TOPIC: IMPLEMENTING STORAGE SPACES AND DATA DEDUPLICATION

Objective:

- Configure and manage **Storage Pools** and **Storage Spaces**.
- Create and manage **virtual disks** with different resiliency options.
- Implement **Data Deduplication** to optimize disk usage.
- Validate configuration using PowerShell and GUI tools.

Pre-requisites:

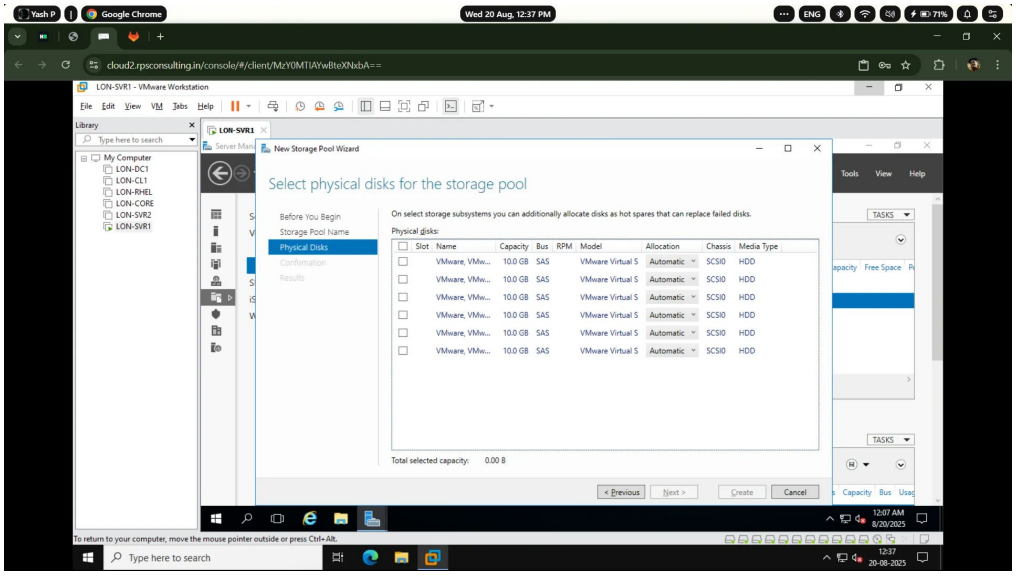
- Virtual Machines:
  - **LON-DC1** – Domain Controller (Windows Server 2016).
  - **LON-SVR1** – Windows Server 2016 (for storage pool and deduplication).
- At least **three available disks** (unallocated) on LON-SVR1.
- User credentials:
  - Username: Administrator
  - Password: Pa$$w0rd

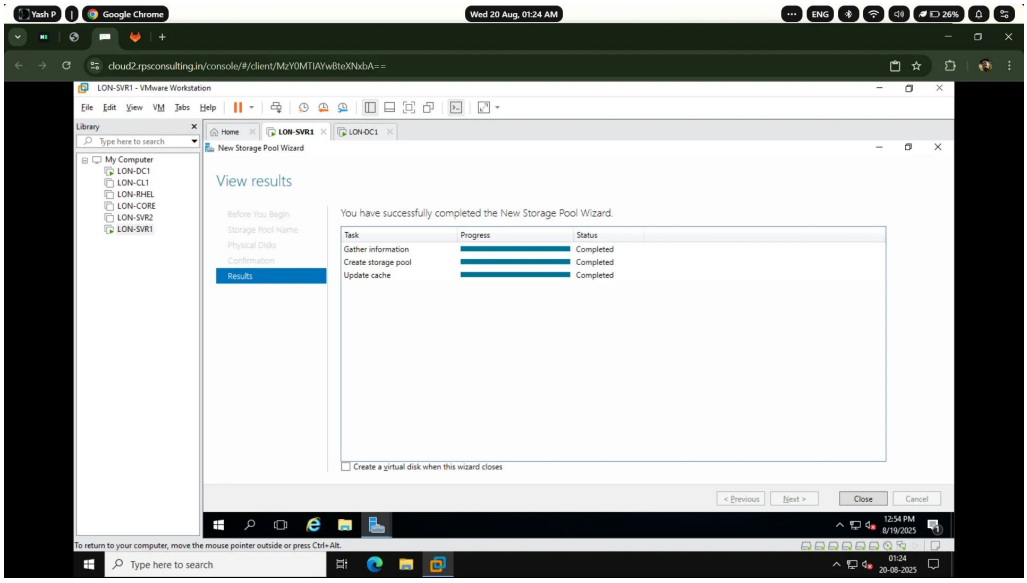
Procedure:

