TOPIC: CONFIGURING LOCAL STORAGE

Objective:

- Understand and configure different types of local storage.
- Create and manage volumes, including mirrored and simple volumes.
- Perform resizing operations on volumes (extend/shrink).
- Manage virtual hard disks using Windows PowerShell.

Pre-requisites:

- Virtual Machines:
  - LON-DC1 (Windows Server 2016 Datacenter – GUI).
  - LON-SVR1 (Windows Server 2016 Datacenter – GUI).
- Access to **PowerShell (Admin)** and **Disk Management**.
- User credentials:
  - Username: Administrator
  - Password: Pa$$w0rd

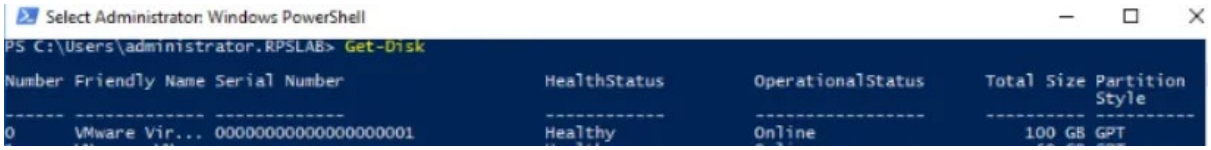
Procedure:

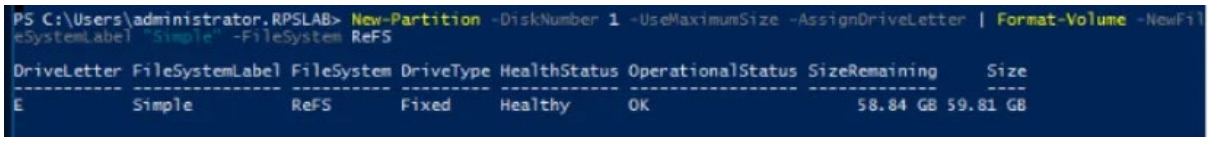
Exercise 1: Creating and Managing Volumes

Task 1: Create a Hard Disk Volume and Format for ReFS

1. Switch to LON-SVR1 → Open PowerShell (Admin).
2. List available raw disks:
3. Get-Disk | Where-Object PartitionStyle –Eq "RAW"
4. Initialize disk 2:
5. Initialize-Disk 2
6. Verify partition table:
7. Get-Disk
8. Create ReFS volume:

9. New-Partition -DiskNumber 2 -UseMaximumSize -AssignDriveLetter | Format-Volume -NewFileSystemLabel "Simple" -FileSystem ReFS
10. Verify drive letter assigned (e.g., F:).



