TOPIC: IMPLEMENTING ENTERPRISE STORAGE SOLUTIONS

Objective:

- Plan storage solutions based on organizational requirements.
- Configure iSCSI storage with multiple access paths.
- Implement Multipath I/O (MPIO) for redundancy.
- Configure SMB and NFS shares for Windows and Linux clients.
- Manage and secure the share infrastructure.

Pre-requisites:

- Virtual Machines:
    - **LON-DC1** – Domain Controller (Windows Server 2016).
    - **LON-SVR1** – Member server for storage configuration.
    - **LON-SVR2** – Additional server (if needed for lab).
    - **LON-CL1** – Windows 10 client.
    - **LON-RHEL** – Linux system (used for NFS testing).
- Active Directory domain configured.
- User credentials:
    - Username: Administrator
    - Password: Pa$$w0rd

Procedure:

Exercise 1: Planning Storage Requirements

1. Evaluated available solutions: iSCSI, Fibre Channel, InfiniBand.
    - Chosen: **iSCSI** (low cost, reasonable performance).
2. Storage type for SQL Databases → **Block-level storage** preferred (although SMB 3.0 also supported).

3. Minimized administrative overhead by avoiding Fibre Channel/InfiniBand complexity.
4. Provisioning for VMware VMs → **NFS role** can be used.
5. Hyper-V VMs must run on **SMB shares** (NFS not supported).
6. UNIX clients access → **NFS** or **SMB** depending on existing infrastructure.
7. Disabled legacy SMB1 using PowerShell:

```
Get-SmbServerConfiguration | Select EnableSMB1Protocol
Set-SmbServerConfiguration -EnableSMB1Protocol $false
```

Result: A storage solution plan created with iSCSI for low-cost and scalable performance.

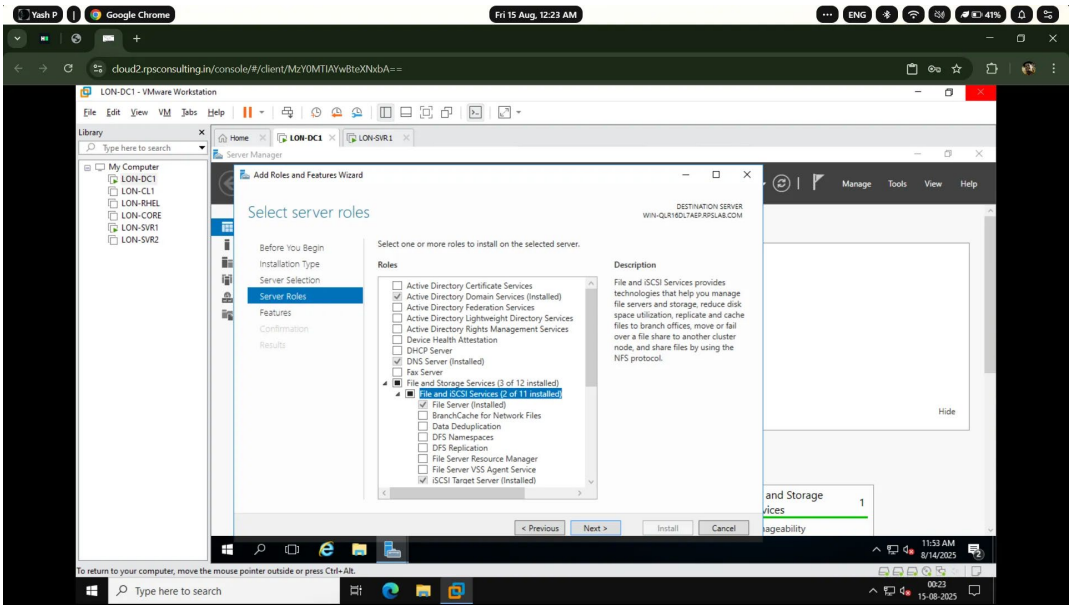
Exercise 2: Configuring iSCSI Storage

Task 1: Enable Network Adapters
On both **LON-DC1** and **LON-SVR1**, run:

```
Get-NetAdapter | Enable-NetAdapter
```

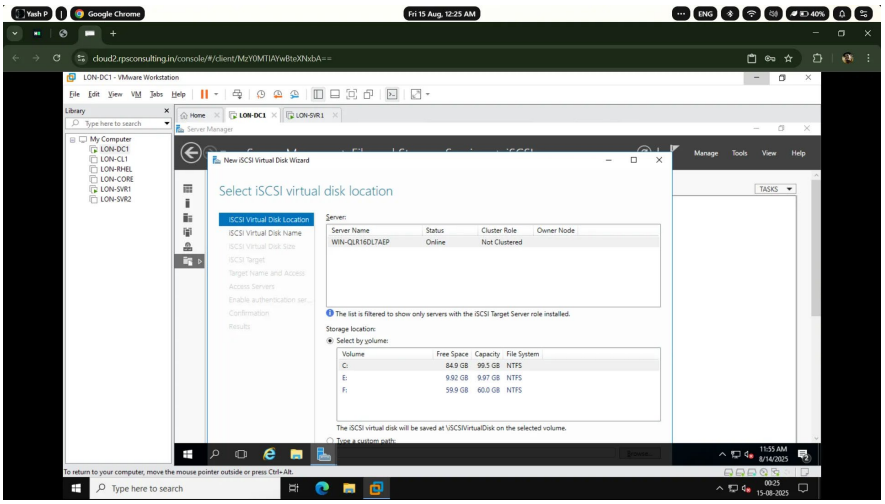
Task 2: Install iSCSI Target Feature (on LON-DC1)