Exercise 1: Creating and Managing Storage Pools

Task 1: Create a Storage Pool

1. On **LON-SVR1**, open **Server Manager** → File and Storage Services → Storage Pools.
2. Select **Primordial pool**, create new pool → Name: **StoragePool1**.
3. Select three physical disks (e.g., Disk 2, Disk 3, Disk 4).
4. Verify pool creation.



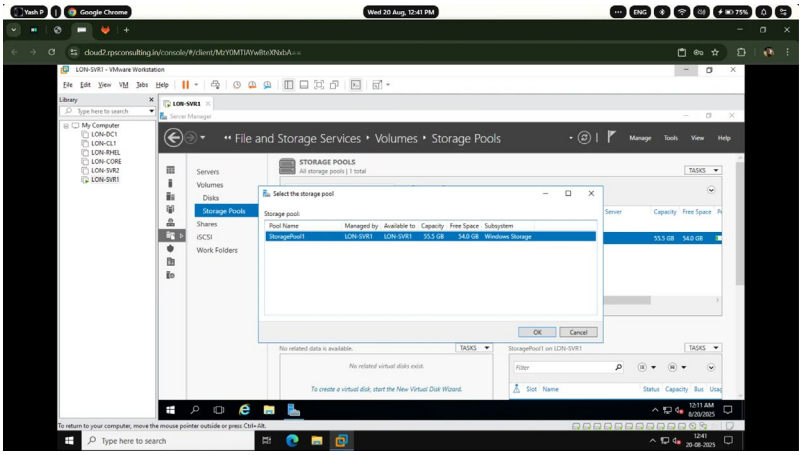


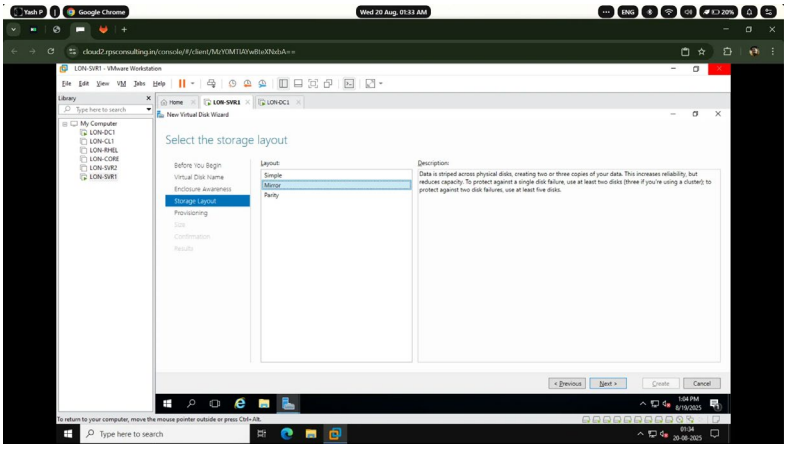
Task 2: Create a Virtual Disk with Parity