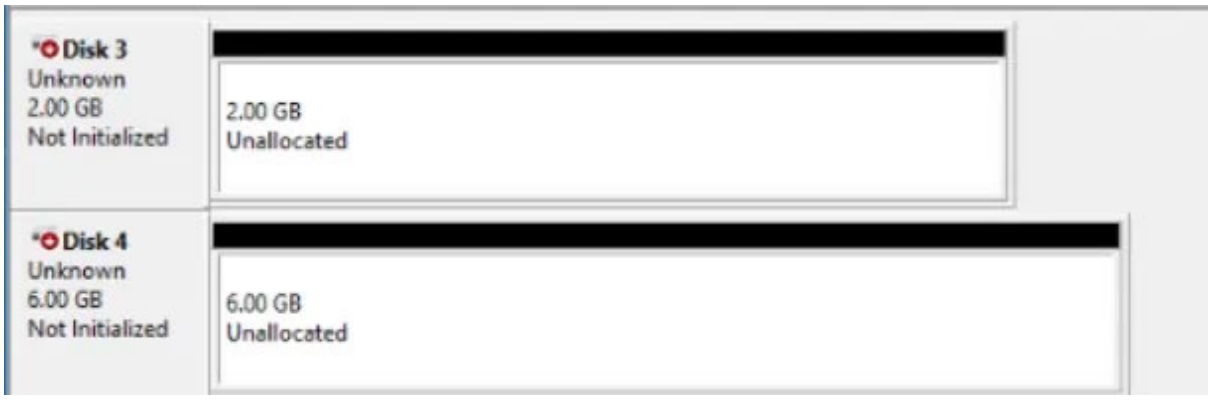


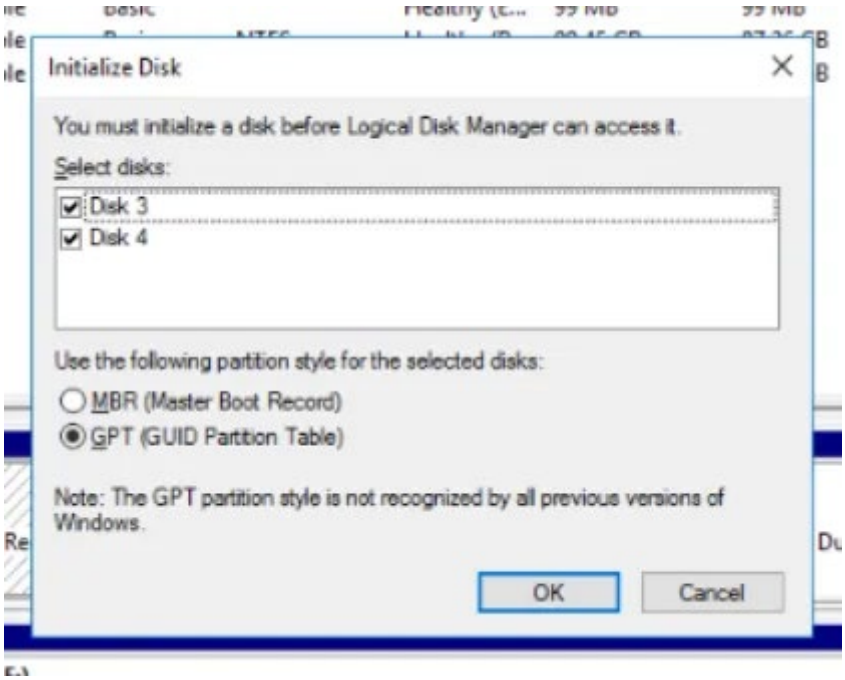
Task 2: Create a Mirrored Volume

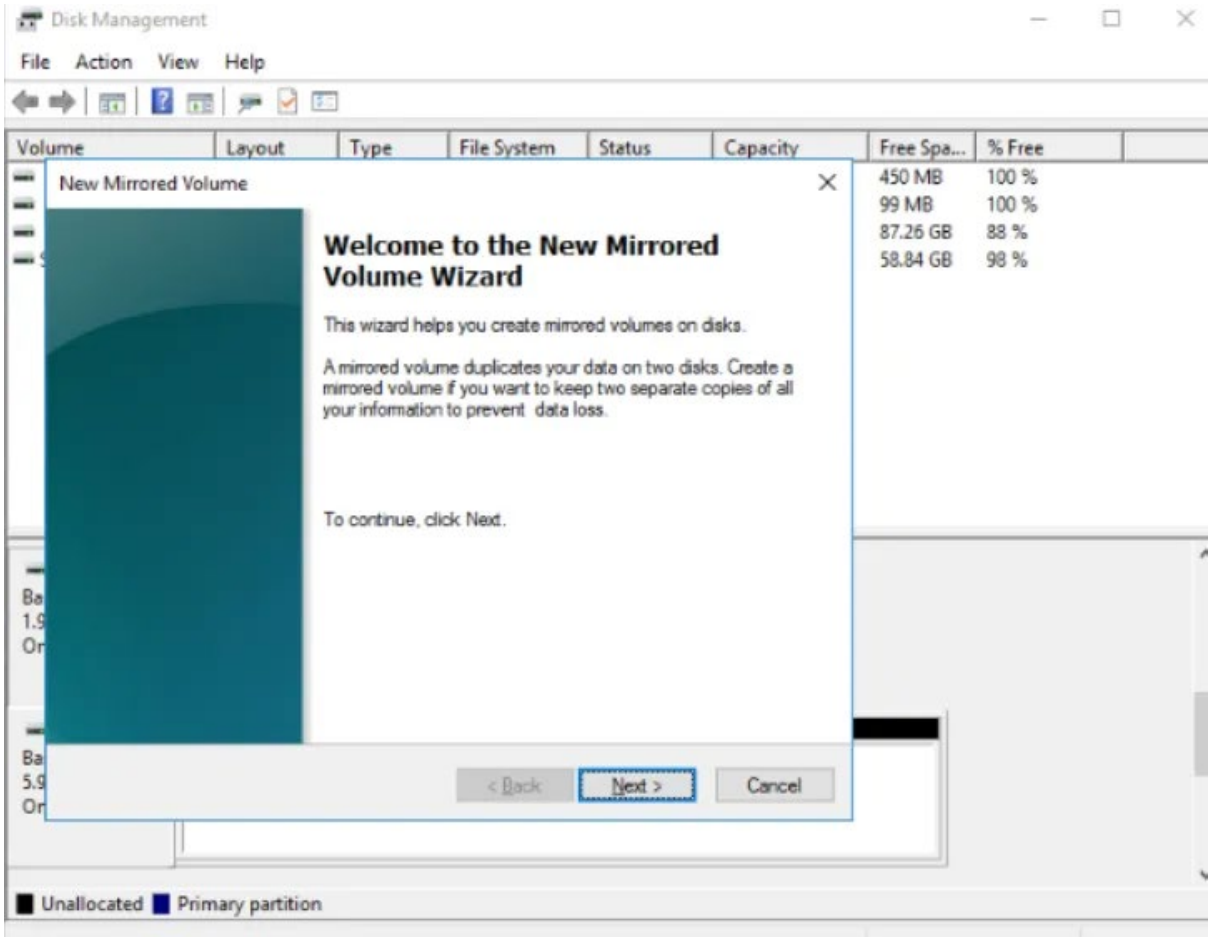
1. Open Disk Management.
2. Bring Disk 3 and Disk 4 online.
3. Initialize both disks.
4. On Disk 3 → Right-click *Unallocated* → Select **New Mirrored Volume**.
5. Add Disk 4, accept default size, and assign drive letter M.
6. Label volume as **MIRROR** → Perform quick format.
7. Accept conversion to dynamic disks.

