Active Directory Domain Environment Deployment and Permission Management Report

Basic Information

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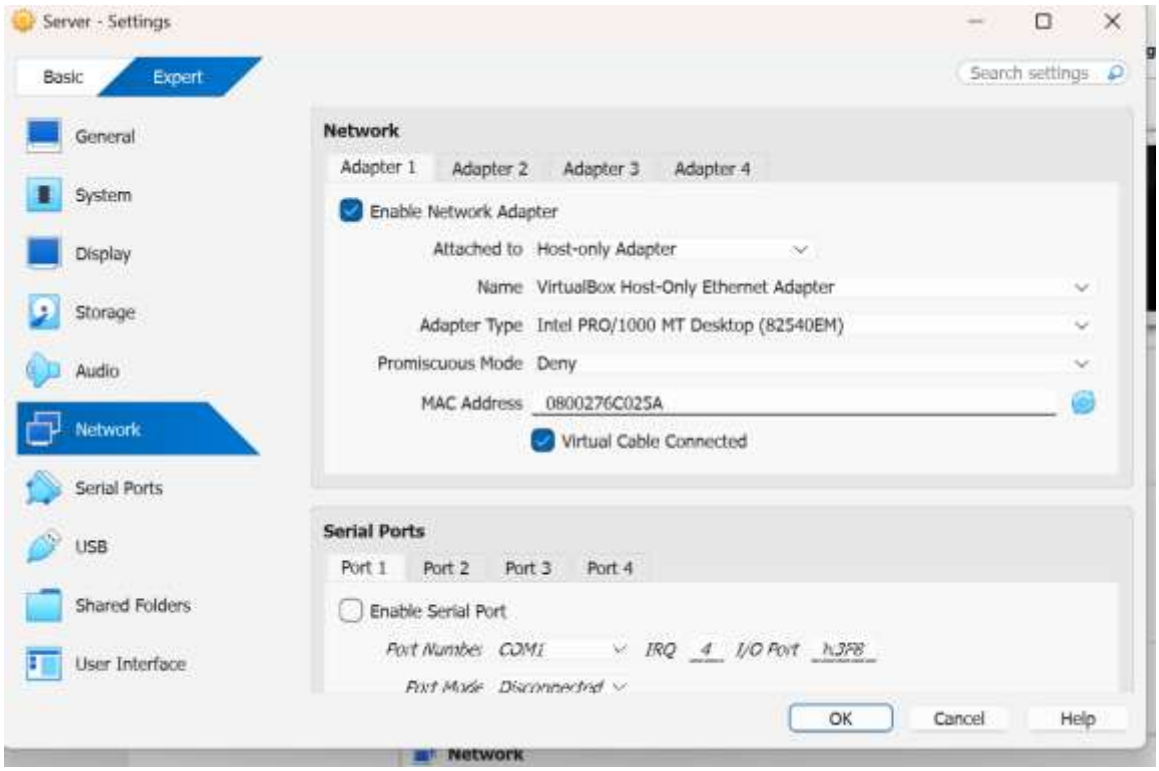
Environment	Oracle VirtualBox + Windows Server 2022 + Windows 11
Objective	Build a complete Active Directory (AD) domain environment in a virtualized lab, enabling user management, group policy deployment, and file-sharing permission control.
File Name	AD_Lab_Deployment_Report_EN_Full_GaoyuanZhang_B00961366.docx

Experiment Steps and Results

Step 0: Prepare Virtual Machines and ISO Images

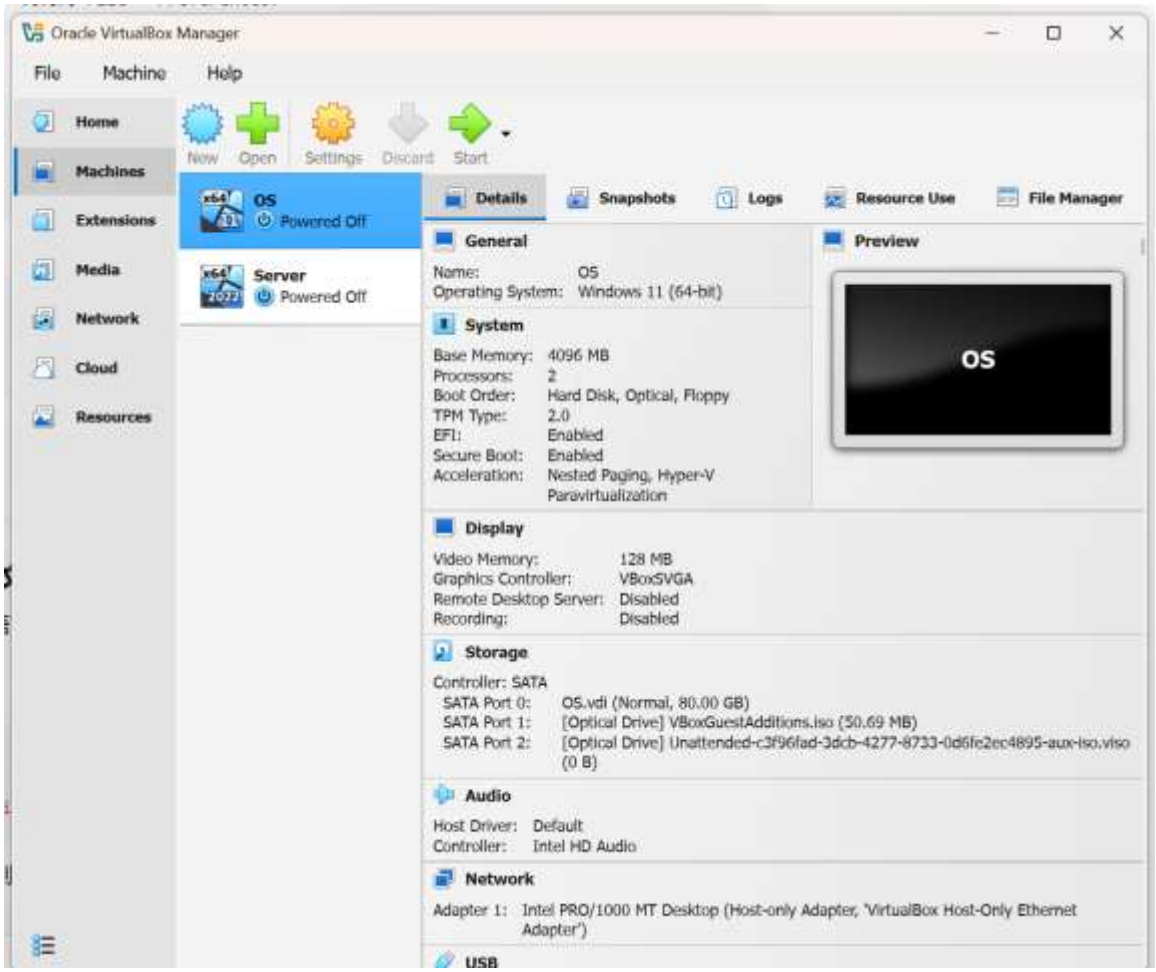
Description: Two virtual machines were created in Oracle VirtualBox — one for Windows Server 2022 and another for Windows 11. Server01 was configured with 4–8GB RAM, 60GB+ disk, and two CPUs. The Windows 11 client had 4GB RAM and 40GB+ disk. Installation ISO files for both systems were attached for setup.

