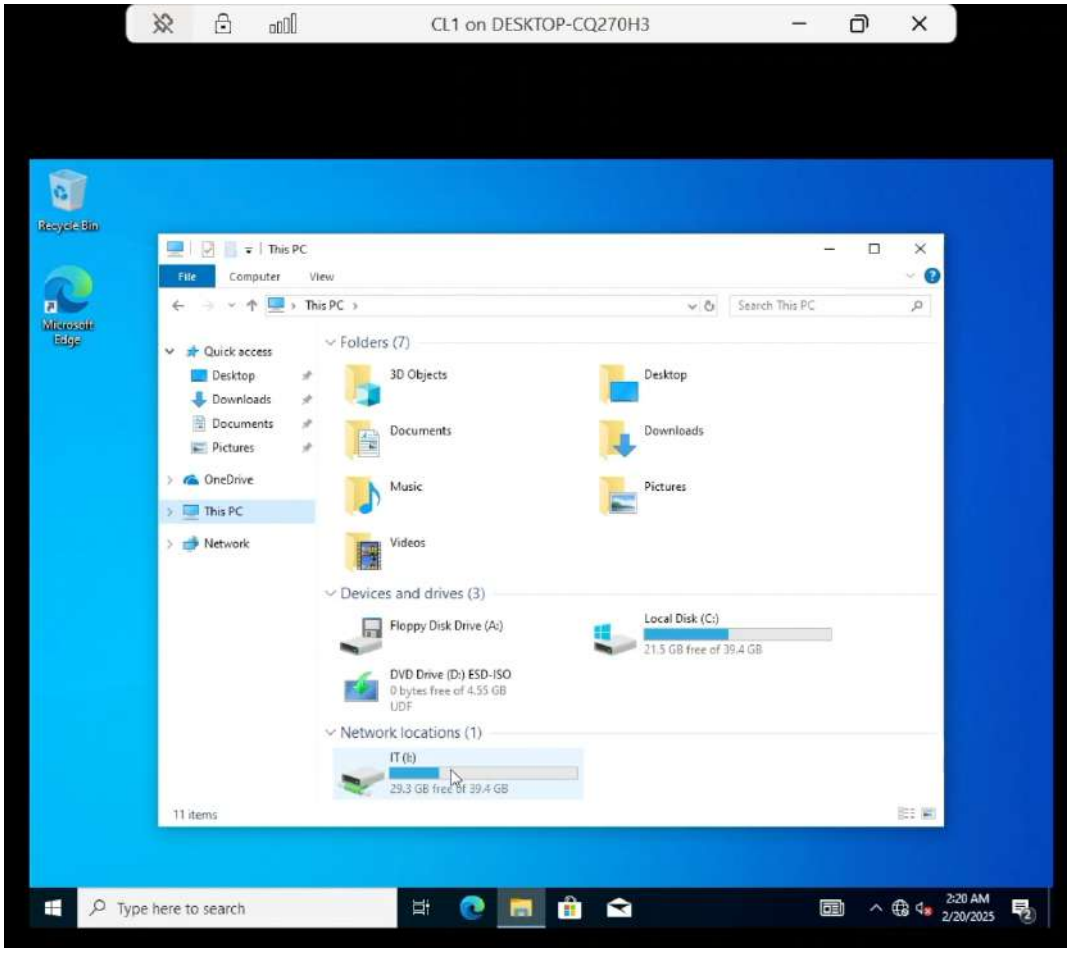
The Importance of Running gpupdate /force

After making changes to Group Policy, they don't apply immediately due to the system's automatic refresh cycle. Running the gpupdate /force command ensures that updates take effect right away. On the server, it applies the latest policies for distribution, while on client PCs, it forces them to retrieve and apply new settings without waiting or restarting. This makes testing, troubleshooting, and deploying changes more efficient.



Verify access from client PCs





Here, we can see that the new drive named “IT” with the drive letter “I” is accessible in Tom's user account.

10. Configure Folder Redirection Using GPO

What is it?

Folder Redirection is a way to store important user files, like Desktop and Documents, on a network drive instead of the local computer. This means users can log into any domain-joined computer and still see their files just as they left them.

Why is it Important?

Keeps Files Safe – If a computer crashes or gets replaced, files aren’t lost because they’re stored on a central server.

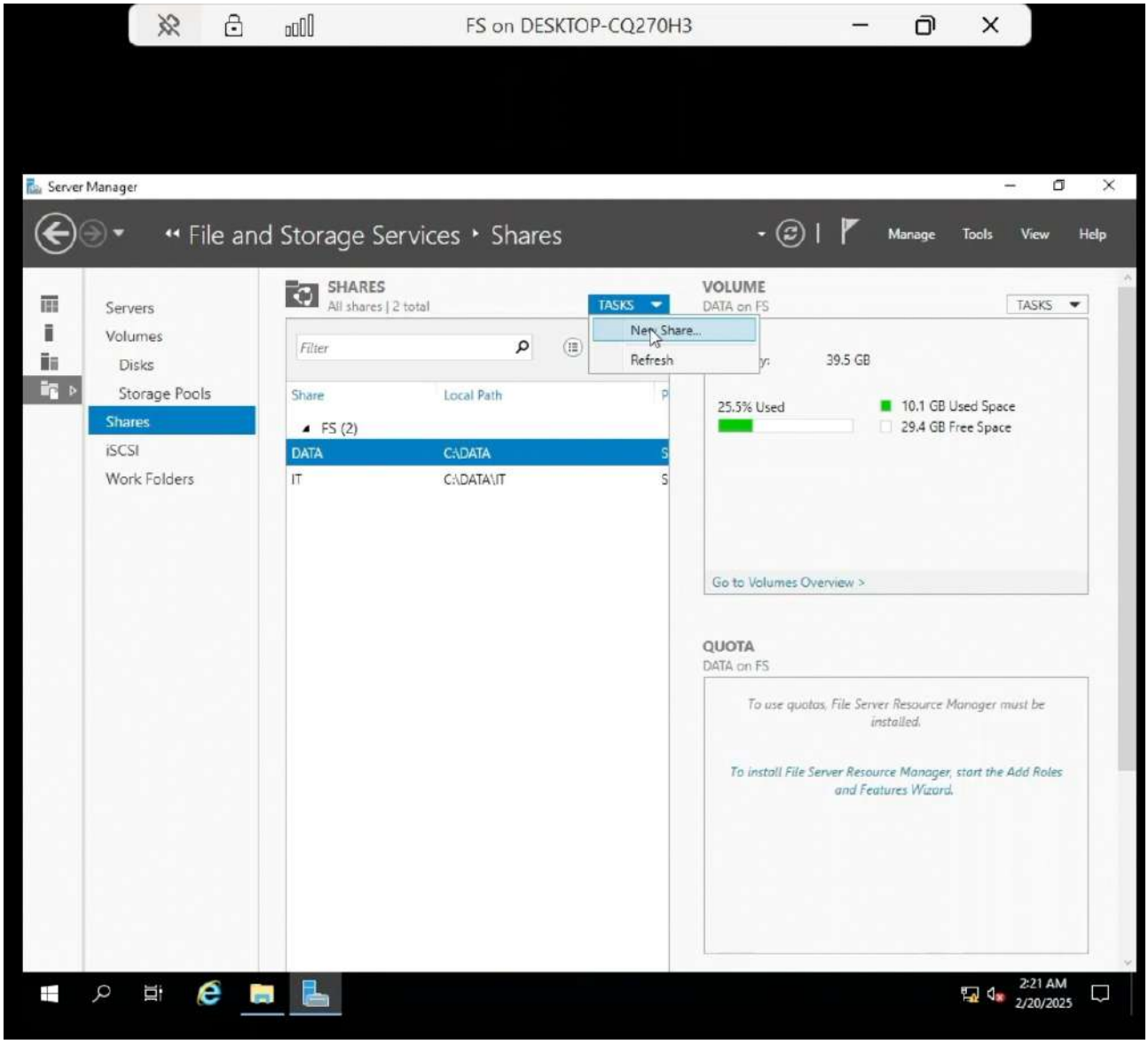
Access from Any Computer – Users don’t have to worry about switching computers; their files follow them wherever they log in.