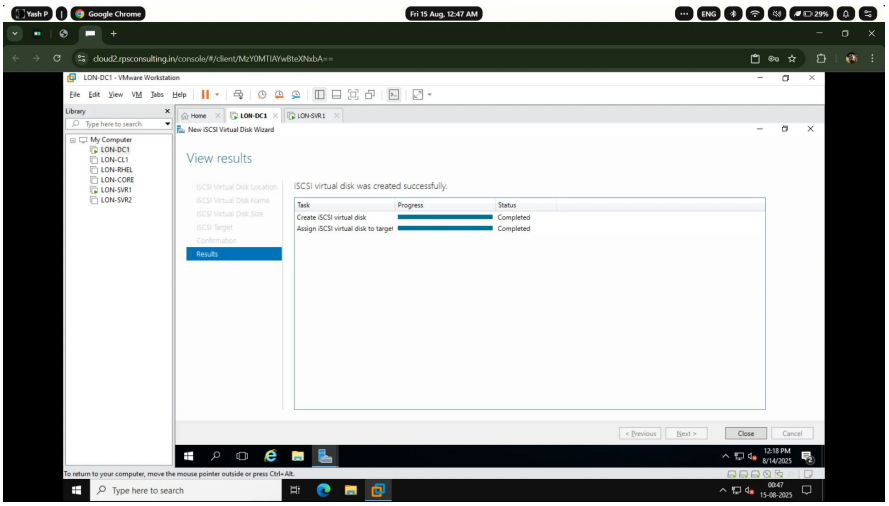
- Open Server Manager → Add Roles and Features → File and iSCSI Services → Enable **iSCSI Target Server**.

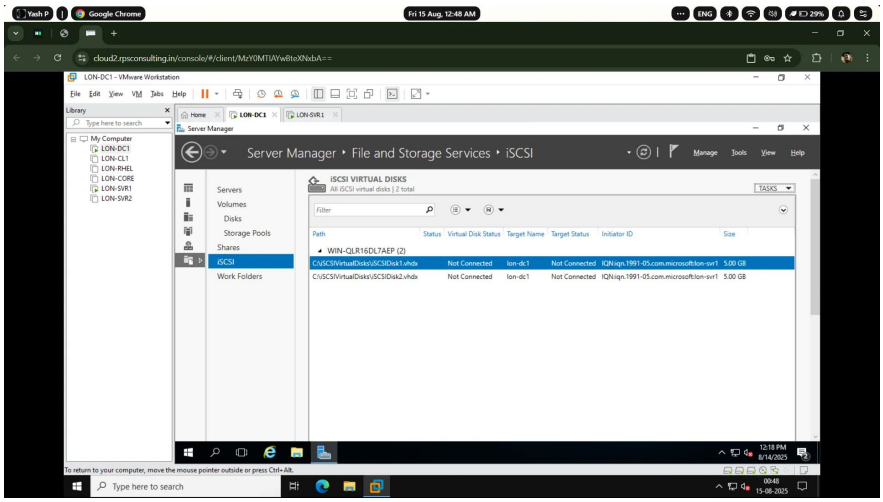


Task 3: Create and Configure iSCSI Target

- From Server Manager → File and Storage Services → iSCSI.
- Create virtual disks: **iSCSIDisk1 (5 GB)** and **iSCSIDisk2 (5 GB)**.
- Assign them to initiator servers by IP (e.g., 10.100.100.3 and 10.200.100.3).