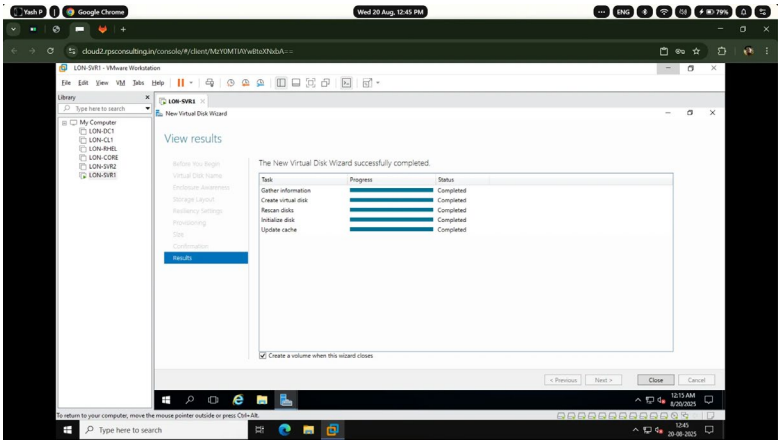
1. In StoragePool1 → Create new virtual disk → Name: **ParityDisk**.
2. Select **Parity** resiliency option.
3. Size: 10 GB.
4. Initialize disk and create volume → Assign drive letter **P:** → Label: **ParityVol**.

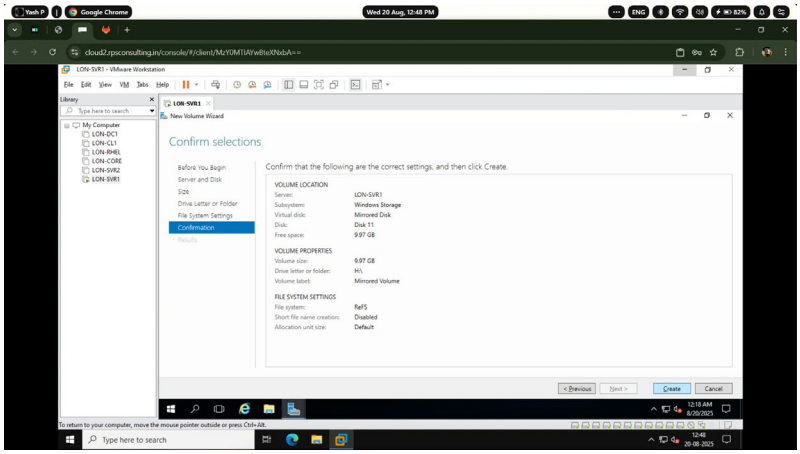
Task 3: Create a Virtual Disk with Mirror

1. In StoragePool1 → Create new virtual disk → Name: **MirrorDisk**.
2. Select **Two-way mirror** resiliency option.
3. Size: 5 GB.
4. Assign drive letter **M:** → Label: **MirrorVol**.


Wed 20 Aug, 12:41 PM
cloud2.rpsconsulting.in/console/#/client/MzY0MTIAYwBtoXNxbA==
LON-SVR1 - VMware Workstation
File and Storage Services ▸ Volumes ▸ Storage Pools
STORAGE POOLS
Select the storage pool
StoragePool1
OK
Cancel
Type here to search


Wed 20 Aug, 01:33 AM
cloud2.rpsconsulting.in/console/#/client/MzY0MTIAYwBtoXNxbA==
LON-SVR1 - VMware Workstation
New Virtual Disk Wizard
Select the storage layout
Before You Begin
Virtual Disk Name
Enclosure Awareness
Storage Layout
Provisioning
Size
Confirmation
Results
Layout:
Simple
Mirror
Parity
Description:
Data is striped across physical disks, creating two or three copies of your data. This increases reliability, but reduces capacity. To protect against a single disk failure, use at least two disks (three if you're using a cluster); to protect against two disk failures, use at least five disks.
< Previous
Next >
Create
Cancel
Type here to search


Wed 20 Aug, 12:45 PM
cloud2.rpsconsulting.in/console/#/client/MzY0MTIAYwBtoXNxbA==
LON-SVR1 - VMware Workstation
New Virtual Disk Wizard
View results
The New Virtual Disk Wizard successfully completed.
Task
Progress
Status
Gather information
Create virtual disk
Rescan disks
Initialize disk
Update cache
Completed
Results
Create a volume when this wizard closes
< Previous
Next >
Close
Cancel
Type here to search