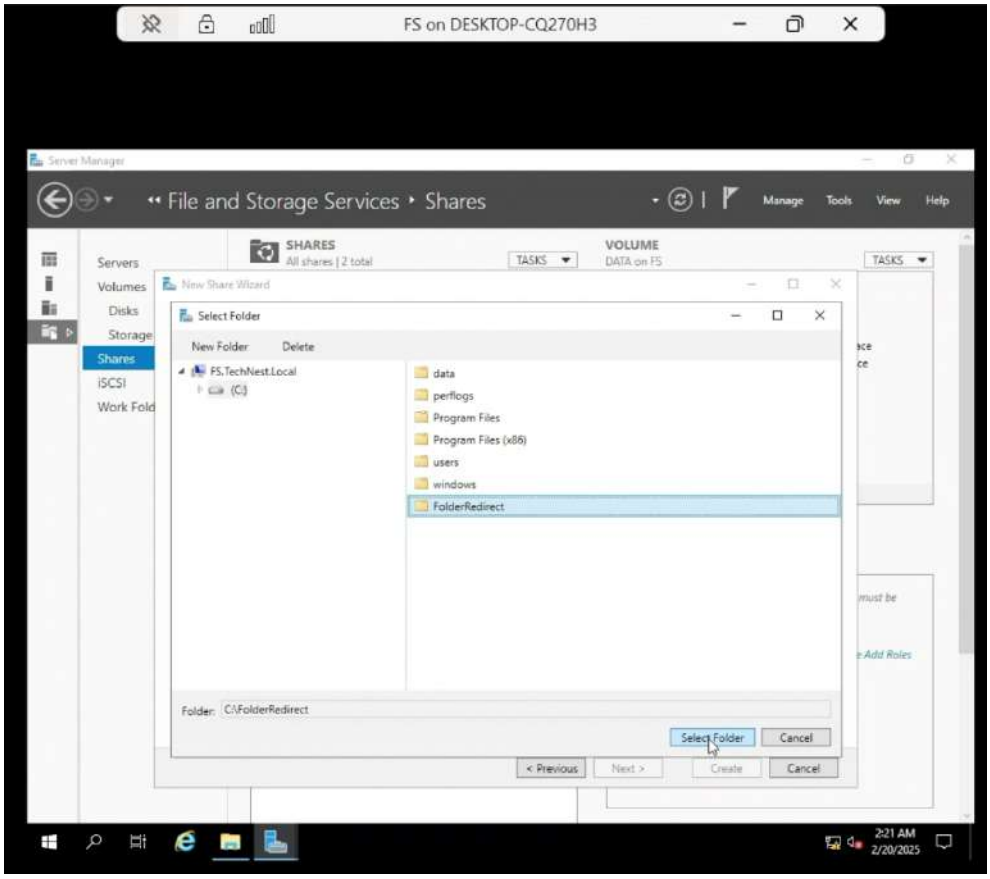
Easier Management – IT teams can back up and manage files centrally, reducing the risk of data loss.

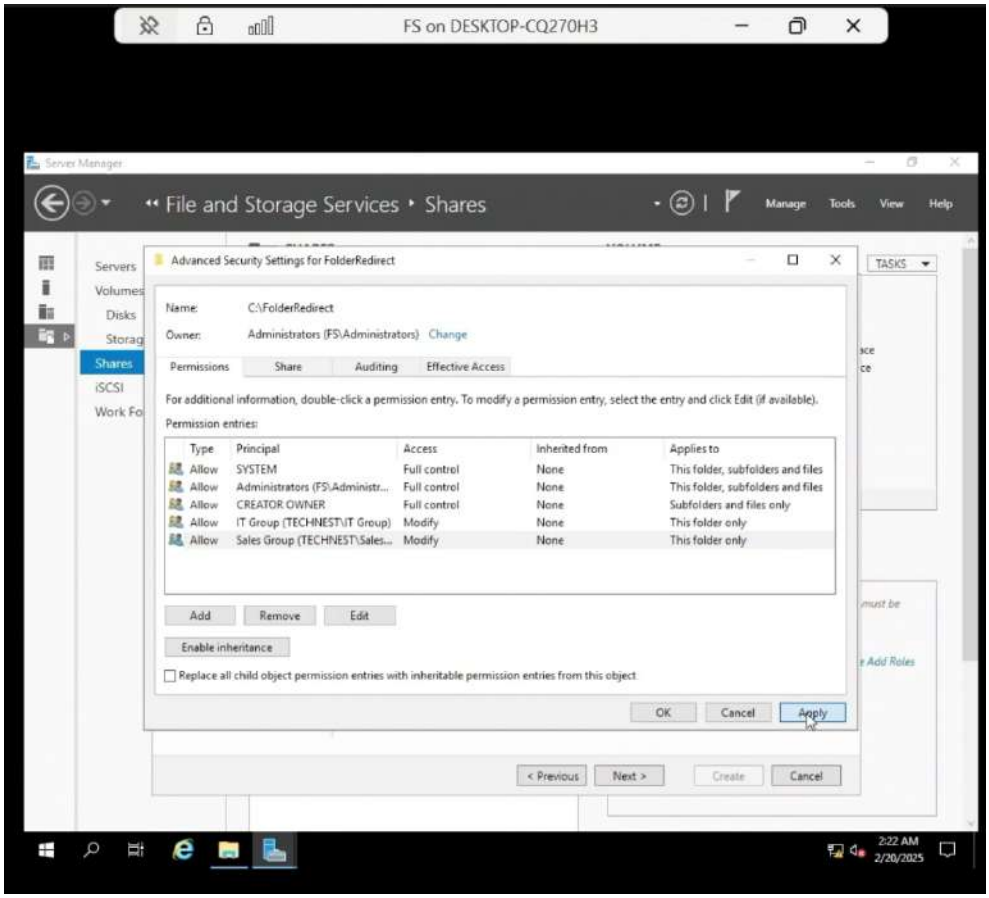
Why Are We Doing It?