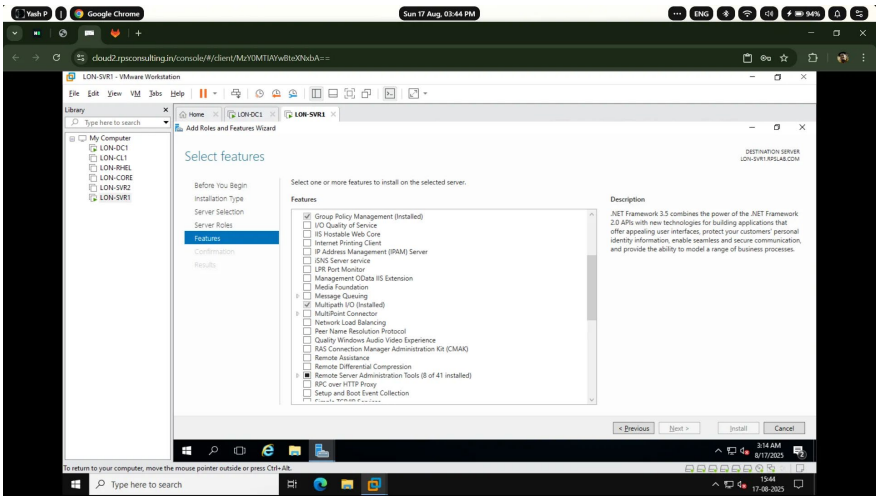


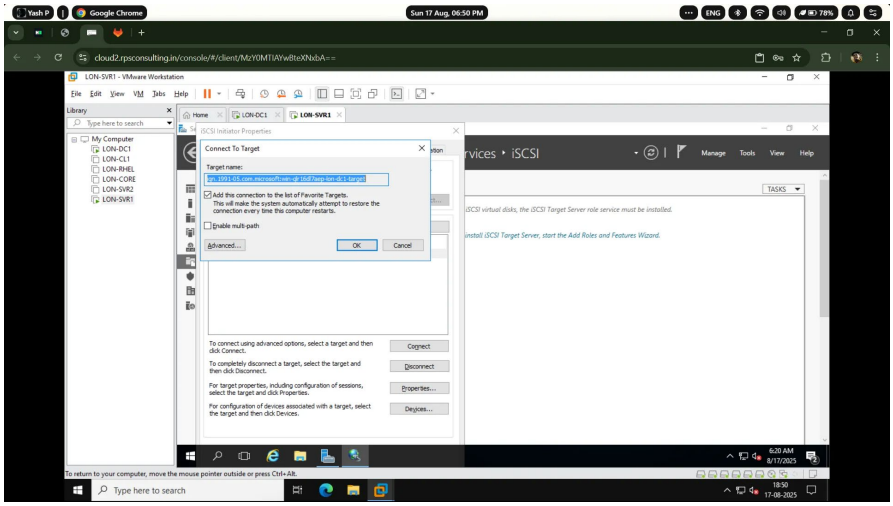


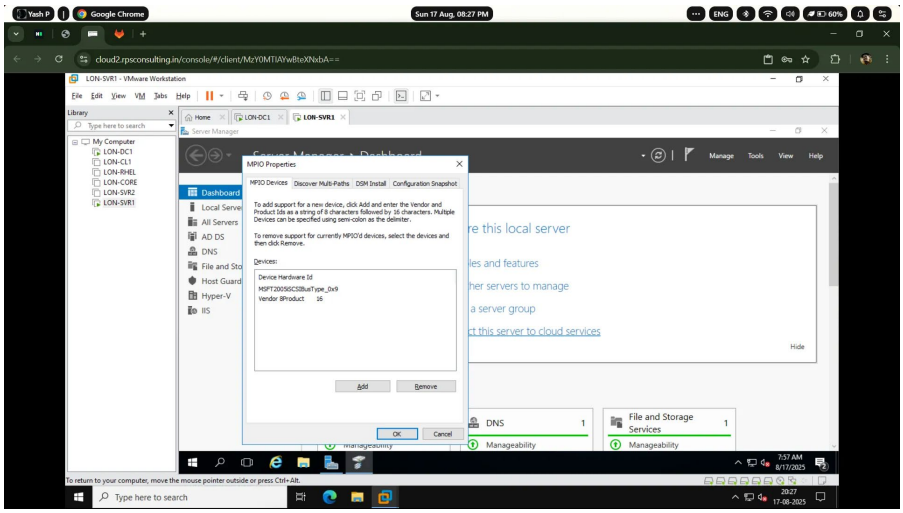


Task 4: Configure Multipath I/O (on LON-SVR1)

- Add Windows Feature: **Multipath I/O**.
- Enable MPIO for iSCSI devices.
- Restart server and confirm MPIO is enabled.