Wed 20 Aug, 12:48 PM
cloud2.rpsconsulting.in/console/#/client/MzY0MTIAYwBtoXNxbA==
LON-SVR1 - VMware Workstation
New Volume Wizard
Confirm selections
Confirm that the following are the correct settings, and then click Create.
Before You Begin
Server and Disk
Size
Drive Letter or Folder
File System Settings
Confirmation
Results
VOLUME LOCATION
Server: LON-SVR1
Subsystem: Windows Storage
Virtual disk: Mirrored Disk
Disk: Disk 11
Free space: 9.97 GB
VOLUME PROPERTIES
Volume size: 9.97 GB
Drive letter or folder: H:\
Volume label: Mirrored Volume
FILE SYSTEM SETTINGS
File system: ReFS
Short file name creation: Disabled
Allocation unit size: Default
< Previous
Next >
Create
Cancel
Type here to search

Task 4: Create a Simple Virtual Disk

1. In StoragePool1 → Create new virtual disk → Name: **SimpleDisk**.
2. Select **Simple** resiliency option.
3. Size: 2 GB.
4. Assign drive letter **S:** → Label: **SimpleVol**.

Task 5: Verify with PowerShell

```
Get-StoragePool
Get-VirtualDisk
Get-PhysicalDisk
Get-Volume
```

Result: Successfully created storage pool and three types of virtual disks (Parity, Mirror, Simple).