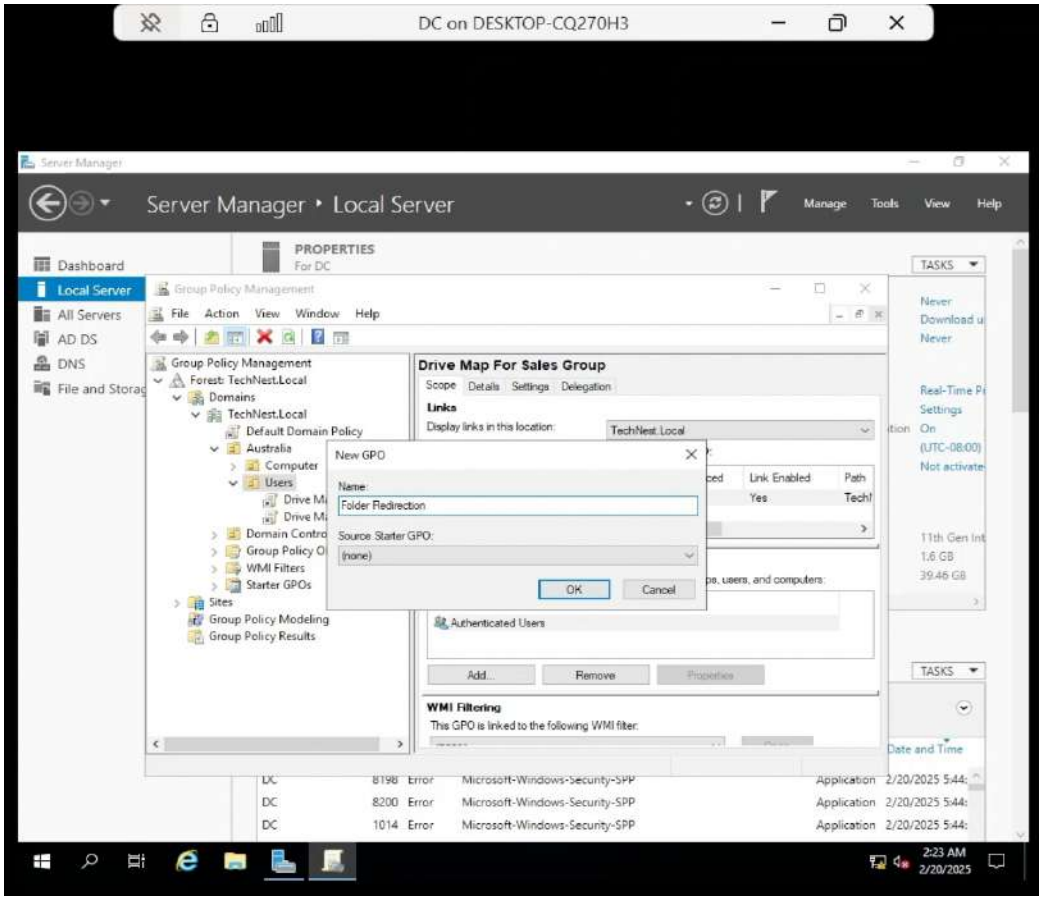
We're setting up folder redirection to make sure users always have access to their files, no matter which computer they use. It also makes life easier for IT support by keeping everything organized and secure in one place.

j. Create a shared folder (FolderRedirect) for Desktop & Documents.
k. Enable sharing & set NTFS permissions.
l. Apply a GPO to redirect user folders.




FS on DESKTOP-CQ270H3
File and Storage Services ▸ Shares
Manage
Tools
View
Help
Servers
Volumes
Disks
Storage
Shares
iSCSI
Work Fold
SHARES
All shares | 2 total
TASKS
VOLUME
DATA on FS
New Share Wizard
Select Folder
New Folder
Delete
FS.TechNest.Local
(C:)
data
perflogs
Program Files
Program Files (x86)
users
windows
FolderRedirect
Folder: C:\FolderRedirect
Select Folder
Cancel
< Previous
Next >
Create
Cancel
2:21 AM
2/20/2025


FS on DESKTOP-CQ270H3
File and Storage Services ▸ Shares
Manage
Tools
View
Help
Servers
Volumes
Disks
Shares
iSCSI
Advanced Security Settings for FolderRedirect
Name: C:\FolderRedirect
Owner: Administrators (FS\Administrators) Change
Permissions
Share
Auditing
Effective Access
For additional information, double-click a permission entry. To modify a permission entry, select the entry and click Edit (if available).
Permission entries:
Type
Principal
Access
Inherited from
Applies to
Allow SYSTEM Full control None This folder, subfolders and files
Allow Administrators (FS\Administr... Full control None This folder, subfolders and files
Allow CREATOR OWNER Full control None Subfolders and files only
Allow IT Group (TECHNEST\IT Group) Modify None This folder only
Allow Sales Group (TECHNEST\Sales... Modify None This folder only
Add
Remove
Edit
Enable inheritance
Replace all child object permission entries with inheritable permission entries from this object
OK
Cancel
Apply
< Previous
Next >
Create
Cancel
2:22 AM
2/20/2025