Step 1: Configure VirtualBox Network Settings



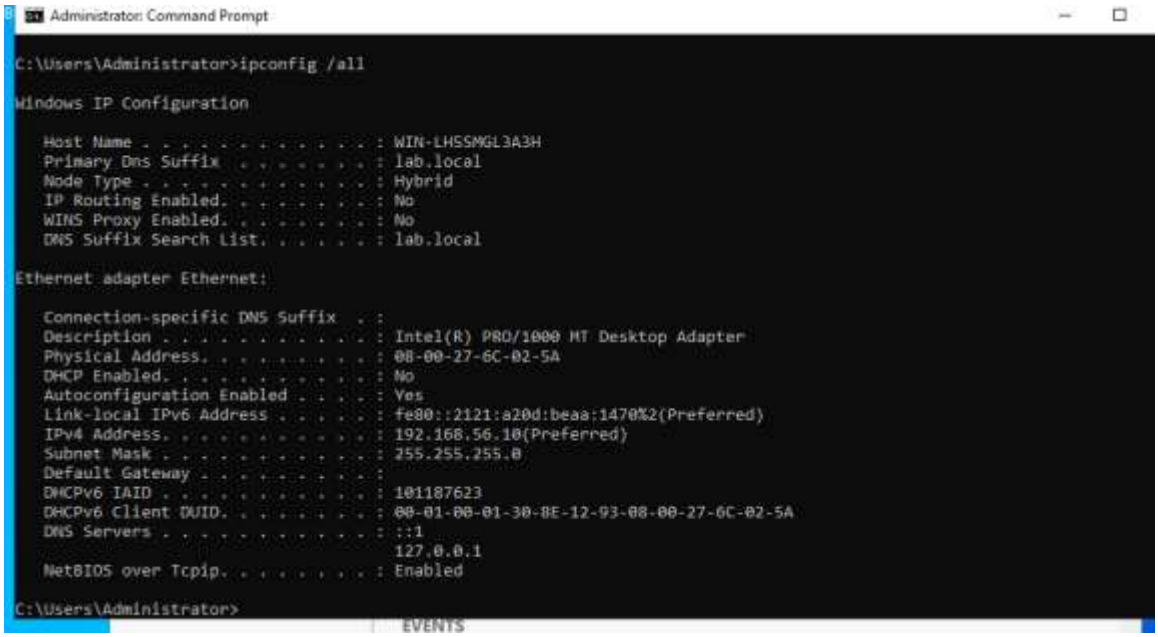
Description: Both virtual machines were configured with two network adapters: Adapter 1 (Host-Only) for internal domain communication.

Step 2: Install Windows Server (Domain Controller)



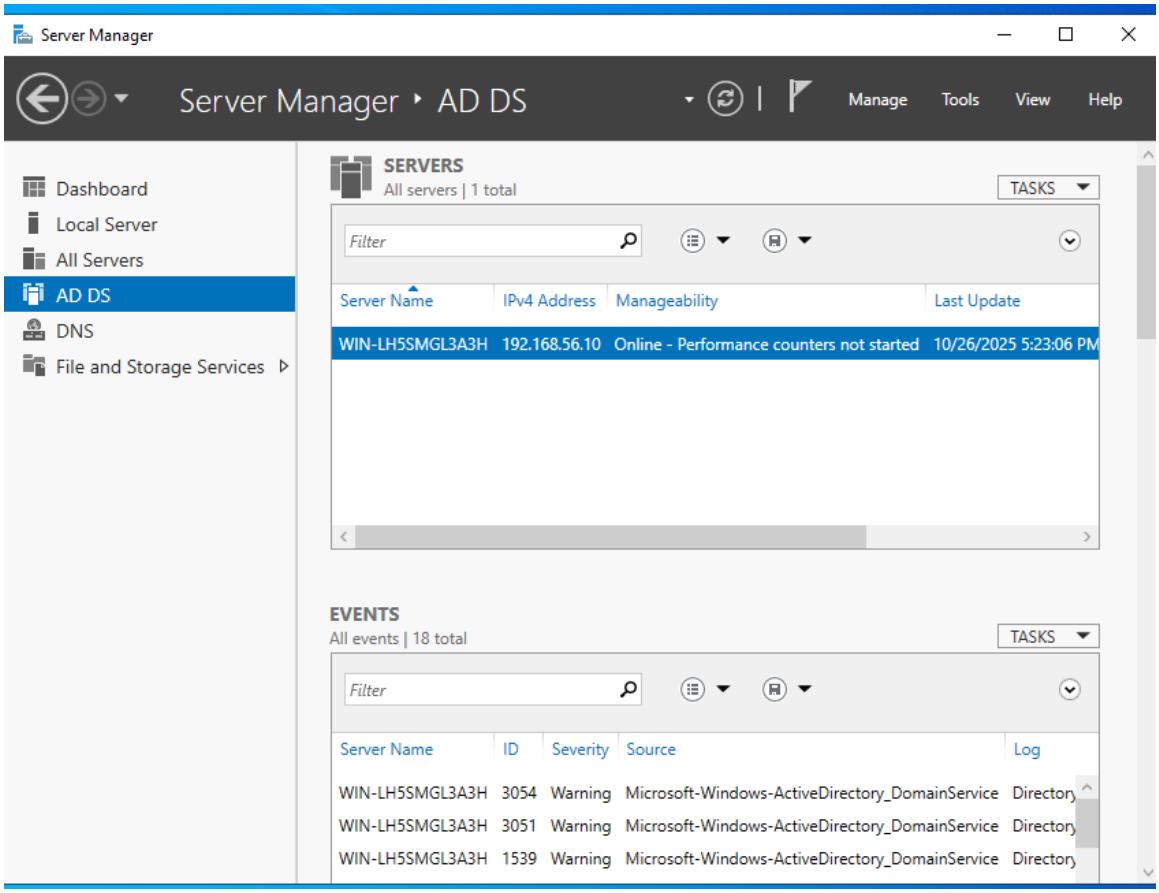
Description: Installed Windows Server 2022 Standard (Desktop Experience). After installation, the hostname was changed to SERVER01 and the system was rebooted. This server will act as the domain controller for the lab environment.