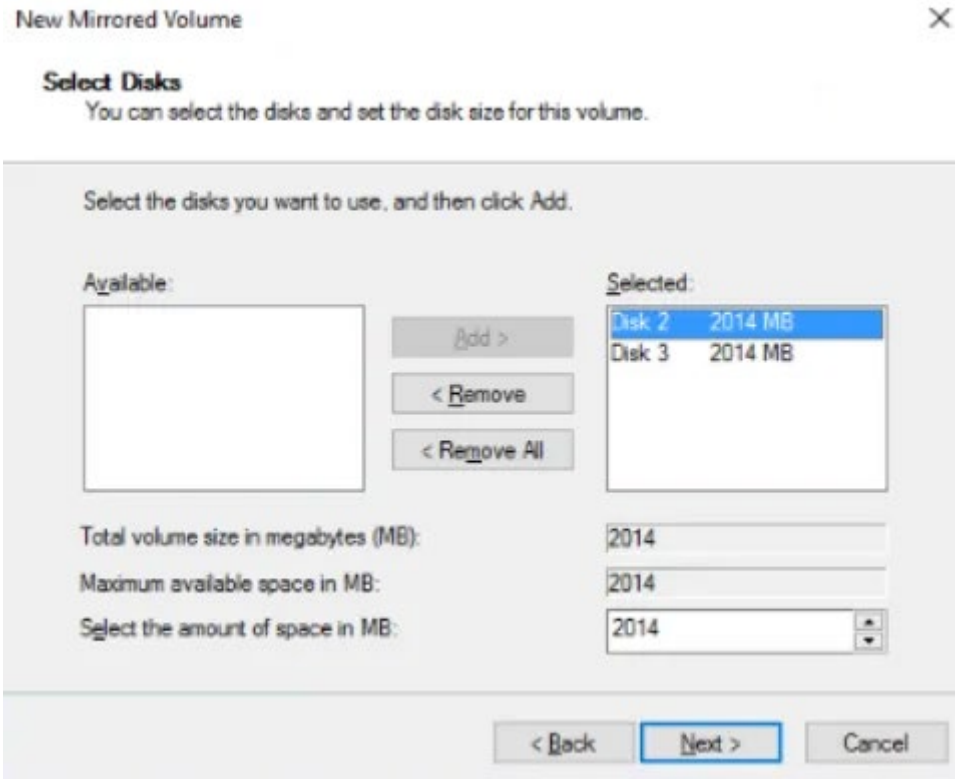
Result: Multiple volumes successfully created.

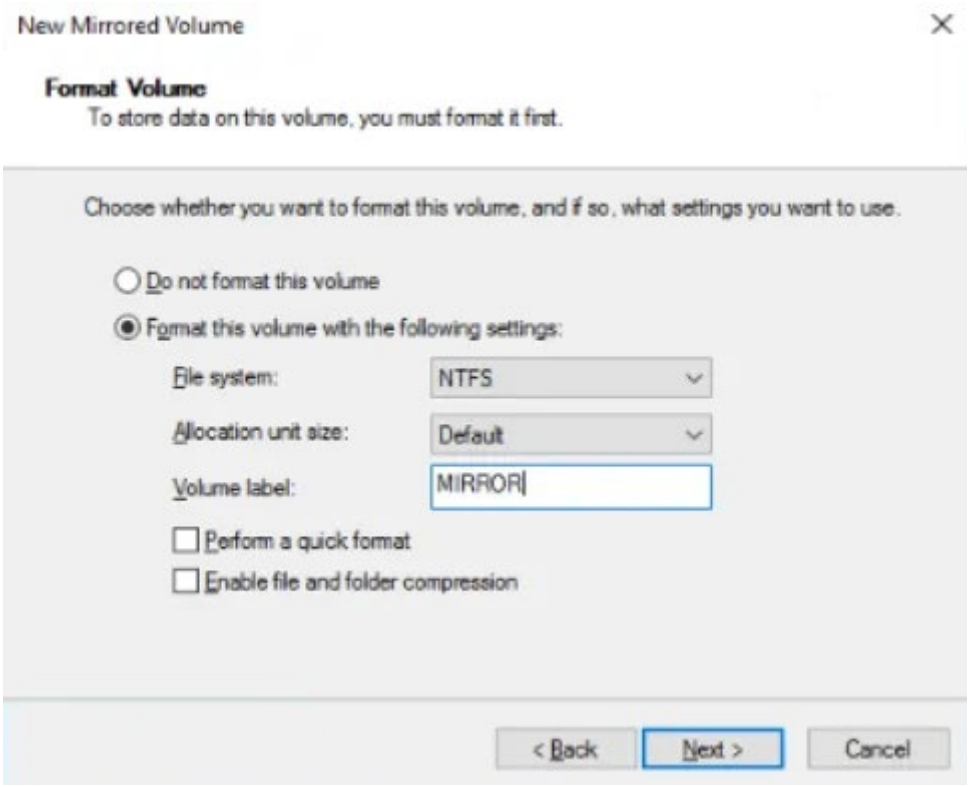

*Disk 3
Unknown
2.00 GB
Offline
2.00 GB
Unallocated
*Disk 4
Unknown
6.00 GB
Offline
6.00 GB
Unallocated