DC on DESKTOP-CQ270H3
Server Manager
Server Manager • Local Server
Manage
Tools
View
Help
Dashboard
Local Server
All Servers
AD DS
DNS
File and Storag
PROPERTIES
For DC
TASKS
Group Policy Management
File Action View Window Help
Group Policy Management
Forest: TechNest.Local
Domains
TechNest.Local
Default Domain Policy
Australia
Computer
Users
Domain Contro
Group Policy O
WMI Filters
Starter GPOs
Sites
Group Policy Modeling
Group Policy Results
Drive Map For Sales Group
Scope
Details
Settings
Delegation
Links
Display links in this location:
TechNest.Local
Link Enabled
Path
Yes
New GPO
Name:
Folder Redirection
Source Starter GPO:
(none)
OK
Cancel
Authenticated Users
Add...
Remove
WMI Filtering
This GPO is linked to the following WMI filter:
Date and Time
DC 8198 Error Microsoft-Windows-Security-SPP Application 2/20/2025 5:44:
DC 8200 Error Microsoft-Windows-Security-SPP Application 2/20/2025 5:44:
DC 1014 Error Microsoft-Windows-Security-SPP Application 2/20/2025 5:44:
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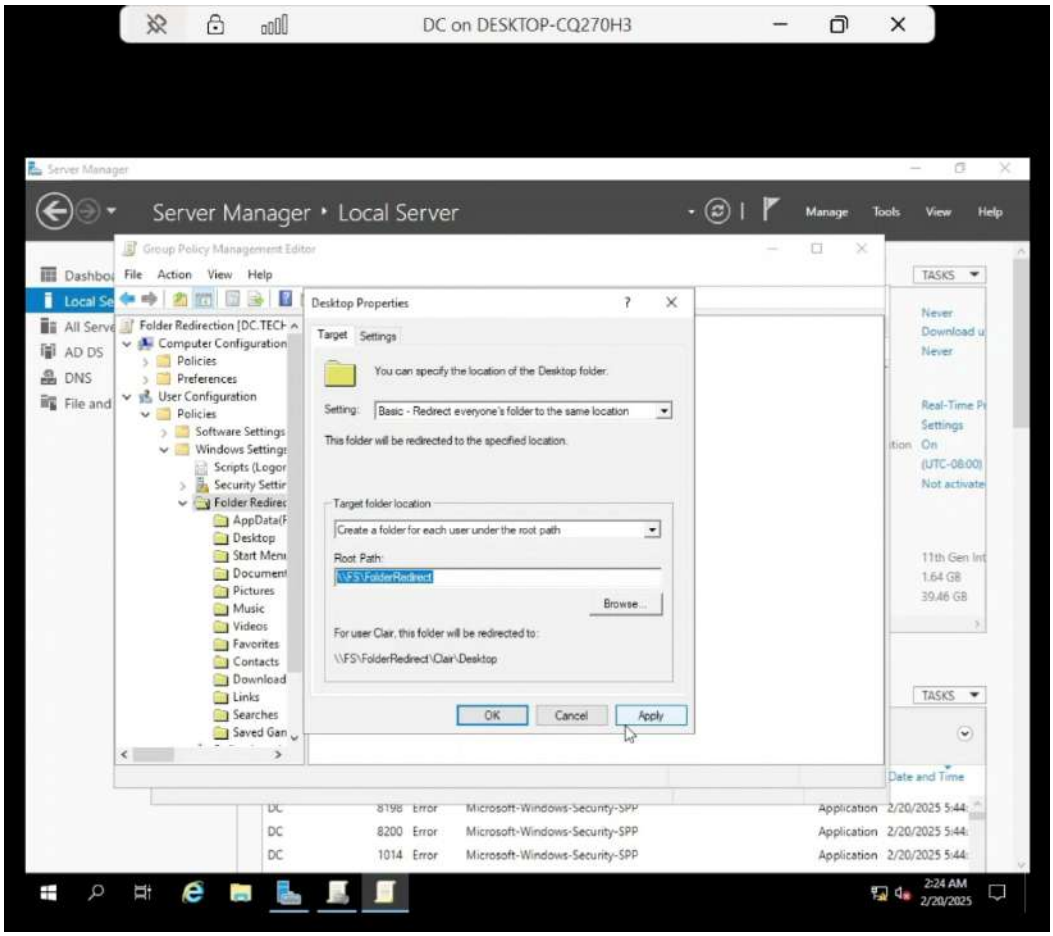
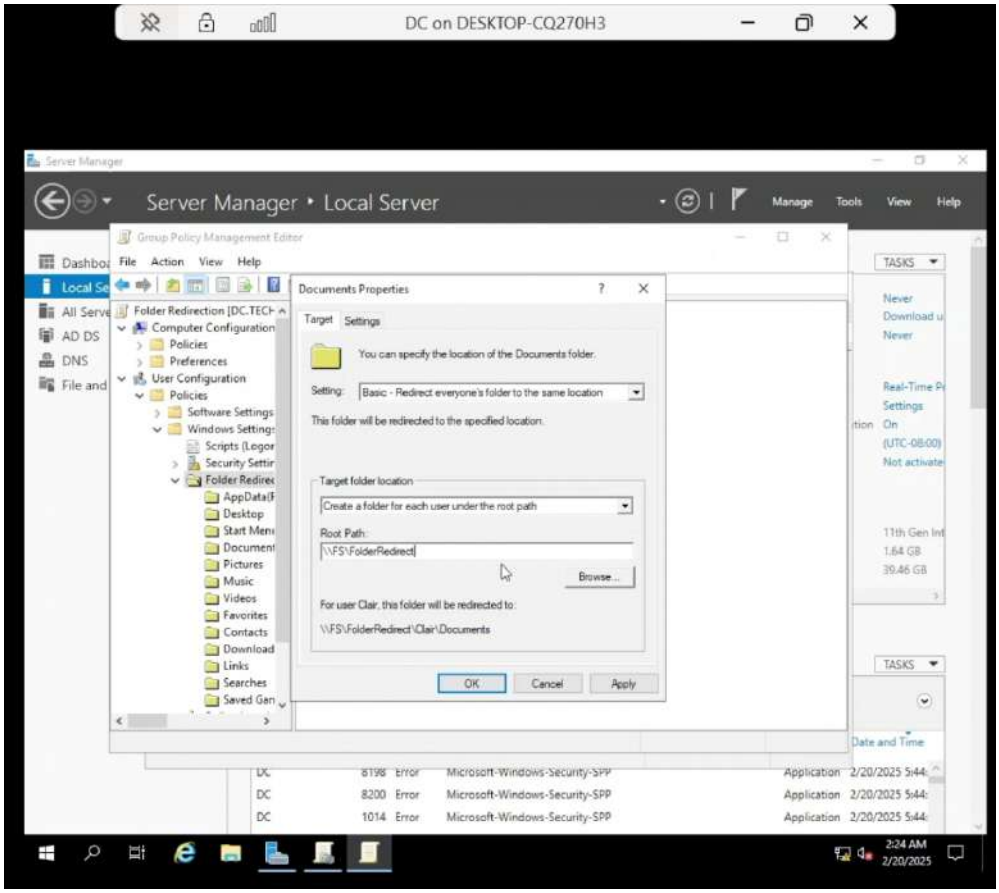
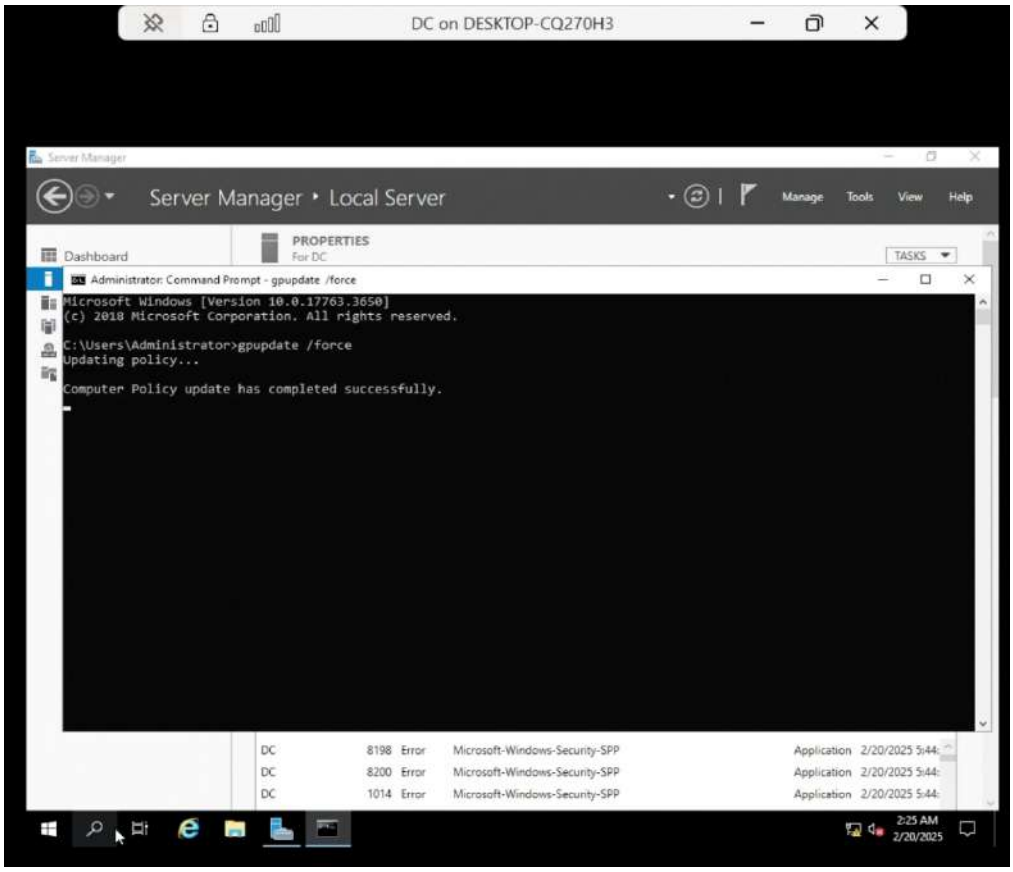
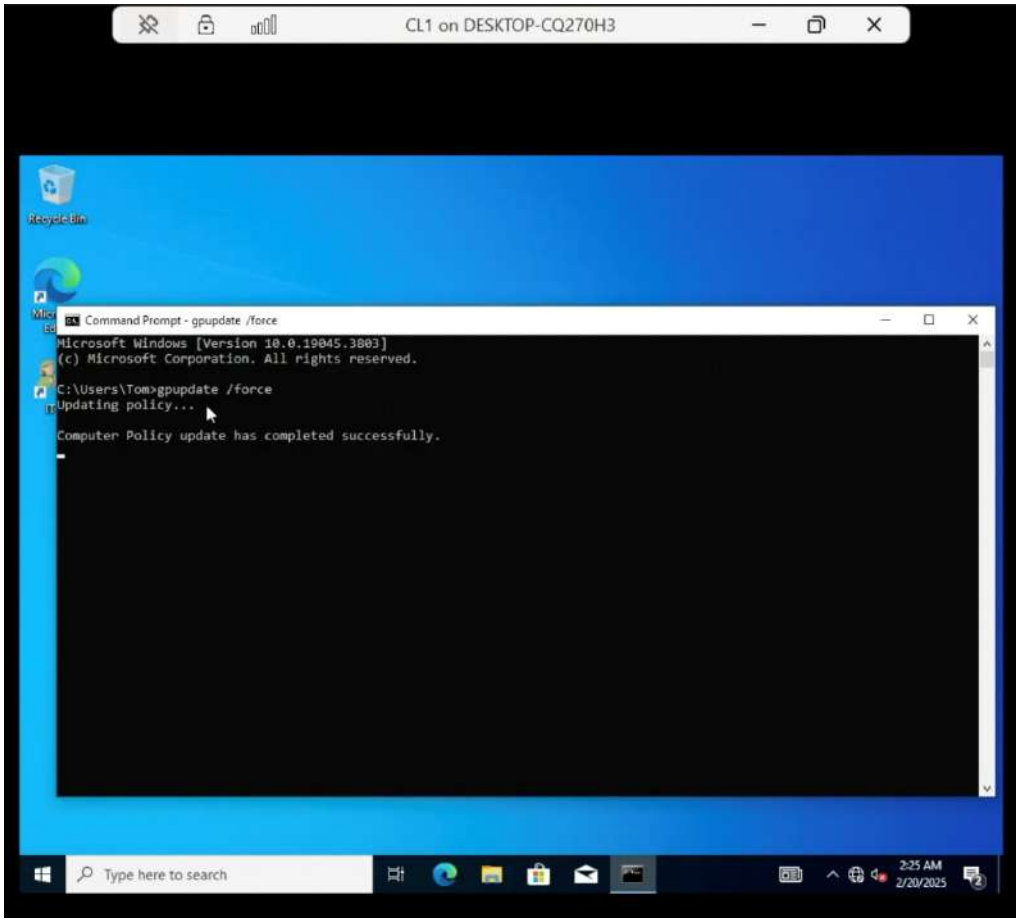
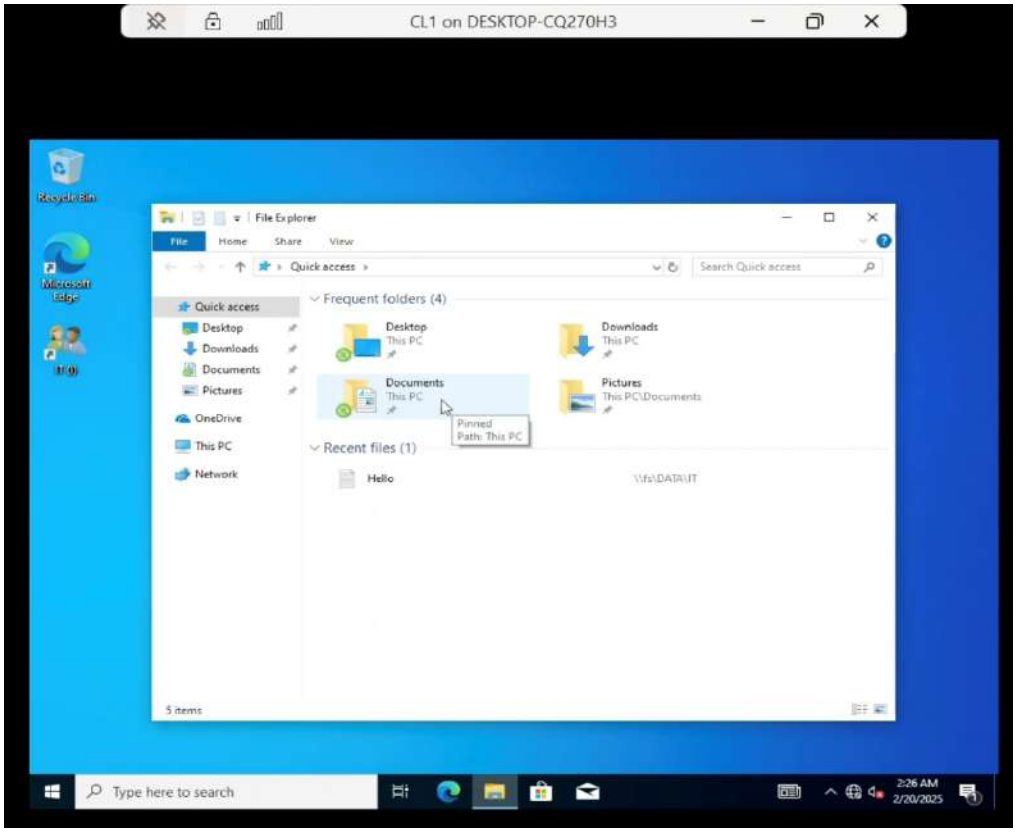
2/20/2025