Exercise 2: Implementing Data Deduplication

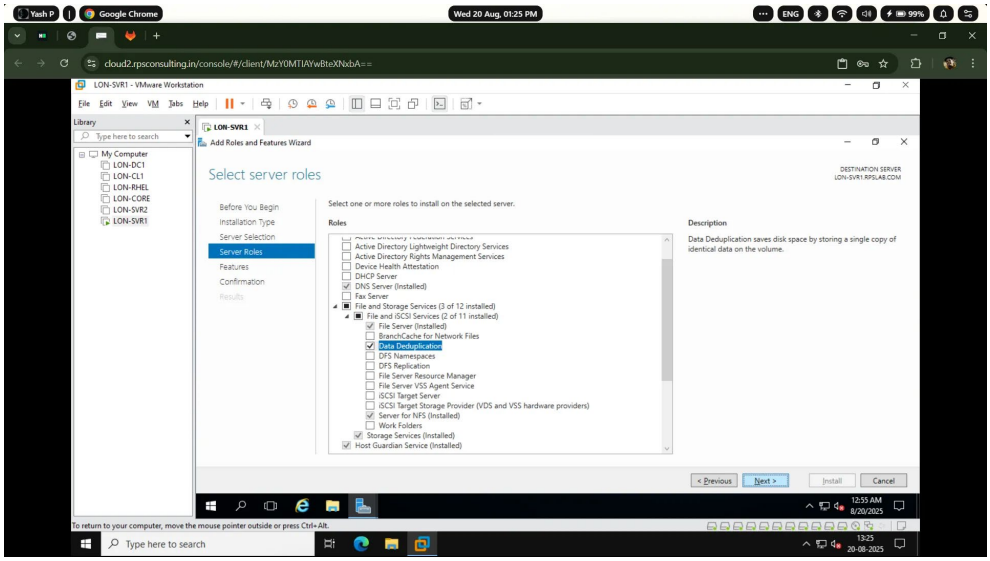
Task 1: Install Data Deduplication Role

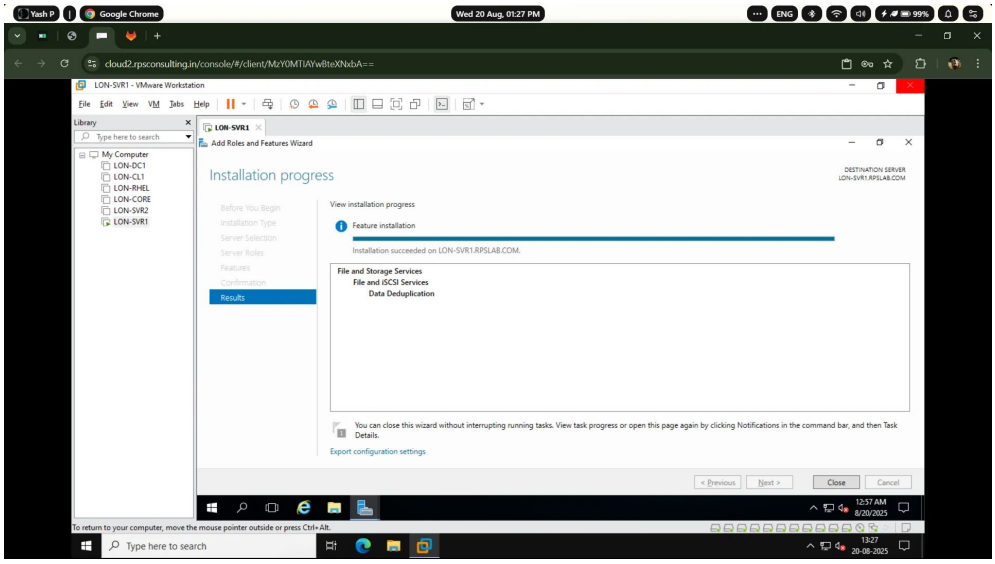
1. Open Server Manager → Add Roles and Features → Enable **Data Deduplication**.