Step 3: Configure Static IP for Domain Controller



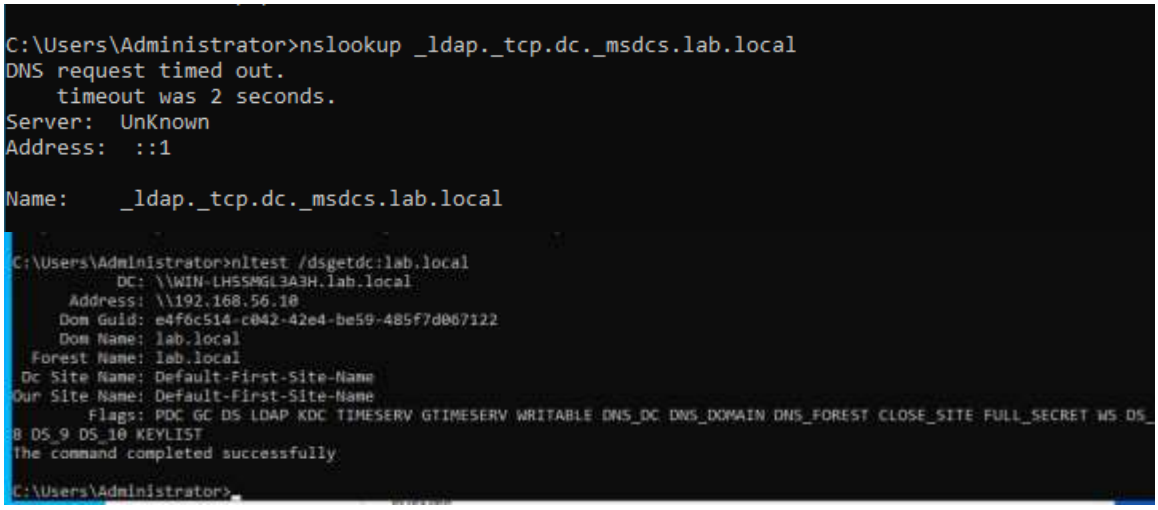
Description: In Network Connections (ncpa.cpl), the Host-Only adapter was assigned a static IP of 192.168.56.10 with subnet mask 255.255.255.0. DNS was set to 192.168.56.10 (self-reference). The NAT adapter remained on DHCP for internet connectivity. Verified connectivity using ping and ipconfig.

Step 4: Install AD DS + DNS and Promote to Domain Controller



Description: Through Server Manager → Add Roles and Features, installed Active Directory Domain Services (AD DS) and DNS Server roles. Promoted SERVER01 to a new forest with the root domain name lab.local. Set DSRM password, completed the wizard, and rebooted. Login now appears as LAB\Administrator.