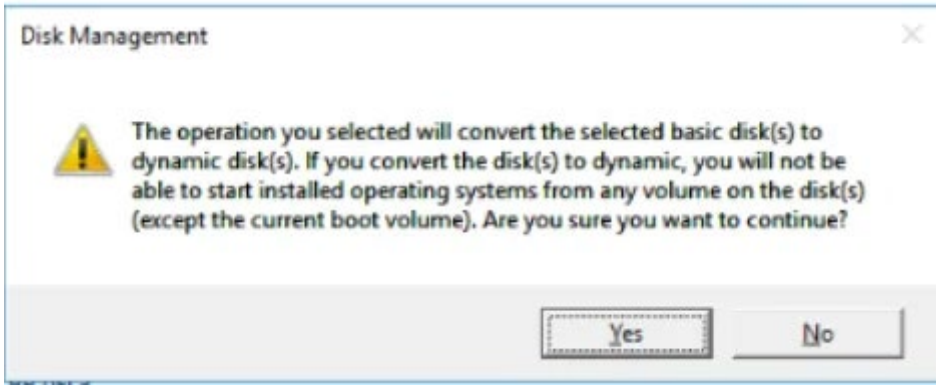

*Disk 3
Unknown
2.00 GB
Not Initialized
2.00 GB
Unallocated
*Disk 4
Unknown
6.00 GB
Not Initialized
6.00 GB
Unallocated

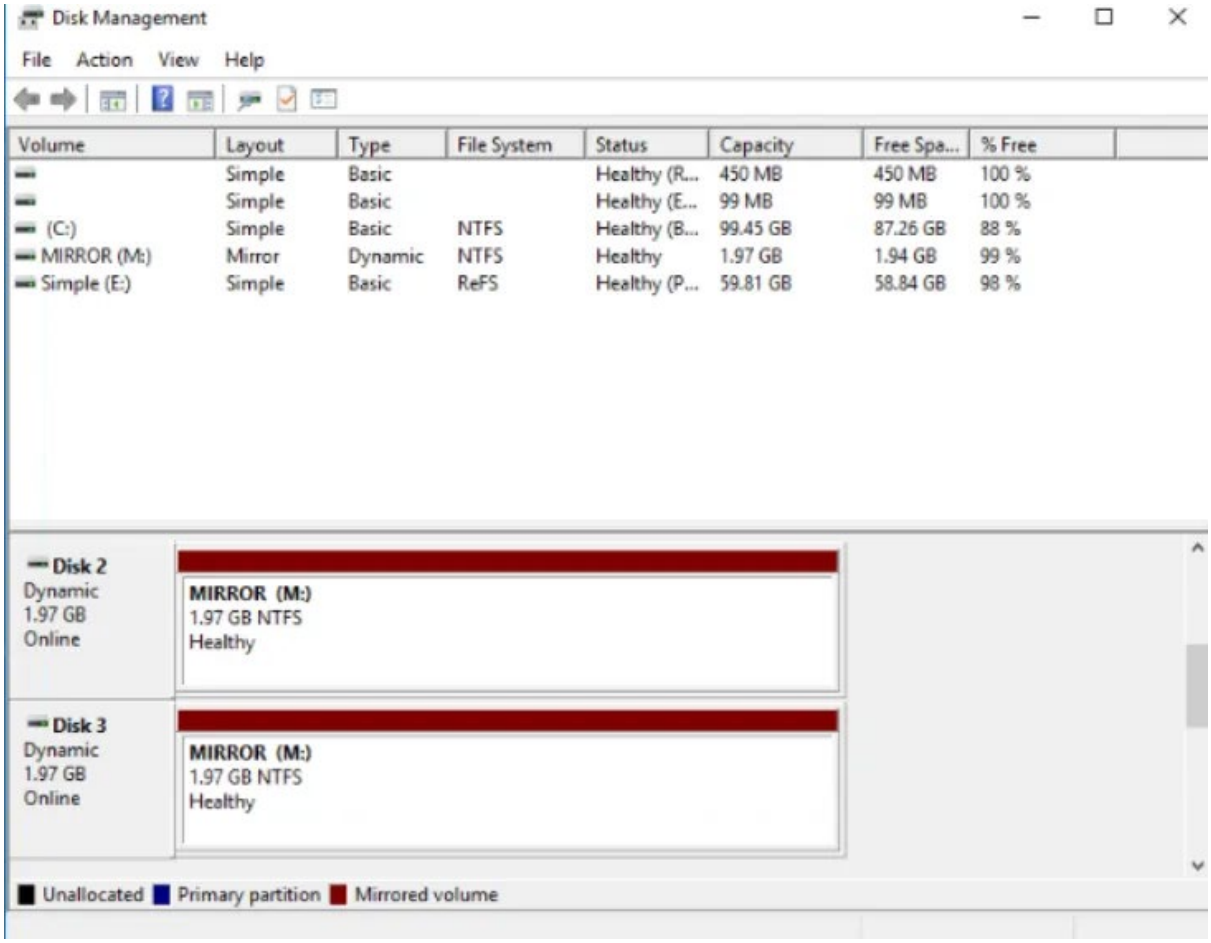

Initialize Disk
You must initialize a disk before Logical Disk Manager can access it.
Select disks:
Disk 3
Disk 4
Use the following partition style for the selected disks:
MBR (Master Boot Record)
GPT (GUID Partition Table)
Note: The GPT partition style is not recognized by all previous versions of Windows.
OK
Cancel


Disk Management
File Action View Help
Volume Layout Type File System Status Capacity Free Spa... % Free
450 MB 100 %
99 MB 100 %
87.26 GB 88 %
58.84 GB 98 %
New Mirrored Volume
Welcome to the New Mirrored Volume Wizard
This wizard helps you create mirrored volumes on disks.
A mirrored volume duplicates your data on two disks. Create a mirrored volume if you want to keep two separate copies of all your information to prevent data loss.
To continue, click Next.
< Back
Next >
Cancel
Unallocated
Primary partition