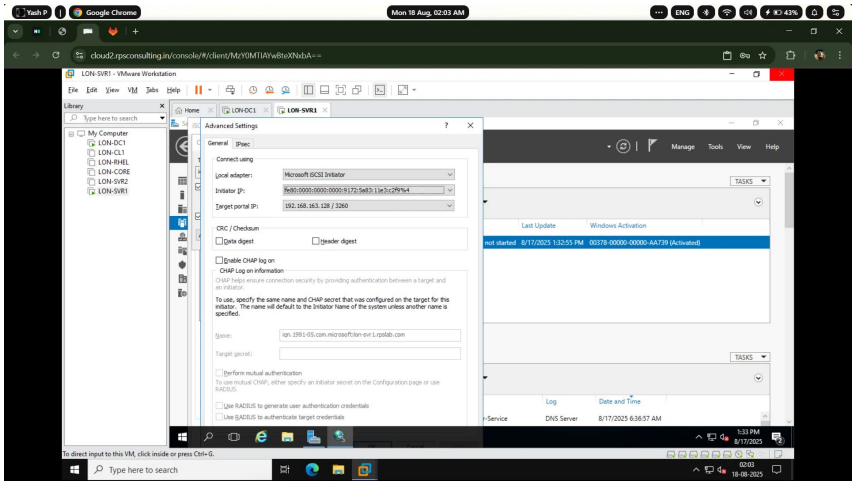


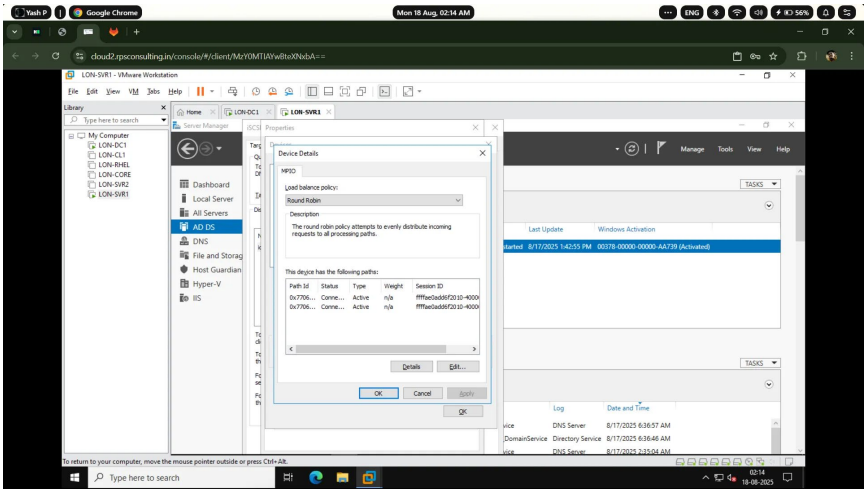


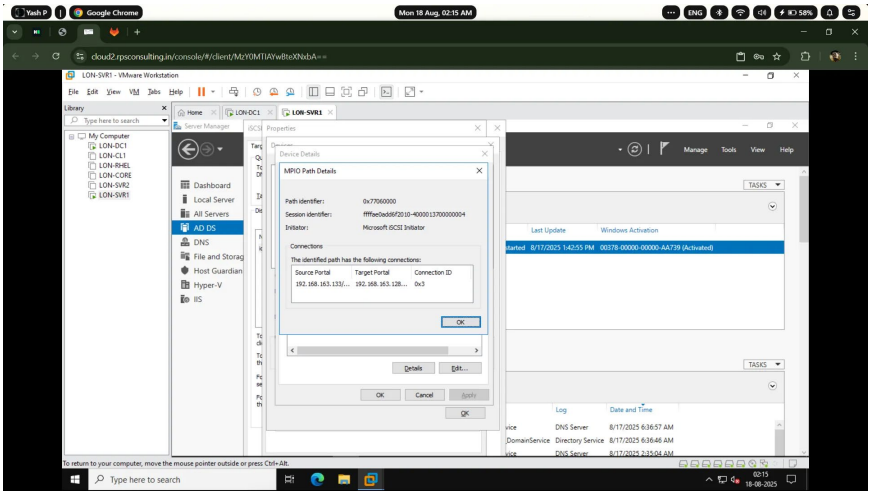


Task 5: Connect to iSCSI Target (from LON-SVR1)

- Use **iSCSI Initiator** tool.
- Connect to both target portals (10.100.100.2 and 10.200.100.2).
- Enable multi-path option.
- Verify 2 paths available with load balancing policy = Round Robin.