Task 2: Enable Deduplication on Volume

On LON-SVR1:

```
Enable-DedupVolume -Volume "S:" -UsageType Default
```

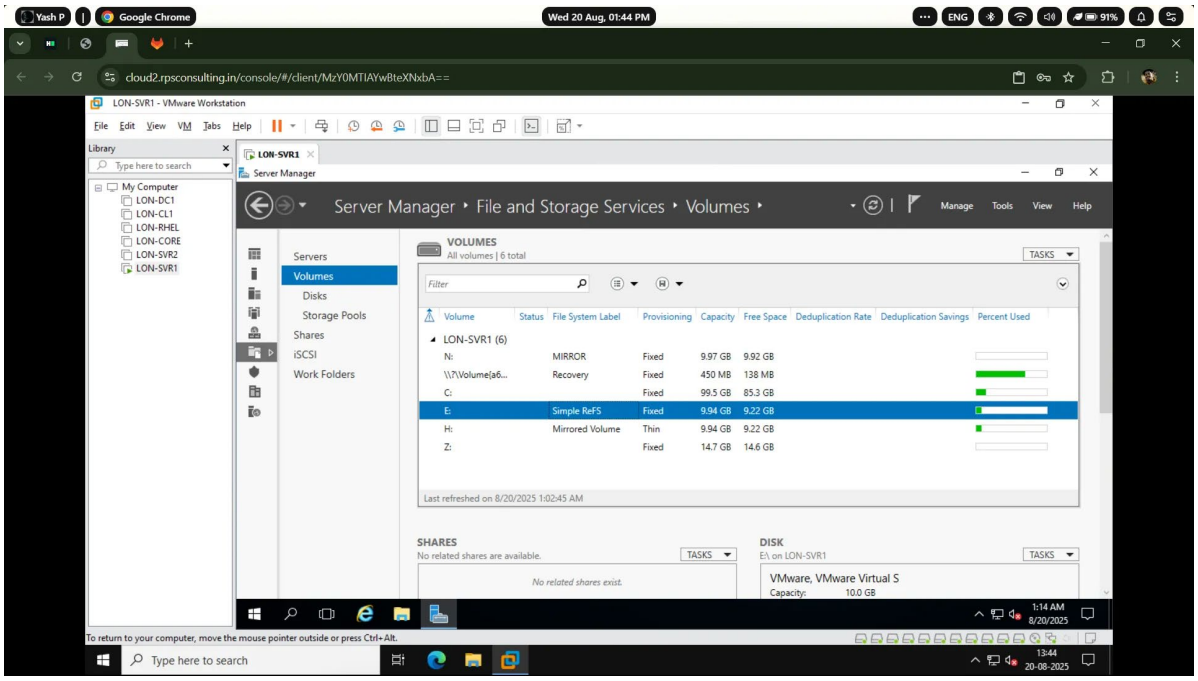


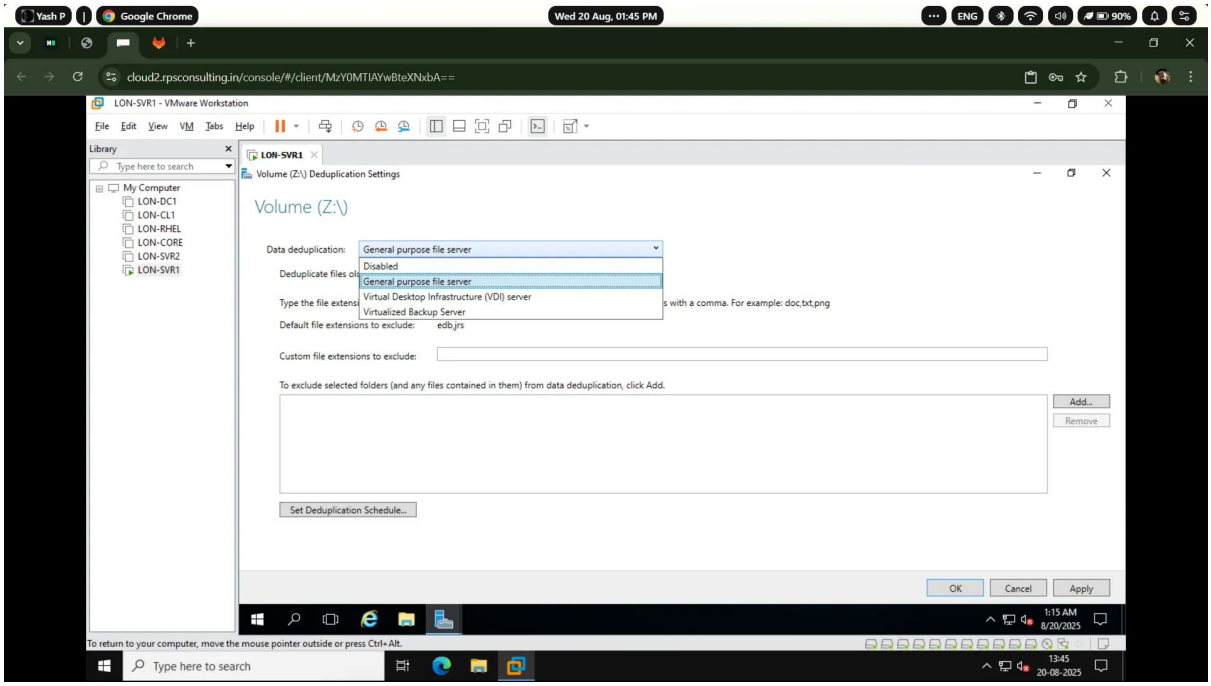


Task 3: Copy Sample Files for Deduplication

- Copy multiple identical files to **S:** drive.
- Run optimization:

```
Start-DedupJob -Volume "S:" -Type Optimization
```





Task 4: Check Deduplication Savings

```
Get-DedupStatus
Get-DedupVolume
```

Result: Deduplication successfully reduced duplicate file storage size.

Conclusion

By completing this lab, we:

- Configured a **Storage Pool** and created different types of virtual disks with resiliency options (parity, mirror, simple).
- Verified storage spaces using both GUI and PowerShell.
- Installed and enabled **Data Deduplication**, tested its functionality, and validated disk space savings.

Thus, Module 4 demonstrated how to optimize and manage enterprise storage using **Storage Spaces and Deduplication** in Windows Server 2016.