New Mirrored Volume
Select Disks
You can select the disks and set the disk size for this volume.
Select the disks you want to use, and then click Add.
Available:
Selected:
Disk 2 2014 MB
Disk 3 2014 MB
Add >
< Remove
< Remove All
Total volume size in megabytes (MB):
2014
Maximum available space in MB:
2014
Select the amount of space in MB:
2014
< Back
Next >
Cancel


New Mirrored Volume
Format Volume
To store data on this volume, you must format it first.
Choose whether you want to format this volume, and if so, what settings you want to use.
Do not format this volume
Format this volume with the following settings:
File system:
NTFS
Allocation unit size:
Default
Volume label:
MIRROR
Perform a quick format
Enable file and folder compression
< Back
Next >
Cancel


Disk Management
The operation you selected will convert the selected basic disk(s) to dynamic disk(s). If you convert the disk(s) to dynamic, you will not be able to start installed operating systems from any volume on the disk(s) (except the current boot volume). Are you sure you want to continue?
Yes
No



Exercise 2: Resizing Volumes

Task 1: Create a Simple Volume and Resize It

1. Initialize Disk 5:

```
Initialize-Disk 5
```

2. Launch **Diskpart** and run:

```
List disk
Select disk 5
Convert dynamic
Create volume simple size=10000 disk=5
Assign letter=Z
Format
```

3. Verify 10 GB NTFS volume in Disk Management.

4. Extend volume:

```
Extend size=10000
```

5. Verify extended size ~20 GB.

```
PS C:\Users\administrator.RPSLAB> Diskpart

Microsoft DiskPart version 10.0.14393.0

Copyright (C) 1999-2013 Microsoft Corporation.
On computer: LON-SVR1

DISKPART> List Disk

  Disk ###  Status         Size     Free     Dyn  Gpt
  --------  -------------  -------  -------  ---  ---
  Disk 0    Online          100 GB      0 B        *
  Disk 1    Online           60 GB      0 B        *
  Disk 2    Online         2048 MB  1920 KB   *    *
  Disk 3    Online         2048 MB  1920 KB   *    *
  Disk 4    Online         6144 MB  6110 MB        *

DISKPART> select disk 4

Disk 4 is now the selected disk.

DISKPART> convert dynamic

DiskPart successfully converted the selected disk to dynamic format.

DISKPART> create volume simple size=6110 disk=4

DiskPart successfully created the volume.

DISKPART> Assign letter Z

DiskPart successfully assigned the drive letter or mount point.
```