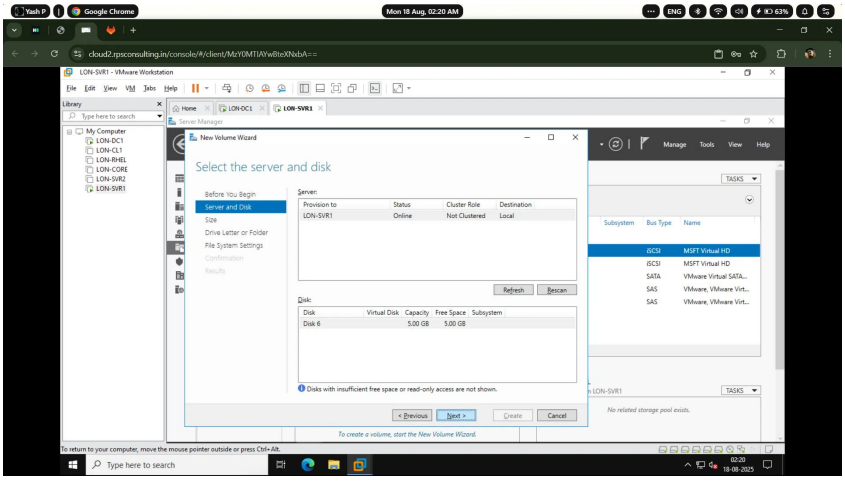


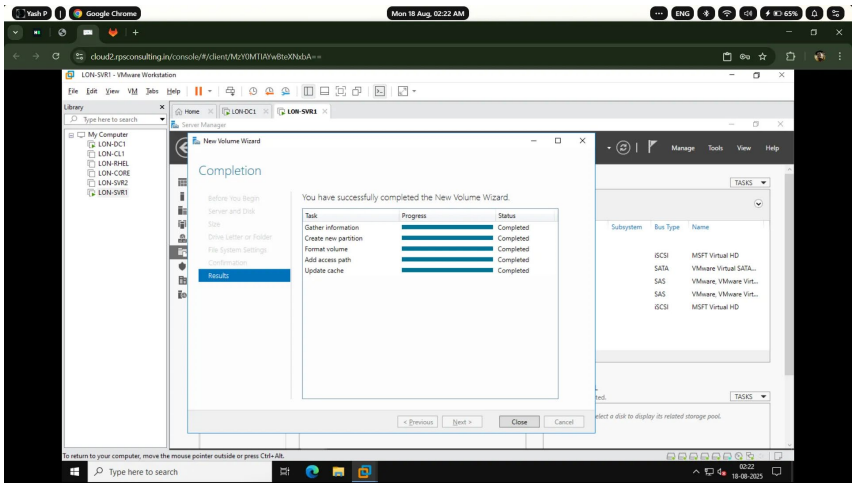


Task 6: Initialize iSCSI Disks (from LON-SVR1)

- Bring disks online.
- Create volumes:
    - **J:** SMB Shares (label: SMBShares).
    - **K:** NFS Shares (label: NFSShares).

Result: Successfully configured iSCSI target with redundancy (MPIO) and provisioned storage volumes.



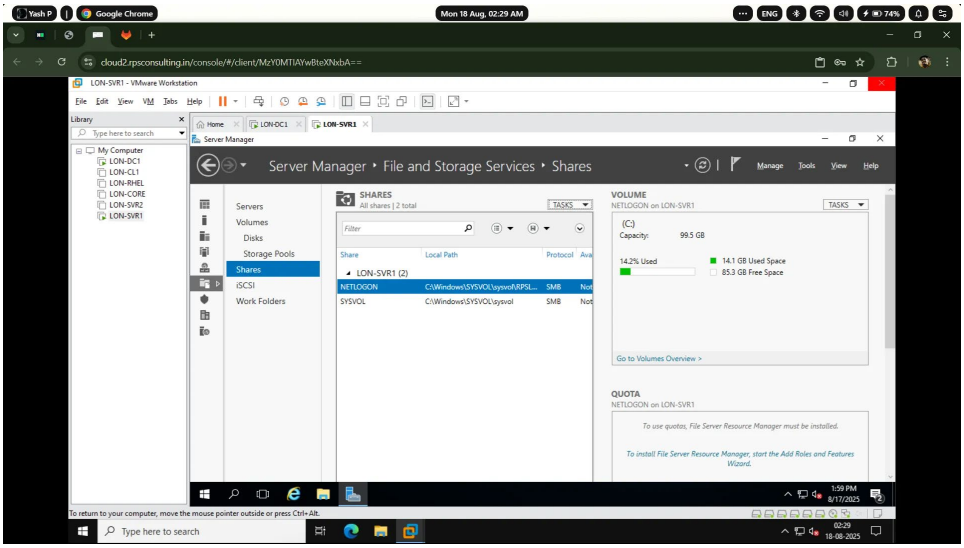


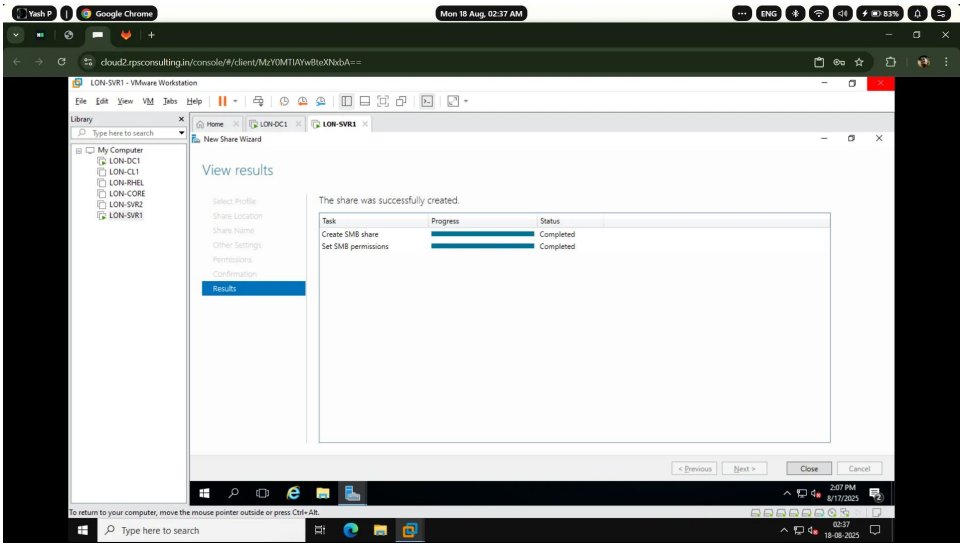
Exercise 3: Configuring and Managing Share Infrastructure