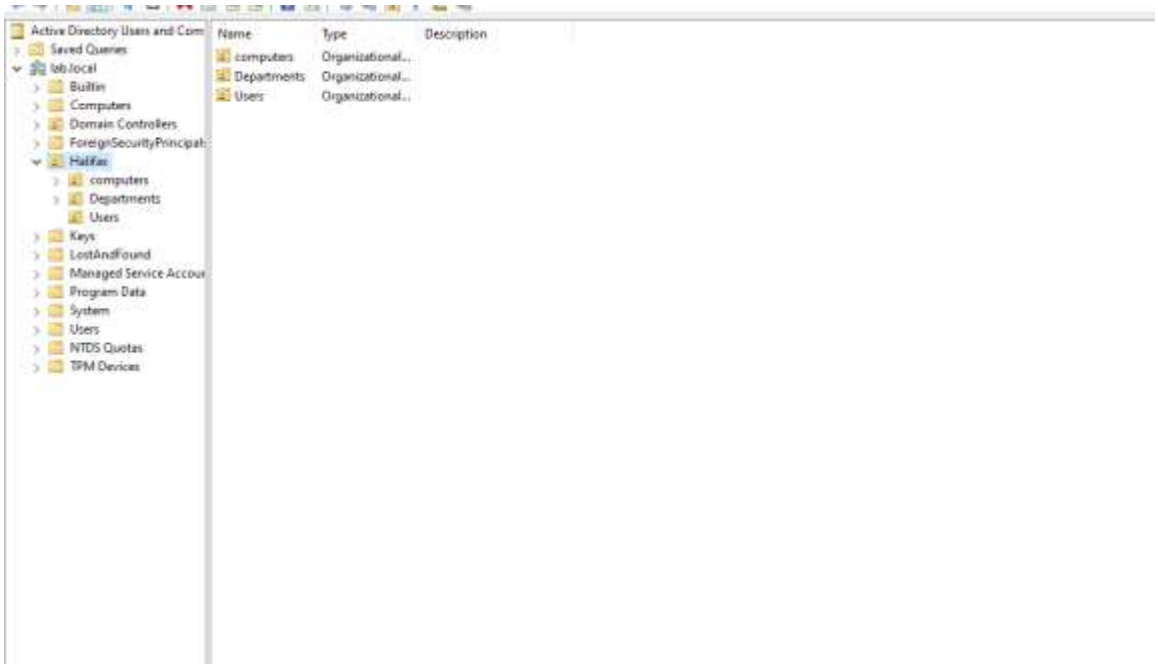
Step 5: Verify Domain Controller Health

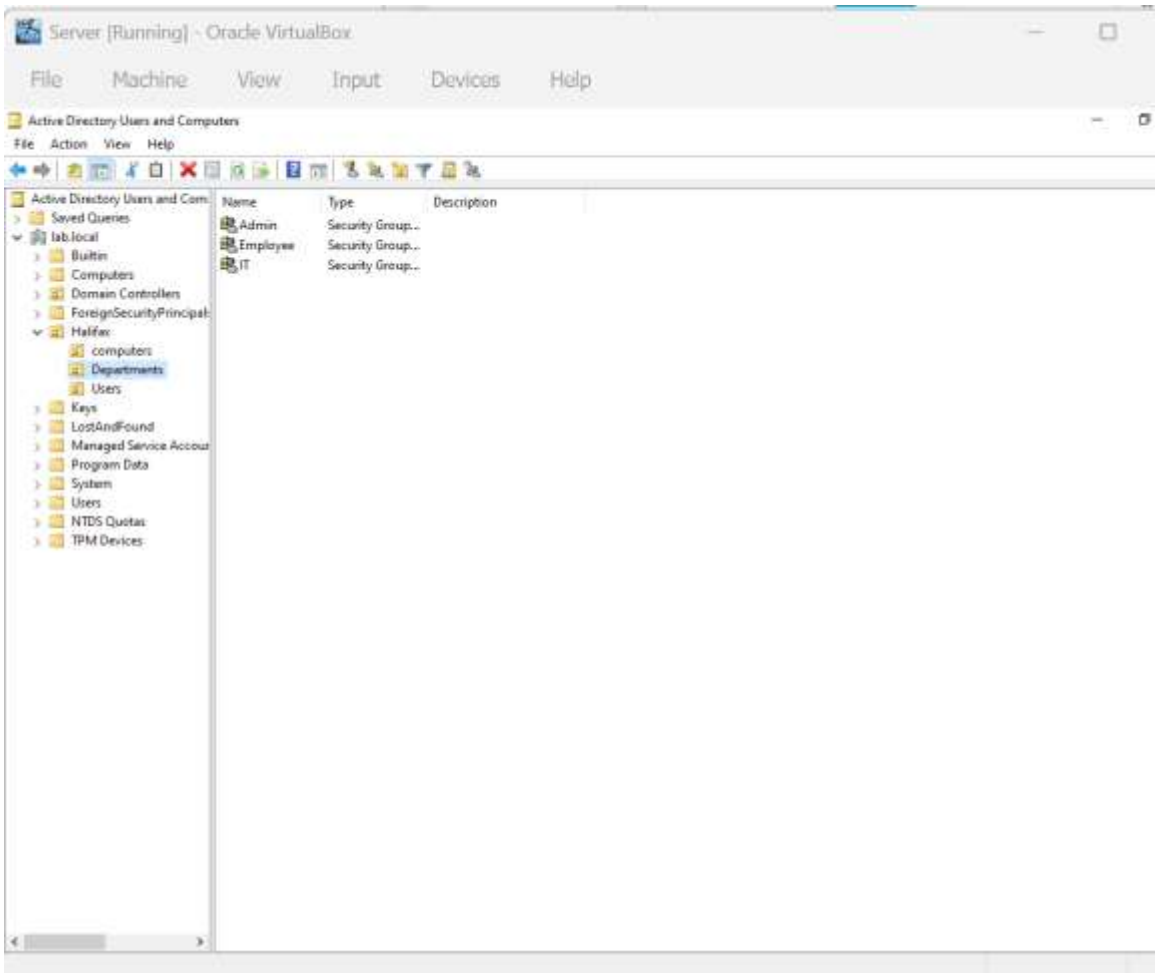


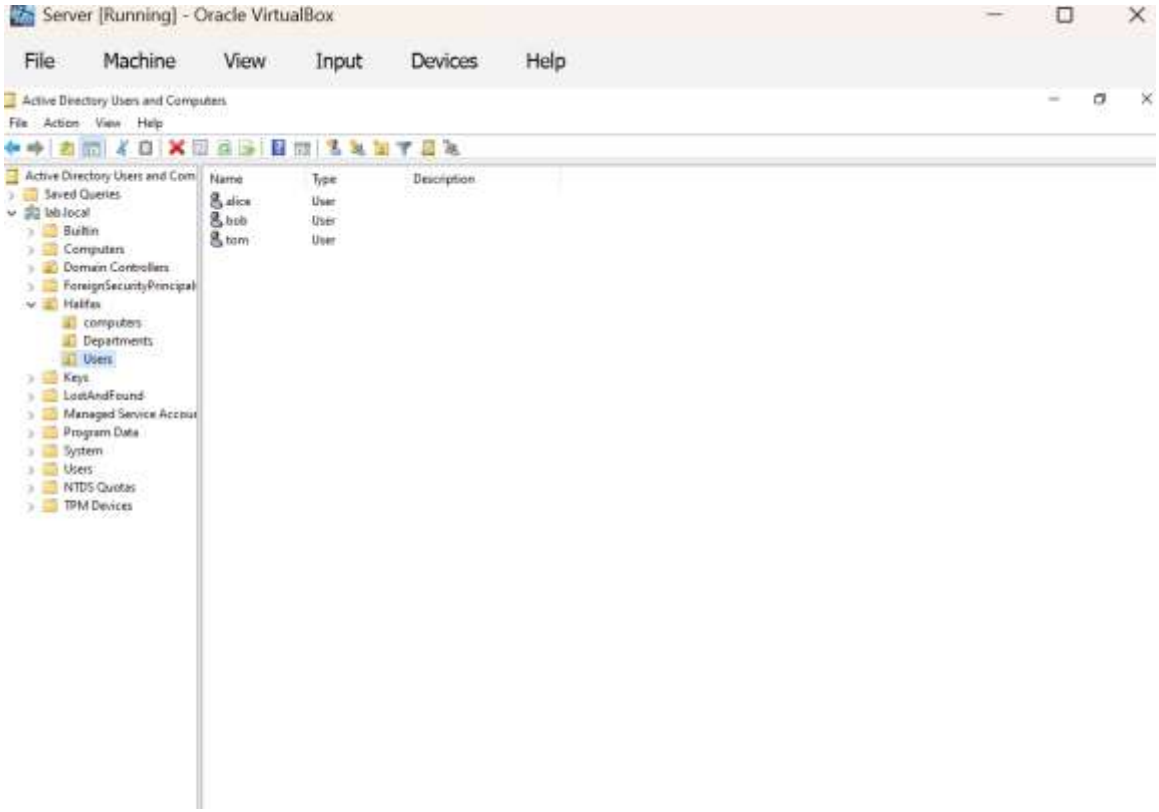
Description: Verified the AD installation using diagnostic commands: nslookup _ldap._tcp.dc._msdcs.lab.local and nltest /dsgetdc:lab.local confirmed proper domain resolution. Opened AD tools (gpmc.msc, dsa.msc) to ensure AD DS and DNS services were running correctly.

Step 6: Create Organizational Units (OU) and Users

📸 Screenshot Placeholder (Insert screenshot for this step).




Server [Running] - Oracle VirtualBox
File Machine View Input Devices Help
Active Directory Users and Computers
File Action View Help
Active Directory Users and Com
Saved Queries
lab.local
Builtin
Computers
Domain Controllers
ForeignSecurityPrincipal
Halifax
computers
Departments
Users
Keys
LostAndFound
Managed Service Accou
Program Data
System
Users
NTDS Quotas
TPM Devices
Name
Type
Description
Admin
Security Group...
Employee
Security Group...
IT
Security Group...



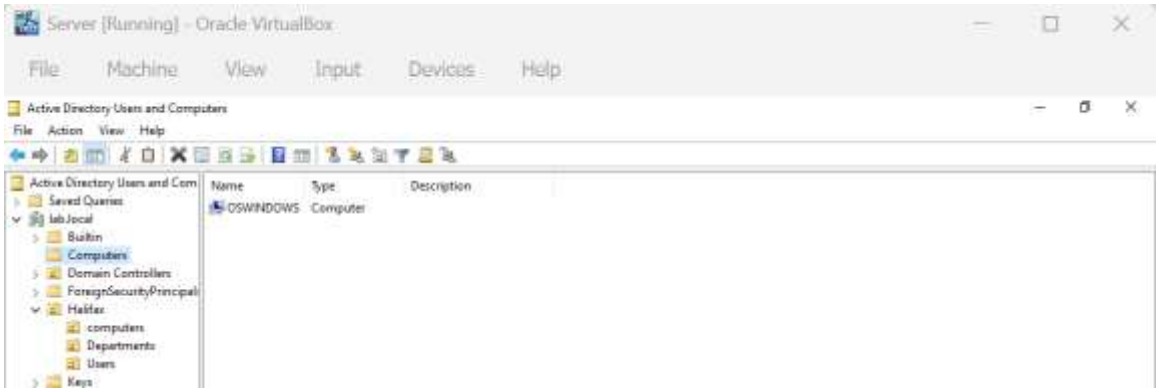
Description: In Active Directory Users and Computers (dsa.msc), created OUs for Departments, Users, and Computers. Under Departments, created IT, Employee, and Admin OUs. Created users alice (Admin) and bob (Employee), and added them to corresponding security groups.

Step 7: Configure Client Static IP

📸 Screenshot Placeholder (Insert screenshot for this step).