Task 2: Shrink a Volume

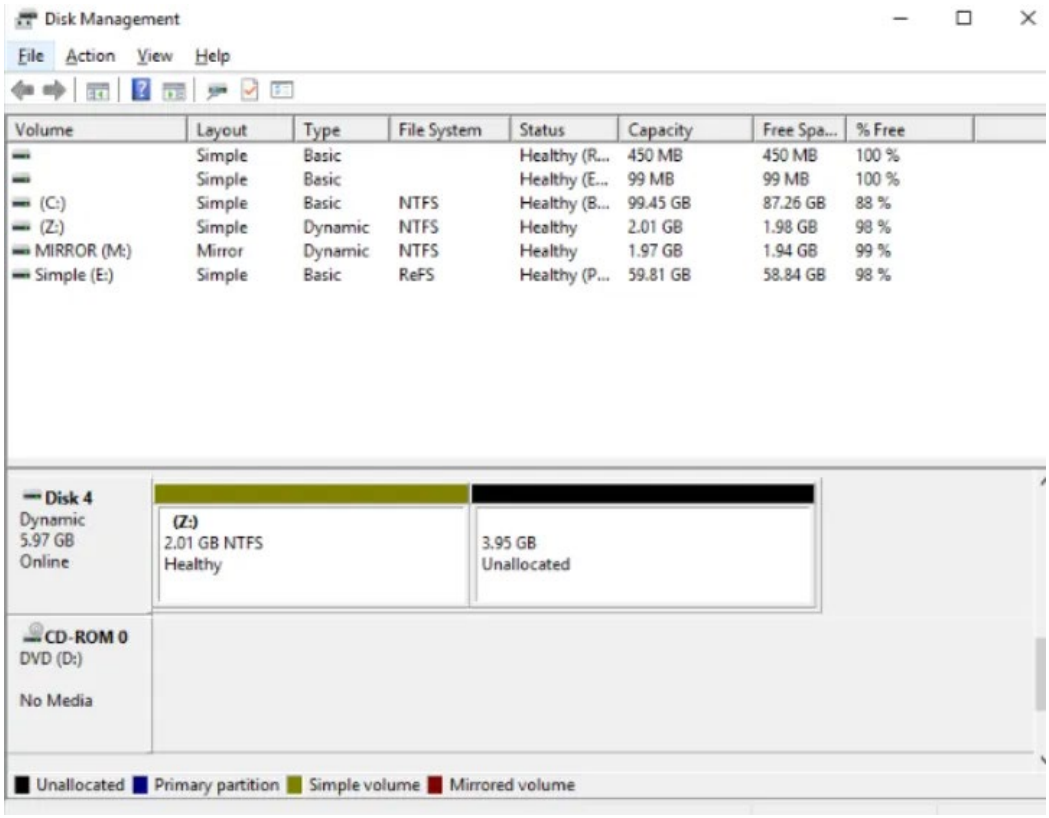
1. Run:

```
Shrink desired=15000
```

2. Verify reduced size (~5 GB).

Result: Successfully created, extended, and shrunk a volume.

```
PS C:\Users\administrator.RPSLAB> diskpart

Microsoft DiskPart version 10.0.14393.0

Copyright (C) 1999-2013 Microsoft Corporation.
On computer: LON-SVR1

DISKPART> list disk

  Disk ###  Status         Size     Free     Dyn  Gpt
  --------  -------------  -------  -------  ---  ---
  Disk 0    Online          100 GB      0 B        *
  Disk 1    Online           60 GB      0 B        *
  Disk 2    Online         2048 MB  1920 KB   *    *
  Disk 3    Online         2048 MB  1920 KB   *    *
  Disk 4    Online         6144 MB      0 B   *    *

DISKPART> list volume

  Volume ###  Ltr  Label        Fs     Type        Size     Status     Info
  ----------  ---  -----------  -----  ----------  -------  ---------  --------
  Volume 0     Z                NTFS   Simple      6110 MB  Healthy
  Volume 1     M   MIRROR       NTFS   Mirror      2014 MB  Healthy
  Volume 2     D                       DVD-ROM        0 B  No Media
  Volume 3     C                NTFS   Partition     99 GB  Healthy    Boot
  Volume 4         Recovery     NTFS   Partition    450 MB  Healthy    Hidden
  Volume 5                      FAT32  Partition     99 MB  Healthy    System
  Volume 6     E   Simple       ReFS   Partition     59 GB  Healthy

DISKPART> select volume 0

Volume 0 is the selected volume.

DISKPART> shrink desired-4048

The arguments specified for this command are not valid.
For more information on the command type: HELP SHRINK

DISKPART> shrink desired=4048

DiskPart successfully shrunk the volume by: 4048 MB
```



Exercise 3: Managing Virtual Hard Disks

Task 1: Install Windows PowerShell Hyper-V Module

1. On host computer → Open **Server Manager** → Add roles and features.
2. Select **Hyper-V** role → Add features → Install.
3. Restart system if required.

Task 2: Create a Virtual Hard Disk

Run in PowerShell:

```
New-VHD -Path c:\sales.vhd -Dynamic -SizeBytes 10Gb | Mount-VHD -Passthru |
```

```
Initialize-Disk -Passthru | New-Partition -AssignDriveLetter -UseMaximumSize |
```

```
Format-Volume -FileSystem NTFS -Confirm:$false -Force
```

Task 3: Reconfigure the Virtual Hard Disk

1. Dismount VHD:

```
Dismount-VHD C:\Sales.vhd
```

2. Check properties:

```
Get-VHD C:\Sales.vhd
```

3. Convert to VHDX:

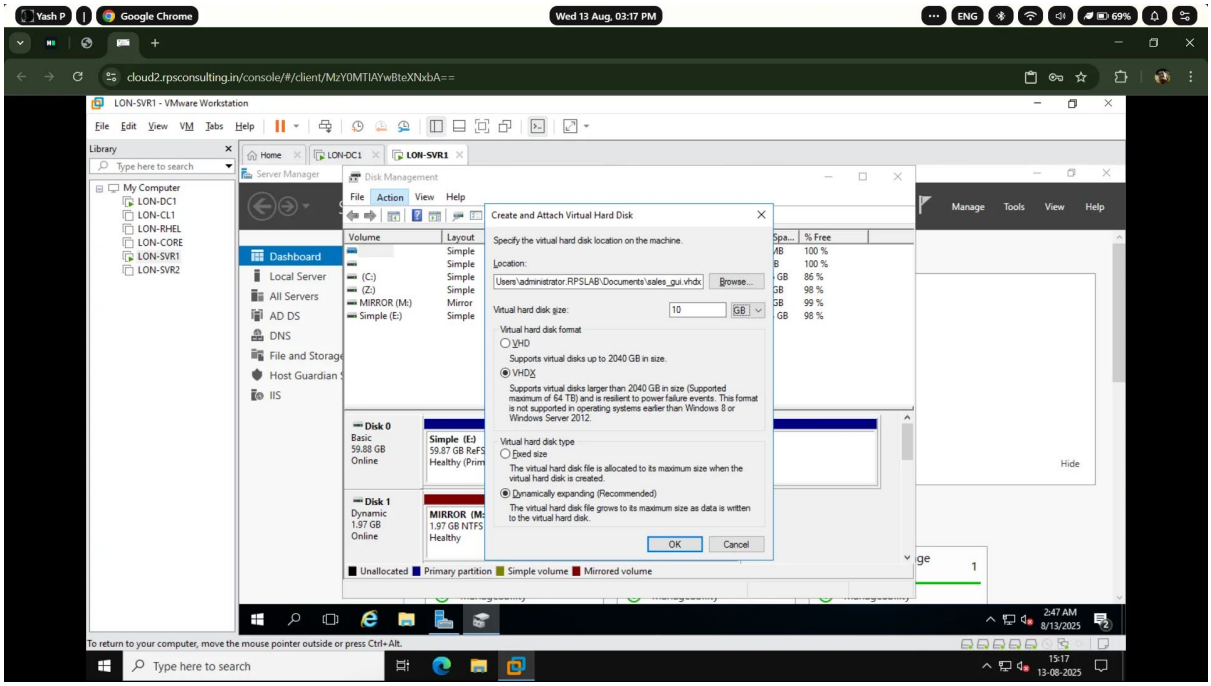
```
Convert-VHD –Path C:\Sales.vhd –DestinationPath c:\Sales.vhdx
```