Task 1: Create SMB Share (Windows Access)

- On LON-SVR1, create SMB Share – Quick on **J:** drive.
- Name: **Data**.
- Enable Access-based Enumeration.

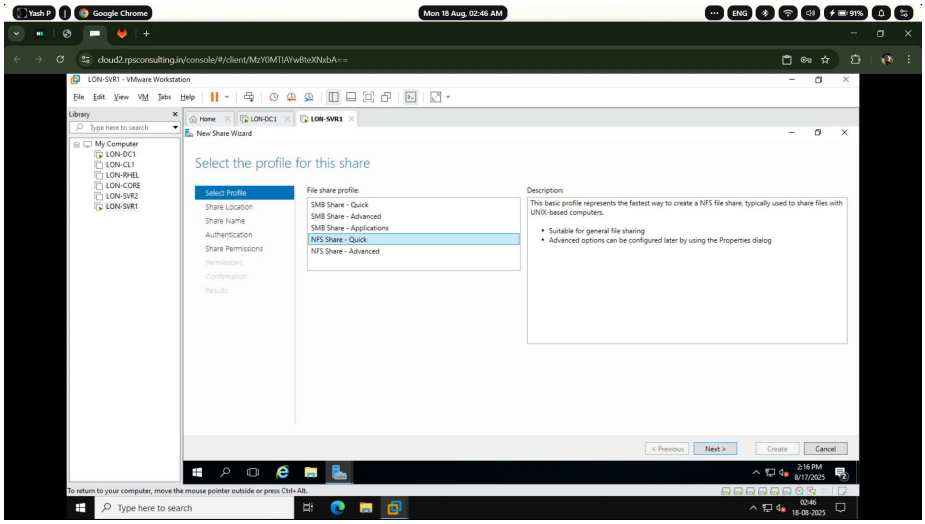
- Set permissions for **Domain Users** with Modify rights.