DC on DESKTOP-CQ270H3
Server Manager
Server Manager • Local Server
Manage
Tools
View
Help
Group Policy Management Editor
File Action View Help
Folder Redirection [DC.TECH
Computer Configuration
Policies
Preferences
User Configuration
Policies
Software Settings
Windows Settings
Scripts (Logor
Security Settir
Folder Redires
AppData(F
Desktop
Start Menu
Document
Pictures
Music
Videos
Favorites
Contacts
Download
Links
Searches
Saved Gan
Desktop Properties
Target
Settings
You can specify the location of the Desktop folder.
Setting:
Basic - Redirect everyone's folder to the same location
This folder will be redirected to the specified location.
Target folder location
Create a folder for each user under the root path
Root Path:
\\FS\FolderRedirect
Browse...
For user Clair, this folder will be redirected to:
\\FS\FolderRedirect\Clair\Desktop
OK
Cancel
Apply
TASKS
Date and Time
DC 8198 Error Microsoft-Windows-Security-SPP Application 2/20/2025 5:44:
DC 8200 Error Microsoft-Windows-Security-SPP Application 2/20/2025 5:44:
DC 1014 Error Microsoft-Windows-Security-SPP Application 2/20/2025 5:44:
2:24 AM
2/20/2025


DC on DESKTOP-CQ270H3
Server Manager
Server Manager • Local Server
Manage
Tools
View
Help
Group Policy Management Editor
File
Action
View
Help
Documents Properties
Target
Settings
You can specify the location of the Documents folder.
Setting:
Basic - Redirect everyone's folder to the same location
This folder will be redirected to the specified location.
Target folder location
Create a folder for each user under the root path
Root Path:
\\FS\FolderRedirect
Browse...
For user Clair, this folder will be redirected to:
\\FS\FolderRedirect\Clair\Documents
OK
Cancel
Apply
Folder Redirection [DC.TECH
Computer Configuration
Policies
Preferences
User Configuration
Policies
Software Settings
Windows Settings
Scripts (Logon
Security Settin
Folder Redirec
AppData(R
Desktop
Start Menu
Document
Pictures
Music
Videos
Favorites
Contacts
Download
Links
Searches
Saved Gam
TASKS
DC 8198 Error Microsoft-Windows-Security-SPP Application 2/20/2025 5:44:
DC 8200 Error Microsoft-Windows-Security-SPP Application 2/20/2025 5:44:
DC 1014 Error Microsoft-Windows-Security-SPP Application 2/20/2025 5:44:
2:24 AM
2/20/2025


DC on DESKTOP-CQ270H3
Server Manager
Server Manager • Local Server
Manage
Tools
View
Help
Dashboard
PROPERTIES
For DC
TASKS
Administrator: Command Prompt - gpupdate /force
Microsoft Windows [Version 10.0.17763.3650]
(c) 2018 Microsoft Corporation. All rights reserved.
C:\Users\Administrator>gpupdate /force
Updating policy...
Computer Policy update has completed successfully.
DC 8198 Error Microsoft-Windows-Security-SPP Application 2/20/2025 5:44:
DC 8200 Error Microsoft-Windows-Security-SPP Application 2/20/2025 5:44:
DC 1014 Error Microsoft-Windows-Security-SPP Application 2/20/2025 5:44:
2:25 AM
2/20/2025