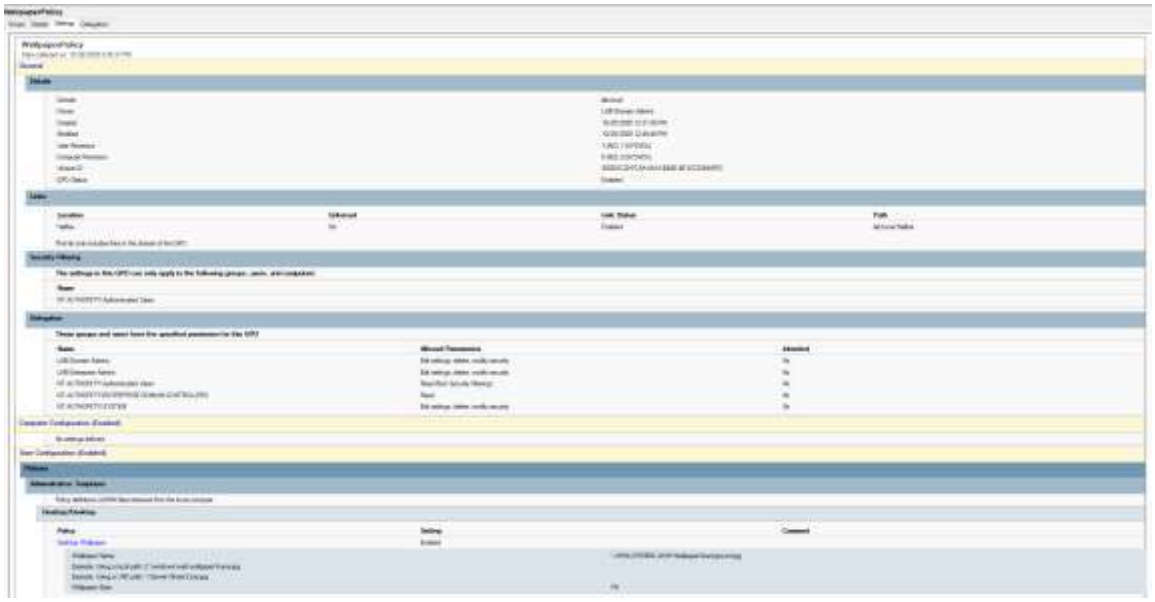
Description: Configured the Windows 11 client (WIN11) with Host-Only IP 192.168.56.20, subnet mask 255.255.255.0, and DNS 192.168.56.10. This allows the client to communicate with SERVER01 and resolve lab.local through the domain controller.

Step 8: Join Client to Domain



Description: On the Windows 11 client, changed the system domain to lab.local under System → About → Rename this PC (Advanced). Entered domain credentials LAB\Administrator. After rebooting, verified domain login with LAB\alice credentials.

Step 9: Deploy a Unified Wallpaper Policy via GPO



Description:
A new Group Policy Object (GPO) named **WallpaperPolicy** was created under the domain *lab.local*.
This policy enforces a unified desktop wallpaper for all domain users to maintain a consistent corporate appearance.

In **Group Policy Management Editor**, the following configuration was applied:

User Configuration → Administrative Templates → Desktop → Desktop → Desktop Wallpaper

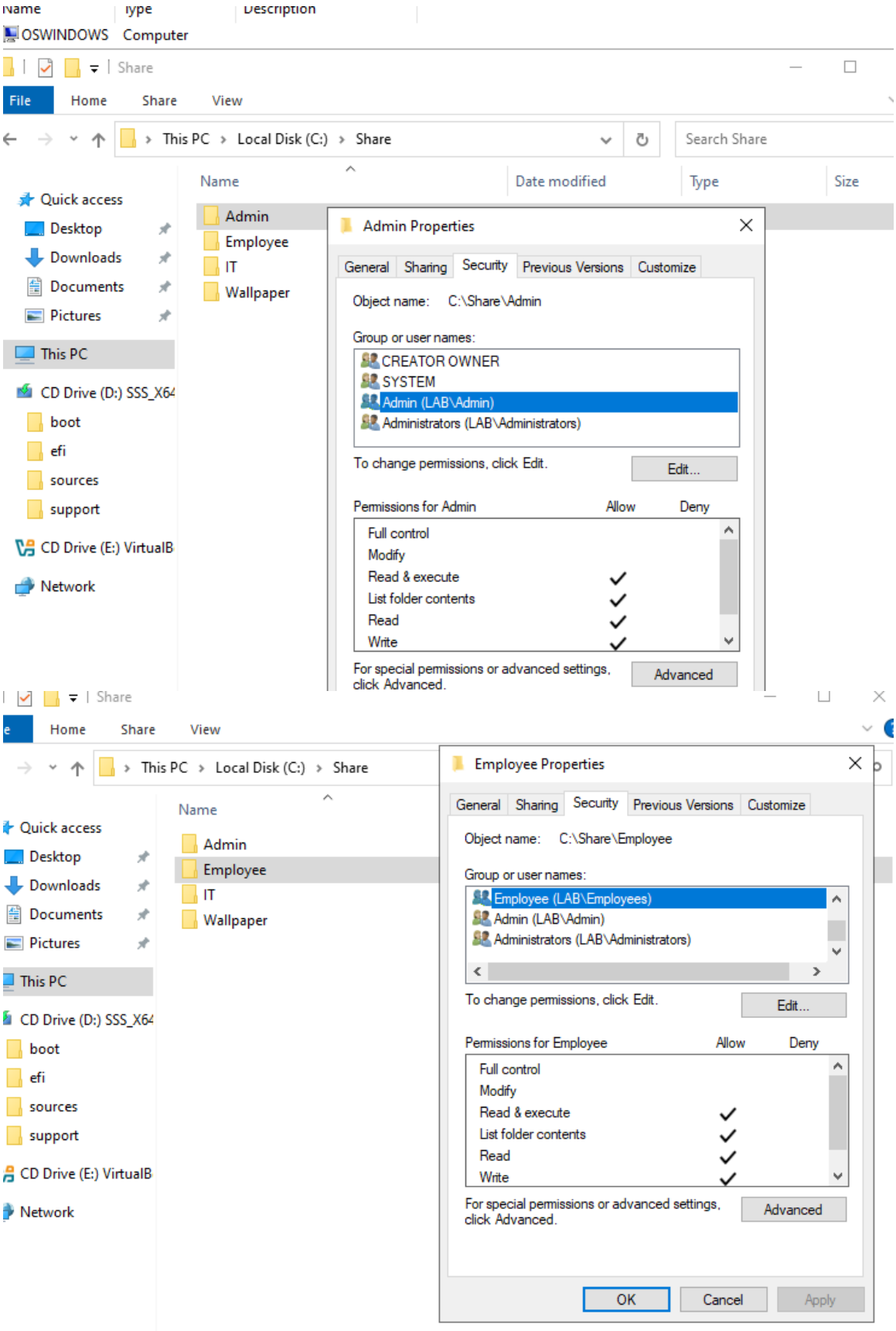
The wallpaper path was set to:

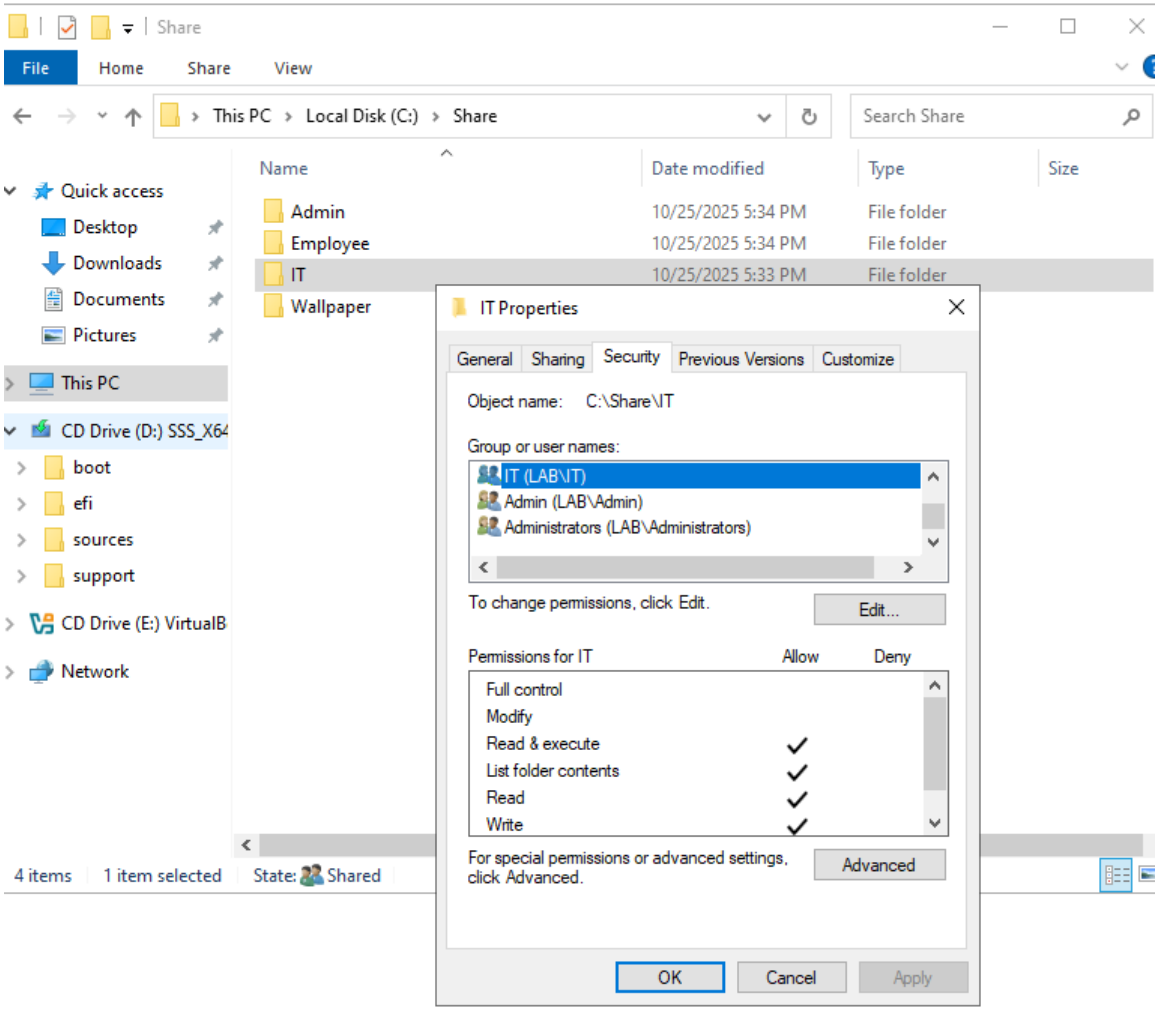
\\SERVER01\Wallpaper\background.jpg

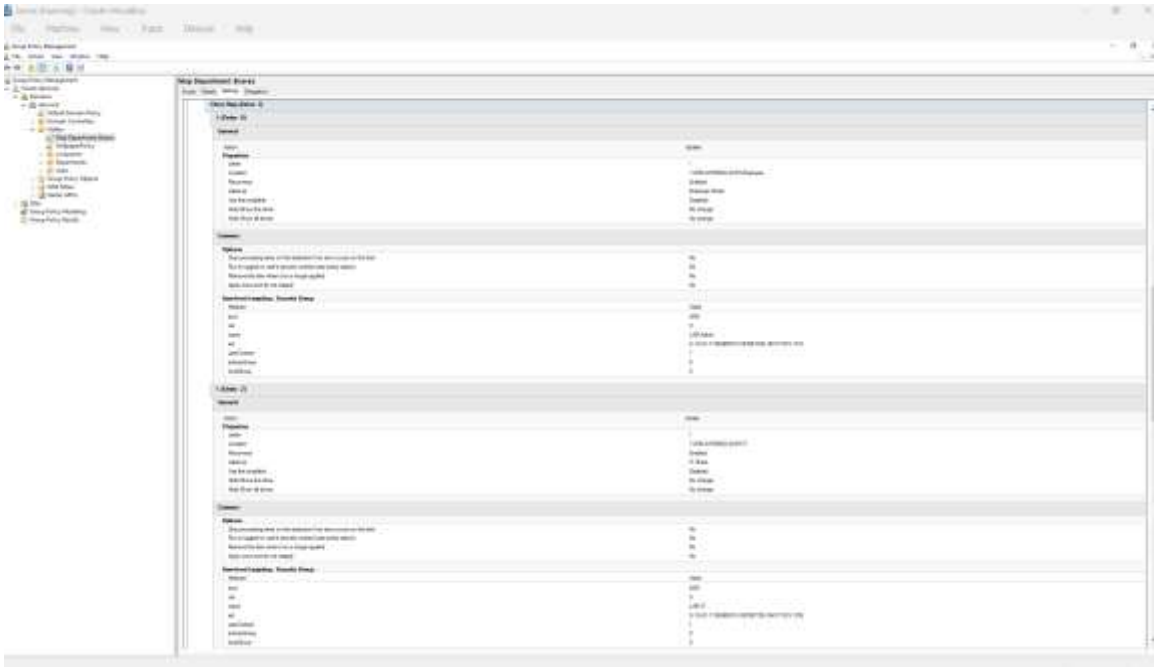
and the wallpaper style was set to **Fill**.