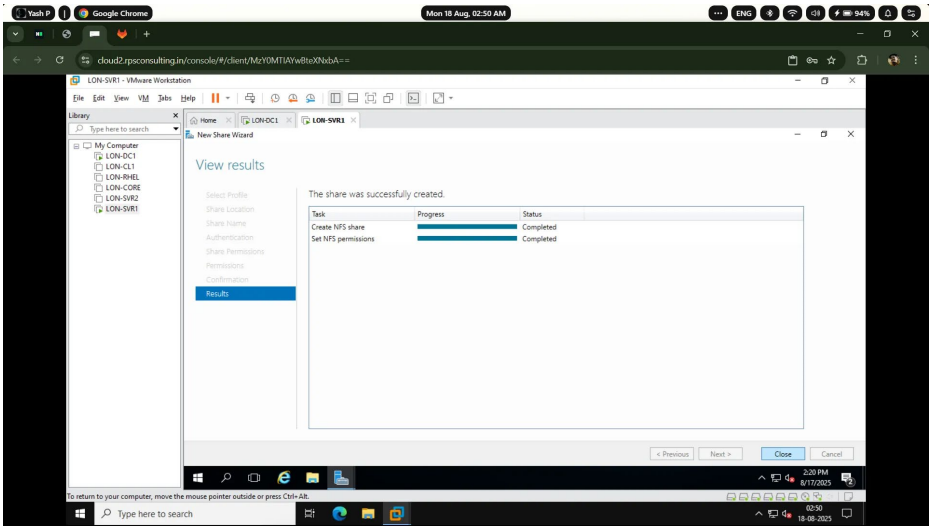




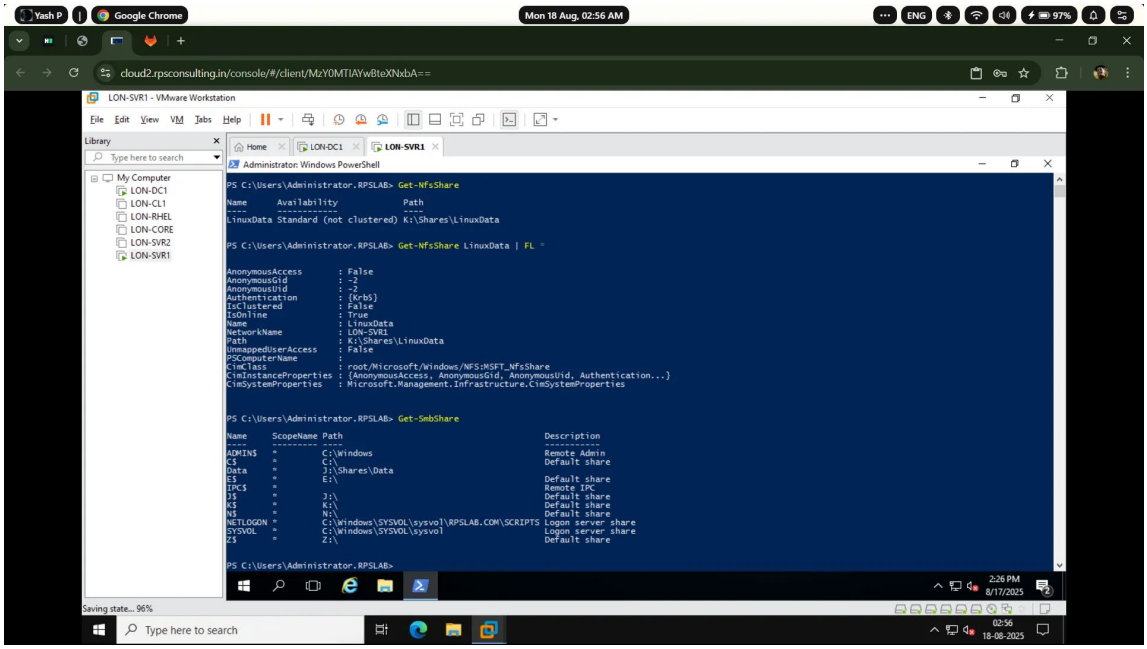
Task 2: Create NFS Share (Linux Access)

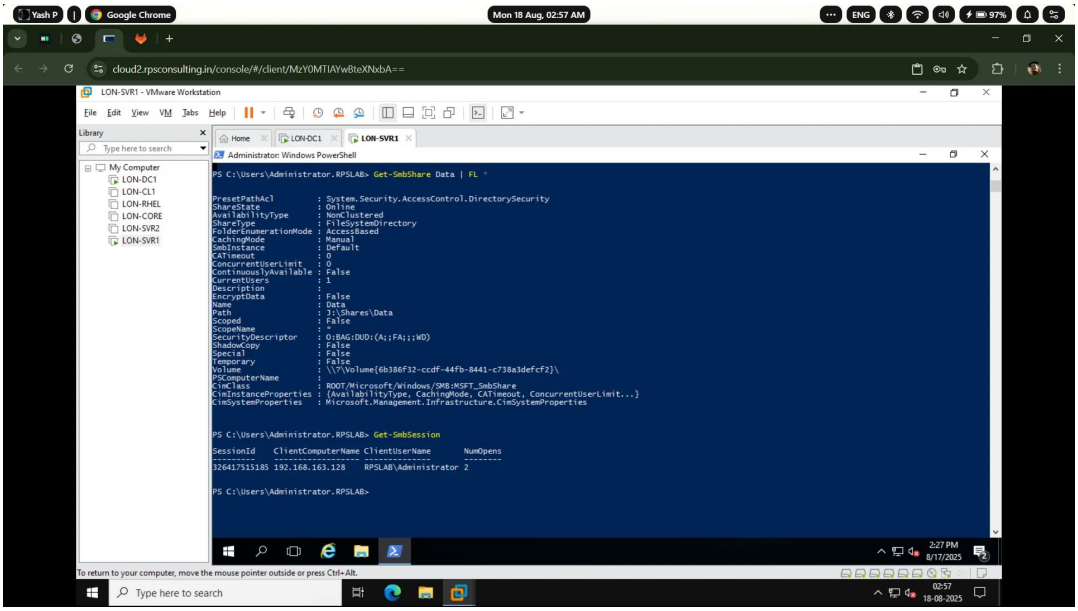
- On **K:** drive → Create NFS Share – Quick.
- Name: **LinuxData**.
- Authentication: Kerberos v5.
- Permissions: All Machines → Read/Write.