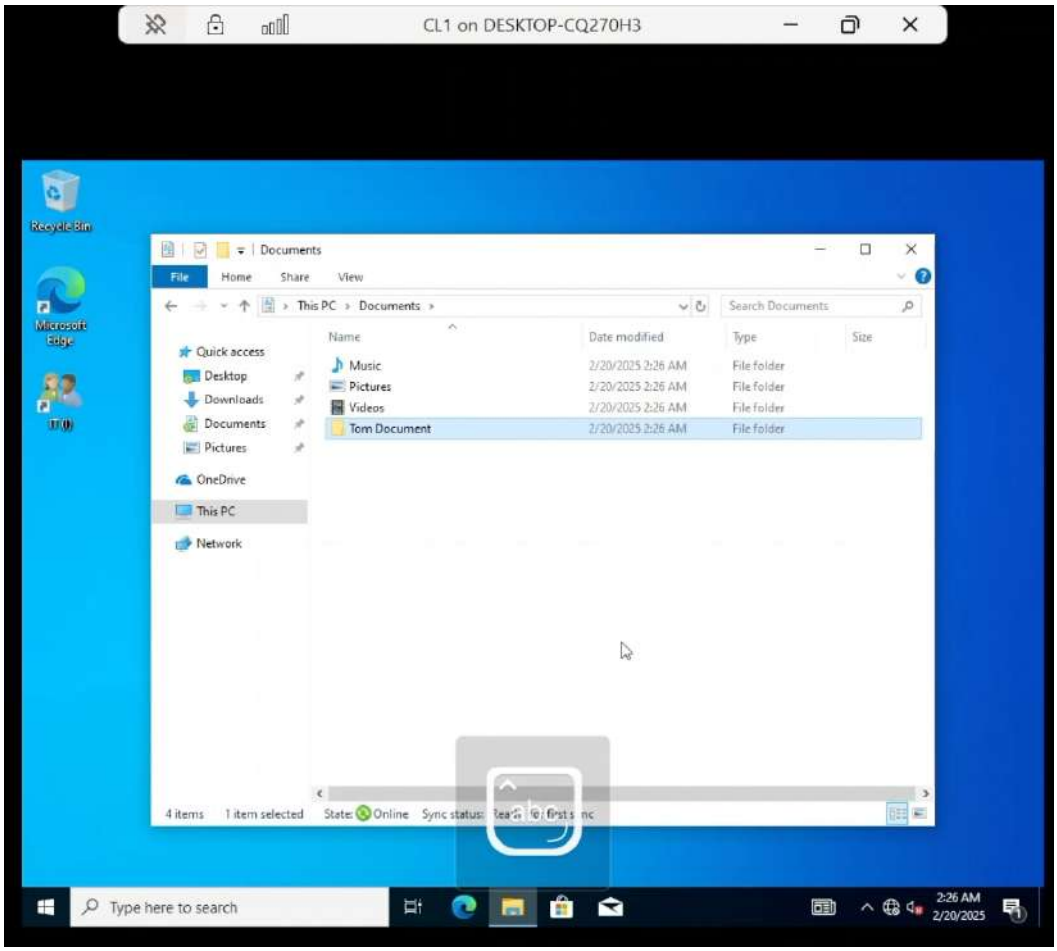

CL1 on DESKTOP-CQ270H3
Recycle Bin
Command Prompt - gpupdate /force
Microsoft Windows [Version 10.0.19045.3803]
(c) Microsoft Corporation. All rights reserved.
C:\Users\Tom>gpupdate /force
Updating policy...
Computer Policy update has completed successfully.
Type here to search
2:25 AM
2/20/2025