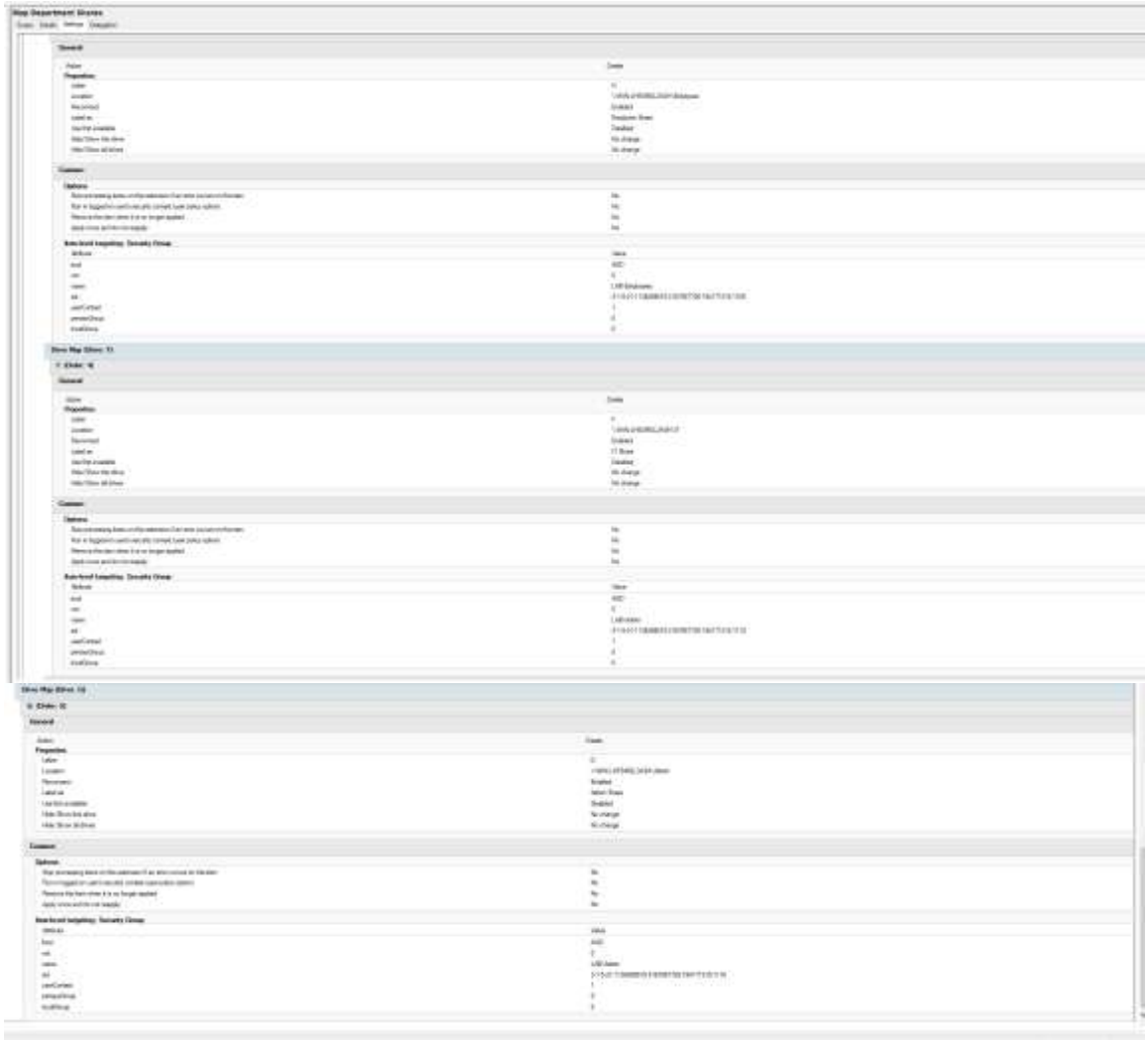
After running gpupdate /force on the client and re-logging in,
all domain users' desktops displayed the same background, confirming successful policy deployment.

Step 10: Set Up Shared Folders and Verify Permissions


Name
Type
Description
OSWINDOWS
Computer
Share
File
Home
Share
View
This PC
Local Disk (C:)
Share
Search Share
Quick access
Desktop
Downloads
Documents
Pictures
This PC
CD Drive (D:) SSS_X64
boot
efi
sources
support
CD Drive (E:) VirtualB
Network
Name
Date modified
Type
Size
Admin
Employee
IT
Wallpaper
Admin Properties
General
Sharing
Security
Previous Versions
Customize
Object name: C:\Share\Admin
Group or user names:
CREATOR OWNER
SYSTEM
Admin (LAB\Admin)
Administrators (LAB\Administrators)
To change permissions, click Edit.
Edit...
Permissions for Admin
Allow
Deny
Full control
Modify
Read & execute
List folder contents
Read
Write
For special permissions or advanced settings, click Advanced.
Advanced
Employee Properties
Object name: C:\Share\Employee
Employee (LAB\Employees)
Admin (LAB\Admin)
Administrators (LAB\Administrators)
Permissions for Employee
OK
Cancel
Apply