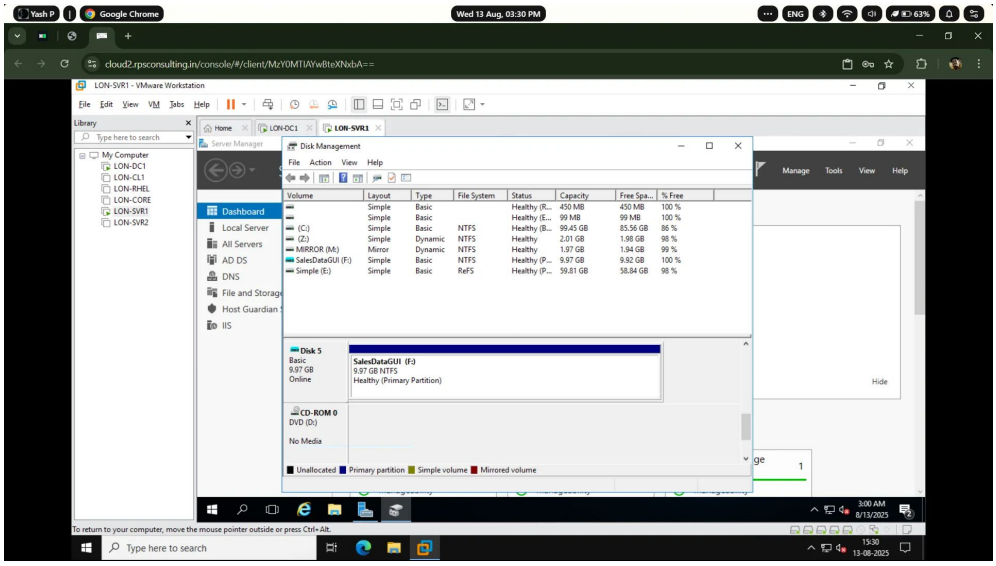
4. Change sector size:

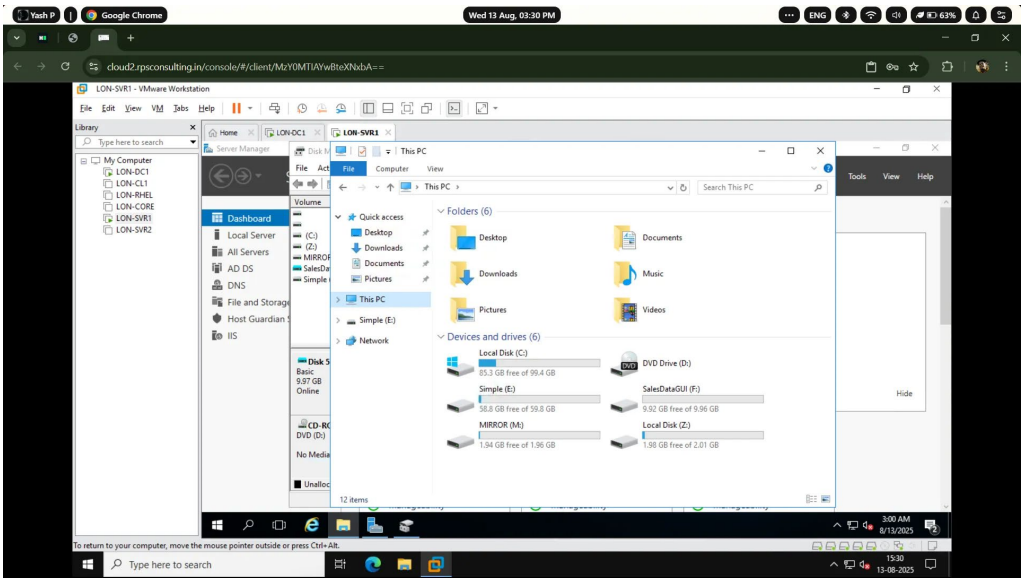
```
Set-VHD –Path c:\Sales.vhdx –PhysicalSectorSizeBytes 4096
```

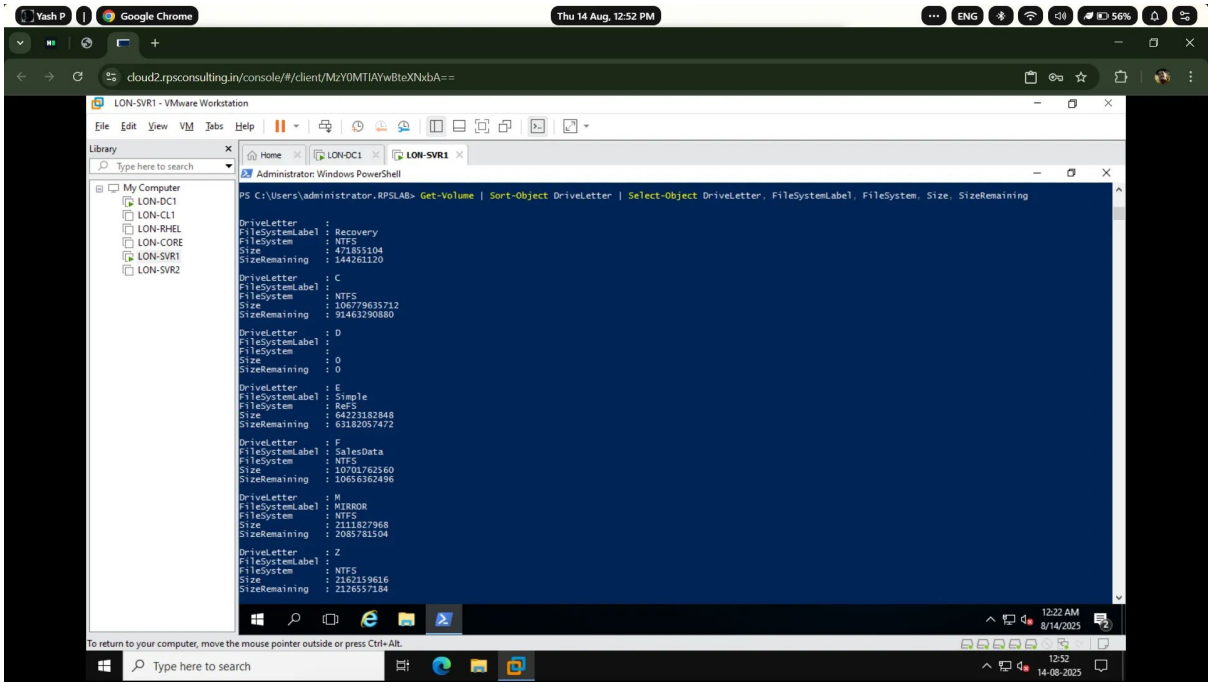
5. Optimize VHDX:

```
Optimize-VHD –Path c:\Sales.vhdx –Mode Full
```