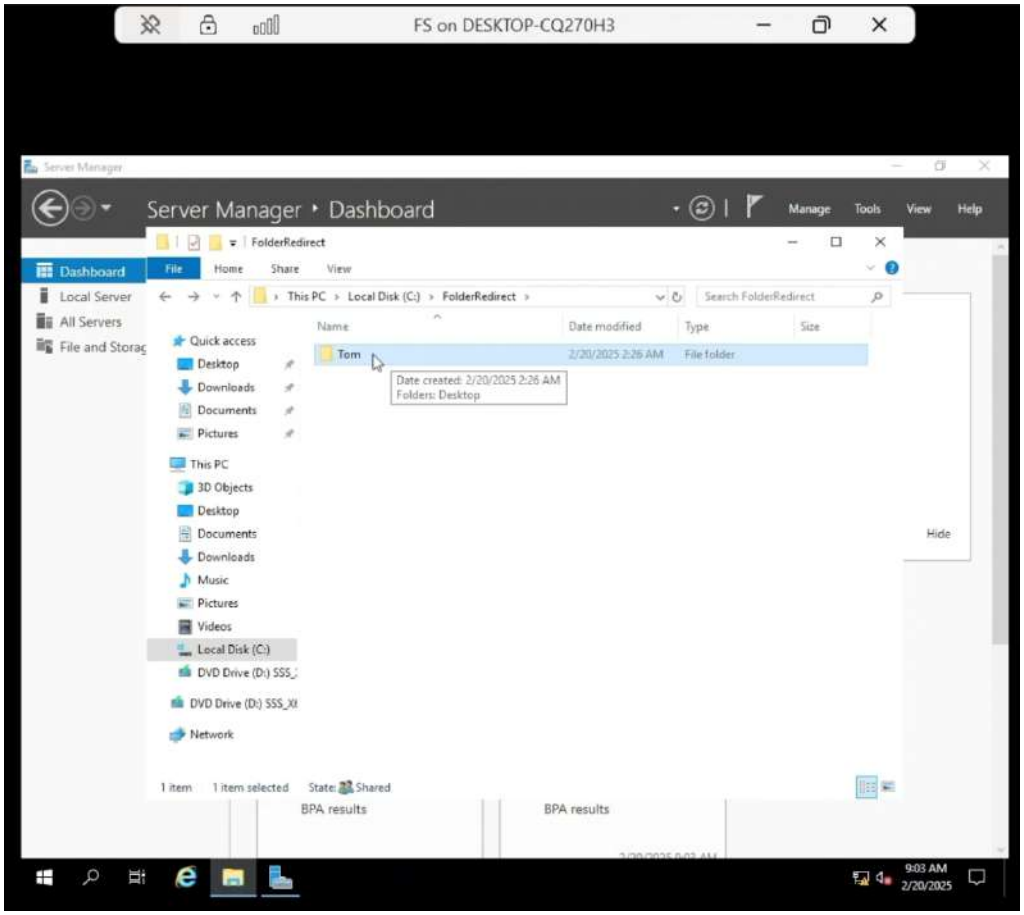

CL1 on DESKTOP-CQ270H3
Recycle Bin
Microsoft Edge
File Explorer
File
Home
Share
View
Quick access
Search Quick access
Quick access
Desktop
Downloads
Documents
Pictures
OneDrive
This PC
Network
Frequent folders (4)
Desktop
This PC
Downloads
This PC
Documents
This PC
Pictures
This PC\Documents
Pinned
Path: This PC
Recent files (1)
Hello
\\fs\DATA\IT
5 items
Type here to search
2:26 AM
2/20/2025

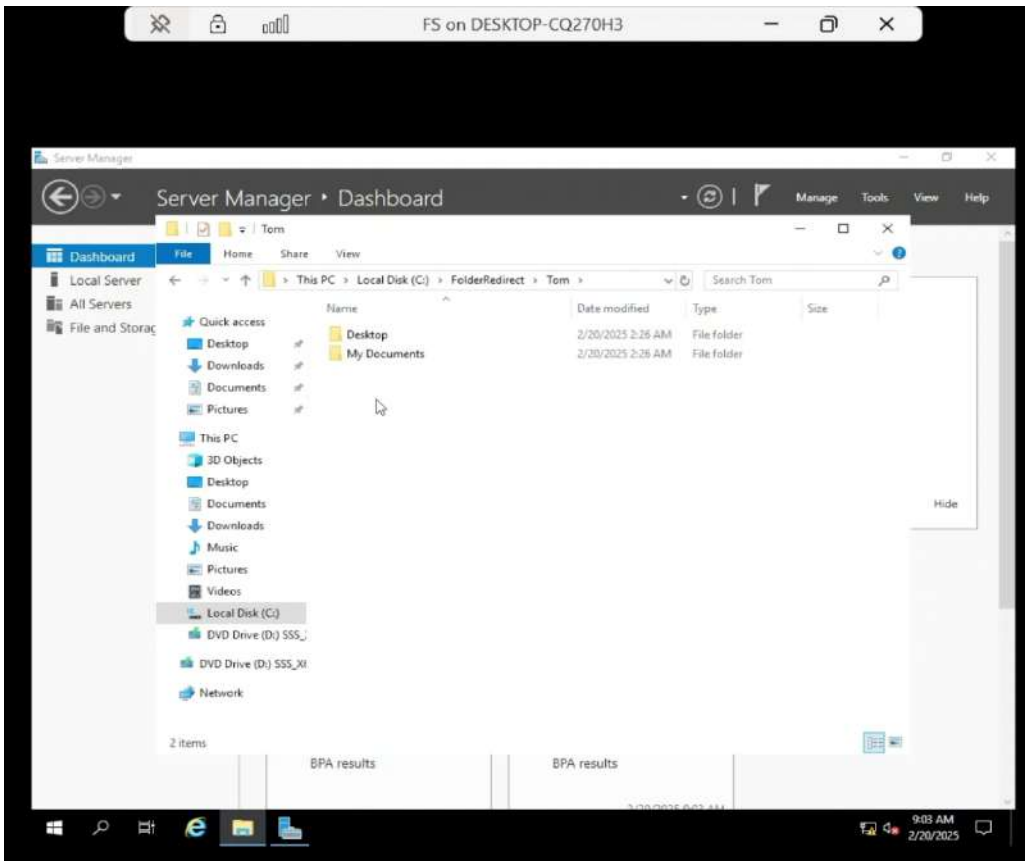
Ensuring Data Security and Accessibility with Folder Redirection

When Folder Redirection is applied via Group Policy, the user's redirected folders, such as Desktop and Documents, are stored on the File Server instead of the local computer. To test this, we created a new folder named "Tom Document" in the Documents directory to verify that Tom's profile is automatically created in the "FolderRedirect" folder on the File Server (FS). This ensures that the redirection is working correctly for folders like Desktop and Documents.

This setup is useful because it ensures that user data is stored centrally, making it easier to back up, secure, and access from different devices. It also prevents data loss if the local machine fails, improving data availability and security across the network.




FS on DESKTOP-CQ270H3
Server Manager
Server Manager • Dashboard
Manage
Tools
View
Help
Dashboard
Local Server
All Servers
File and Storag
FolderRedirect
File
Home
Share
View
This PC › Local Disk (C:) › FolderRedirect ›
Search FolderRedirect
Quick access
Desktop
Downloads
Documents
Pictures
This PC
3D Objects
Desktop
Documents
Downloads
Music
Pictures
Videos
Local Disk (C:)
DVD Drive (D:) SSS_
DVD Drive (D:) SSS_XI
Network
Name
Date modified
Type
Size
Tom
2/20/2025 2:26 AM
File folder
Date created: 2/20/2025 2:26 AM
Folders: Desktop
Hide
1 item
1 item selected
State: Shared
BPA results
BPA results
9:03 AM
2/20/2025


FS on DESKTOP-CQ270H3
Server Manager
Server Manager • Dashboard
Manage
Tools
View
Help
Dashboard
Local Server
All Servers
File and Storag
Tom
File
Home
Share
View
This PC › Local Disk (C:) › FolderRedirect › Tom ›
Search Tom
Quick access
Desktop
Downloads
Documents
Pictures
This PC
3D Objects
Desktop
Documents
Downloads
Music
Pictures
Videos
Local Disk (C:)
DVD Drive (D:) SSS_
DVD Drive (D:) SSS_XI
Network
Name
Date modified
Type
Size
Desktop
2/20/2025 2:26 AM
File folder
My Documents
2/20/2025 2:26 AM
File folder
Hide
2 items
BPA results
BPA results
9:03 AM
2/20/2025

11. Conclusion

This home lab serves as a foundation for building real-world IT skills in Windows Server administration, networking, and system management. By following this guide, users can practice and develop essential skills in Active Directory, Group Policy, and file server management, which are valuable for roles such as System Administrator, Network Engineer, and IT Support Specialist.