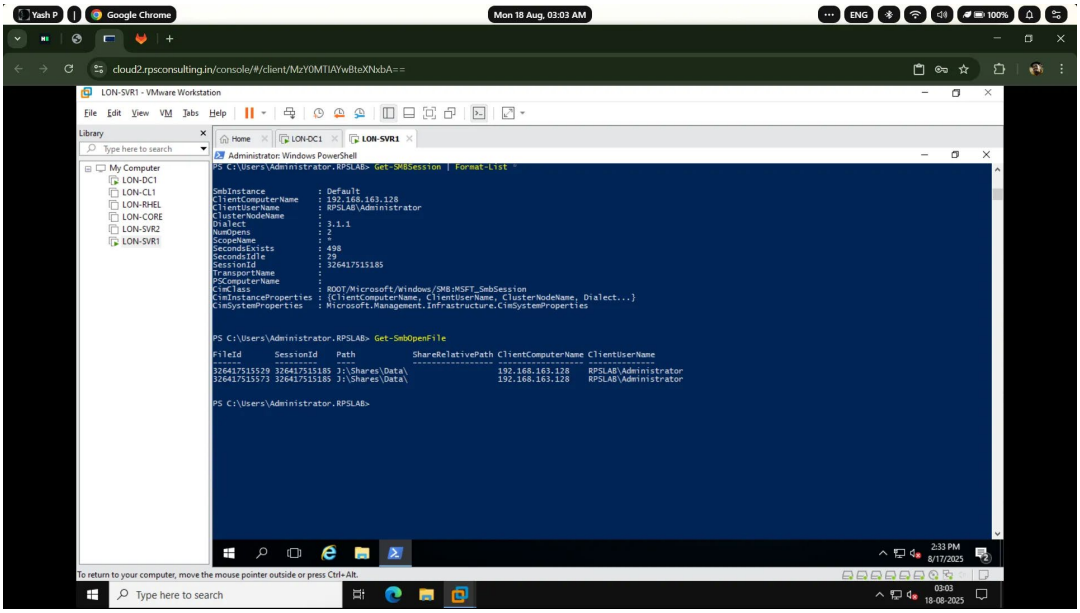




Task 3: View Share Information with PowerShell





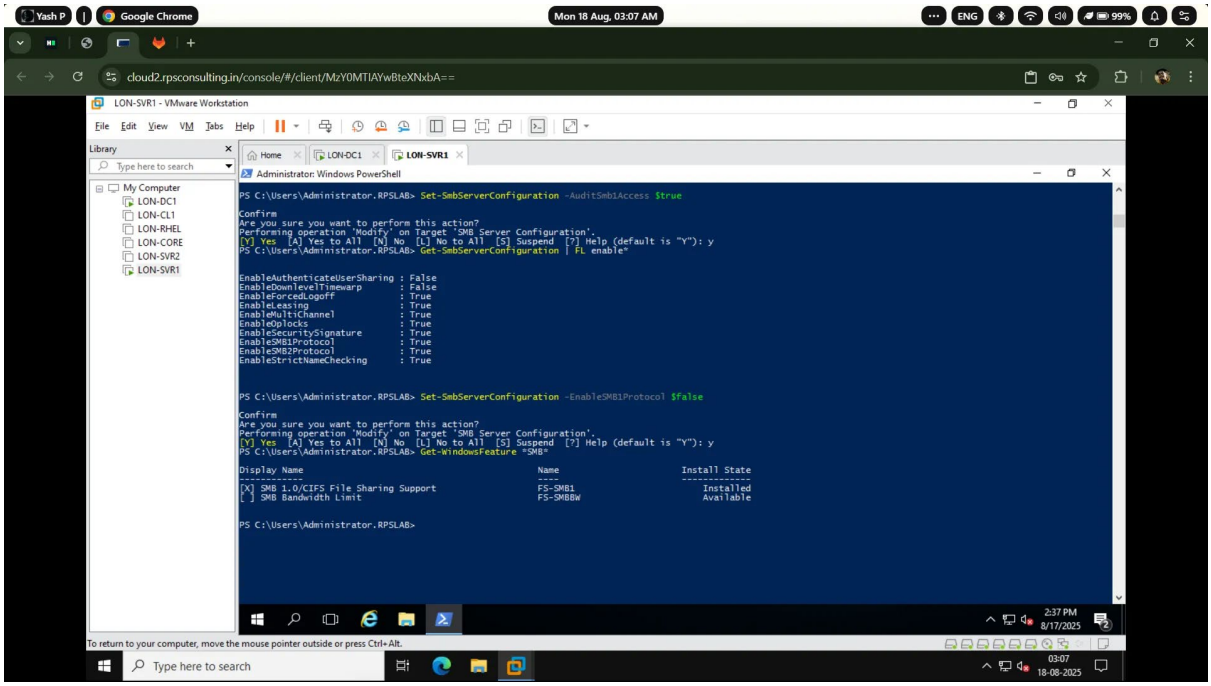


Task 4: Disable Legacy SMB1 Protocol

```
Set-SmbServerConfiguration -EnableSMB1Protocol $false

Remove-WindowsFeature FS-SMB1
```

Result: Configured both SMB and NFS shares, validated sessions, and secured shares by disabling legacy SMB1.



Conclusion

By completing this lab, we:

- Planned and designed a suitable storage architecture.
- Configured **iSCSI target with multipath redundancy** for high availability.
- Created and tested **SMB and NFS shares** for both Windows and Linux clients.
- Secured infrastructure by disabling legacy SMB1.

Thus, Module 3 demonstrated how to implement enterprise-grade storage solutions in Windows Server 2016.