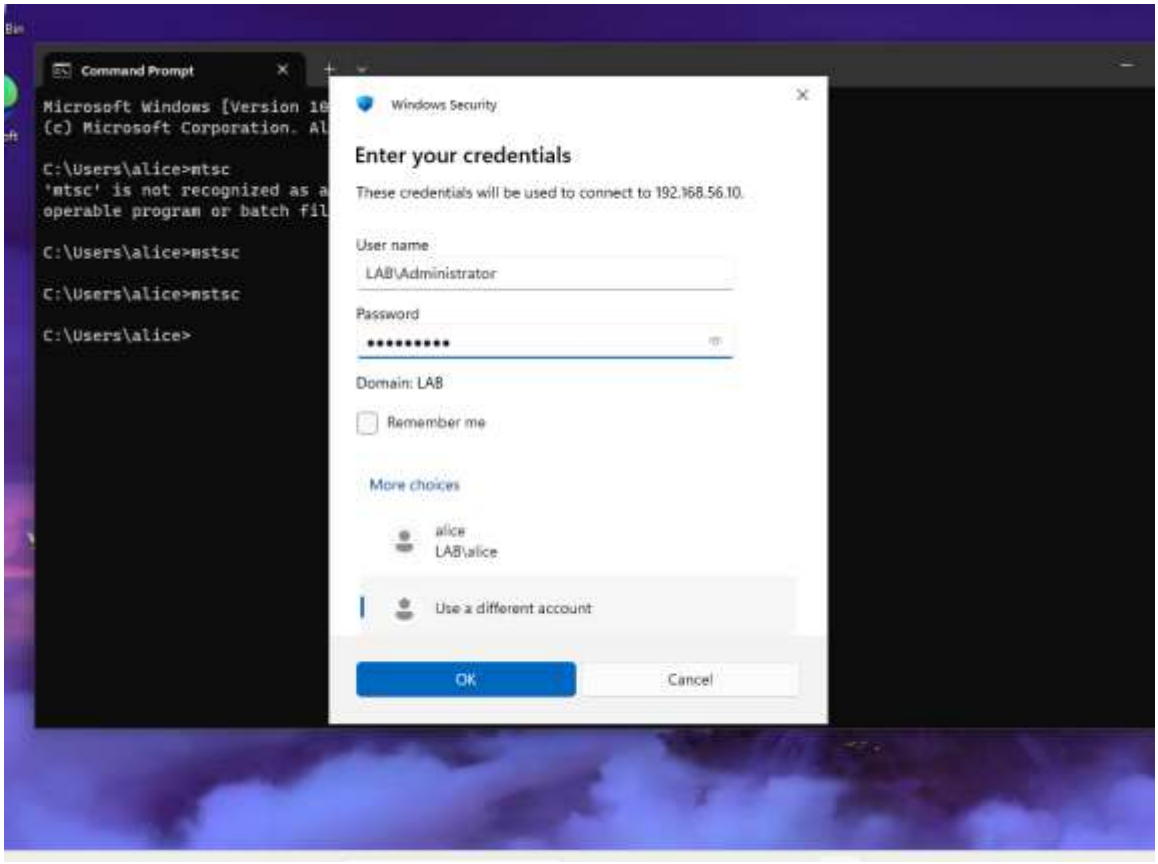

Share
File
Home
Share
View
This PC
Local Disk (C:)
Share
Search Share
Quick access
Desktop
Downloads
Documents
Pictures
This PC
CD Drive (D:) SSS_X64
boot
efi
sources
support
CD Drive (E:) VirtualB
Network
Name
Date modified
Type
Size
Admin
10/25/2025 5:34 PM
File folder
Employee
10/25/2025 5:34 PM
File folder
IT
10/25/2025 5:33 PM
File folder
Wallpaper
4 items
1 item selected
State: Shared
IT Properties
General
Sharing
Security
Previous Versions
Customize
Object name: C:\Share\IT
Group or user names:
IT (LAB\IT)
Admin (LAB\Admin)
Administrators (LAB\Administrators)
To change permissions, click Edit.
Edit...
Permissions for IT
Allow
Deny
Full control
Modify
Read & execute
List folder contents
Read
Write
For special permissions or advanced settings, click Advanced.
Advanced
OK
Cancel
Apply

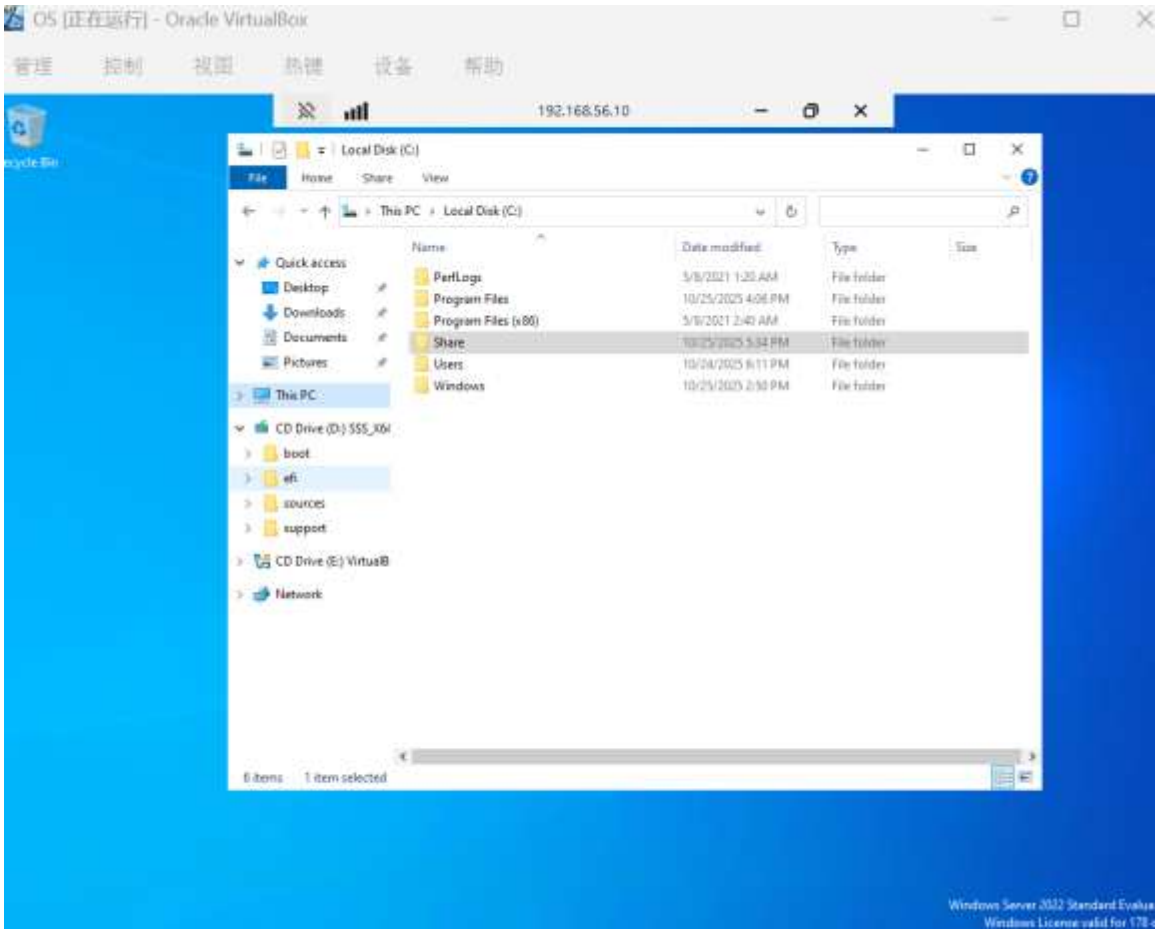




Description: Created shared folders D:\Share\IT and D:\Share\HR on DC. Configured Share and NTFS permissions — IT folder accessible only to IT group and Admin group, Employee folder accessible only to Employee group and Admin group, Admin folder only to Admin group. On the client, \ WIN-LH5SMGL3A3H \IT, \ WIN-LH5SMGL3A3H \Admin, and \ WIN-LH5SMGL3A3H \Employee verified correct access isolation between groups.

Step 11: Enable Remote Desktop Access





Description: Enabled Remote Desktop under System → Remote Desktop → Allow remote connections to this computer. Firewall automatically opened TCP port 3389. Verified service status using netstat -an | find "3389". From the host or client machine, connected to SERVER01 via mstsc using LAB\Administrator credentials.

Appendix A: Command Summary

Command	Description
ipconfig /all	Display all network configuration details.
ping 192.168.56.10	Test connectivity with the domain controller.
nslookup lab.local	Verify DNS resolution for the domain.
nltest /dsgetdc:lab.local	Retrieve information about the domain controller.
gpupdate /force	Force immediate Group Policy update.
net use	List all mapped network drives.
netstat -an | find "3389"	Check if Remote Desktop (RDP) service is listening.

Appendix B: Summary and Reflection

- ✅ Successfully deployed a Windows Server 2022 Active Directory domain environment.
- ✅ Client successfully joined the domain and authenticated with domain credentials.
- ✅ Group Policy Objects (GPOs) were successfully applied and verified.
- ✅ File sharing permissions were properly configured and enforced per department.
- ✅ Remote Desktop access to the domain controller was successfully enabled.

Through this lab, I gained hands-on experience in setting up and managing a Windows domain environment. I learned how to integrate DNS, AD DS, Group Policy, and file-sharing permissions within an enterprise network. This exercise demonstrated how to securely manage users and systems within an organizational infrastructure.