Yash P
Google Chrome
Wed 13 Aug, 03:17 PM
ENG
69%
cloud2.rpsconsulting.in/console/#/client/MzY0MTIAYwBteXNxbA==
LON-SVR1 - VMware Workstation
File Edit View VM Tabs Help
Library
Type here to search
My Computer
LON-DC1
LON-CL1
LON-RHEL
LON-CORE
LON-SVR1
LON-SVR2
Home
LON-DC1
LON-SVR1
Server Manager
Disk Management
File Action View Help
Create and Attach Virtual Hard Disk
Specify the virtual hard disk location on the machine.
Location:
Users\administrator.RPSLAB\Documents\sales_gui.vhdx
Browse...
Virtual hard disk size:
10
GB
Virtual hard disk format
VHD
Supports virtual disks up to 2040 GB in size.
VHDX
Supports virtual disks larger than 2040 GB in size (Supported maximum of 64 TB) and is resilient to power failure events. This format is not supported in operating systems earlier than Windows 8 or Windows Server 2012.
Virtual hard disk type
Fixed size
The virtual hard disk file is allocated to its maximum size when the virtual hard disk is created.
Dynamically expanding (Recommended)
The virtual hard disk file grows to its maximum size as data is written to the virtual hard disk.
OK
Cancel
Volume
Layout
Dashboard
Local Server
All Servers
AD DS
DNS
File and Storage
Host Guardian
IIS
Disk 0
Basic
59.88 GB
Online
Simple (E:)
Disk 1
Dynamic
1.97 GB
Online
MIRROR (M:)
1.97 GB NTFS
Healthy
Unallocated
Primary partition
Simple volume
Mirrored volume
Manage
Tools
View
Help
Hide
To return to your computer, move the mouse pointer outside or press Ctrl+Alt.
Type here to search
2:47 AM
8/13/2025
15:17
13-08-2025


Yash P
Google Chrome
Wed 13 Aug, 03:30 PM
ENG
63%
cloud2.rpsconsulting.in/console/#/client/MzY0MTIAYwBteXNxbA==
LON-SVR1 - VMware Workstation
Disk Management
File Action View Help
Volume
Layout
Type
File System
Status
Capacity
Free Spa...
% Free
Disk 5
Basic
9.97 GB
Online
SalesDataGUI (F:)
9.97 GB NTFS
Healthy (Primary Partition)
CD-ROM 0
DVD (D:)
No Media
Unallocated
Primary partition
Simple volume
Mirrored volume
Hide
To return to your computer, move the mouse pointer outside or press Ctrl+Alt.
Type here to search
3:00 AM
8/13/2025
15:30
13-08-2025


Yash P
Google Chrome
Wed 13 Aug, 03:30 PM
ENG
63%
cloud2.rpsconsulting.in/console/#/client/MzY0MTIAYwBteXNxbA==
LON-SVR1 - VMware Workstation
This PC
Quick access
Desktop
Downloads
Documents
Pictures
This PC
Simple (E:)
Network
Folders (6)
Desktop
Documents
Downloads
Music
Pictures
Videos
Devices and drives (6)
Local Disk (C:)
85.3 GB free of 99.4 GB
DVD Drive (D:)
Simple (E:)
58.8 GB free of 59.8 GB
SalesDataGUI (F:)
9.92 GB free of 9.96 GB
MIRROR (M:)
1.94 GB free of 1.96 GB
Local Disk (Z:)
1.98 GB free of 2.01 GB
12 items
Hide
To return to your computer, move the mouse pointer outside or press Ctrl+Alt.
Type here to search
3:00 AM
8/13/2025
15:30
13-08-2025



Result: Successfully created, converted, and optimized virtual hard disks.

Conclusion

By completing this lab, we:

- Created and managed local volumes (simple and mirrored).
- Performed **resizing operations** (extend and shrink).
- Installed and used the **Hyper-V PowerShell module** to manage virtual hard disks.
- Converted and optimized VHD files.

Thus, Module 2 demonstrated essential tasks for **configuring and managing local storage in Windows Server 2016**.