AZURE LAB 7 (DATA DISK SNAPSHOT)

A data disk snapshot is a point-in-time copy of a data disk in a computing environment. This snapshot captures the exact state of the disk at the moment it is taken, including all the data and configurations stored on the disk. Snapshots are commonly used in various computing and storage systems to provide data protection, backup, and recovery capabilities.

Here are some key points about data disk snapshots:

1. **Point-in-Time Copy:** A snapshot is a read-only copy of a disk's data at a specific point in time. It does not represent real-time data but rather a frozen image of the disk contents at the moment the snapshot was created.
2. **Data Protection and Backup:** Snapshots are often used as a means of data protection and backup. They provide a quick and efficient way to capture the state of a disk, allowing users to revert to that state if data becomes corrupted, deleted, or otherwise compromised.
3. **Incremental Changes:** To optimize storage space and performance, some snapshot systems only capture the changes made to the disk since the last snapshot. This is known as incremental snapshotting and helps reduce the amount of data that needs to be stored for each snapshot.
4. **Quick Recovery:** In the event of data loss or corruption, a snapshot allows for quick recovery by restoring the disk to a previous state. This can be valuable for minimizing downtime and data loss.
5. **Testing and Development:** Snapshots are also used in testing and development environments. Developers can create a snapshot before making significant changes, allowing them to experiment without affecting the original data. If something goes wrong, they can revert to the snapshot.
6. **Cloud and Virtualization Platforms:** Many cloud providers and virtualization platforms offer snapshot functionality for their storage services. Users can create and manage snapshots through the platform's interface or API.

😁 USE CASES OF DATA DISK SNAPSHOT

Data disk snapshots are used in various scenarios to address specific needs related to data protection, recovery, and operational efficiency. Here are some common use cases for data disk snapshots:

1. **Backup and Recovery:**
   Use Case: Regularly capturing snapshots of data disks to create backup points.
   Scenario: In the event of data corruption, accidental deletion, or system failure, administrators can quickly restore the disk to a previous state using the snapshot.
2. **Data Consistency for Databases:**
   Use Case: Ensuring data consistency in database systems.

Scenario: Before performing updates, patches, or maintenance on a database, administrators can take a snapshot. If the operation leads to issues, they can revert to the snapshot to maintain a consistent state.

3. **Software Development and Testing:**
   Use Case: Supporting software development and testing processes.
   Scenario: Developers can create snapshots before making significant changes or testing new features. If the changes negatively impact the system, they can revert to the snapshot to quickly return to a stable state.
4. **Rollback for Configuration Changes:**
   Use Case: Rolling back configuration changes.
   Scenario: Before making changes to system configurations or applying updates, administrators can take a snapshot. If the changes cause issues, they can revert to the snapshot, undoing the modifications.
5. **Disaster Recovery:**
   Use Case: Enhancing disaster recovery capabilities.
   Scenario: In the event of a catastrophic failure or data center outage, organizations can use snapshots to restore data and services quickly. This complements other disaster recovery strategies.
6. **Data Migration and Cloning:**
   Use Case: Facilitating data migration and cloning processes.
   Scenario: Before migrating data to a new system or creating clones for testing or deployment, administrators can take a snapshot. This ensures that the data is captured accurately at a specific point in time.
7. **Minimizing Downtime:**
   Use Case: Reducing downtime during maintenance or upgrades.
   Scenario: Snapshots can be used to create a backup of the system state before performing maintenance tasks. If an issue arises during the process, the system can be quickly restored to the snapshot, minimizing downtime.
8. **File-Level Recovery:**
   Use Case: Enabling file-level recovery.
   Scenario: Users or administrators can use snapshots to recover specific files or folders without restoring the entire disk. This provides granular control over the recovery process.
9. **Security and Ransomware Protection:**
   Use Case: Protecting against ransomware and security threats.
   Scenario: Regularly creating snapshots can serve as a defense mechanism against ransomware. If data is encrypted or compromised, organizations can revert to a snapshot taken before the attack occurred.
10. **Capacity Planning:**
    Use Case: Supporting capacity planning and resource management.
    Scenario: Before making changes to disk sizes or adjusting resource allocations, administrators can use snapshots to create a backup point. This ensures that they can easily revert if changes lead to unforeseen issues.

😥 DRAWBAKS OF DATA DISK SNAPSHOT

While data disk snapshots offer valuable benefits, they also come with certain drawbacks and considerations. It's important to be aware of these limitations to use snapshots effectively and to complement them with other data protection measures. Here are some drawbacks of data disk snapshots:

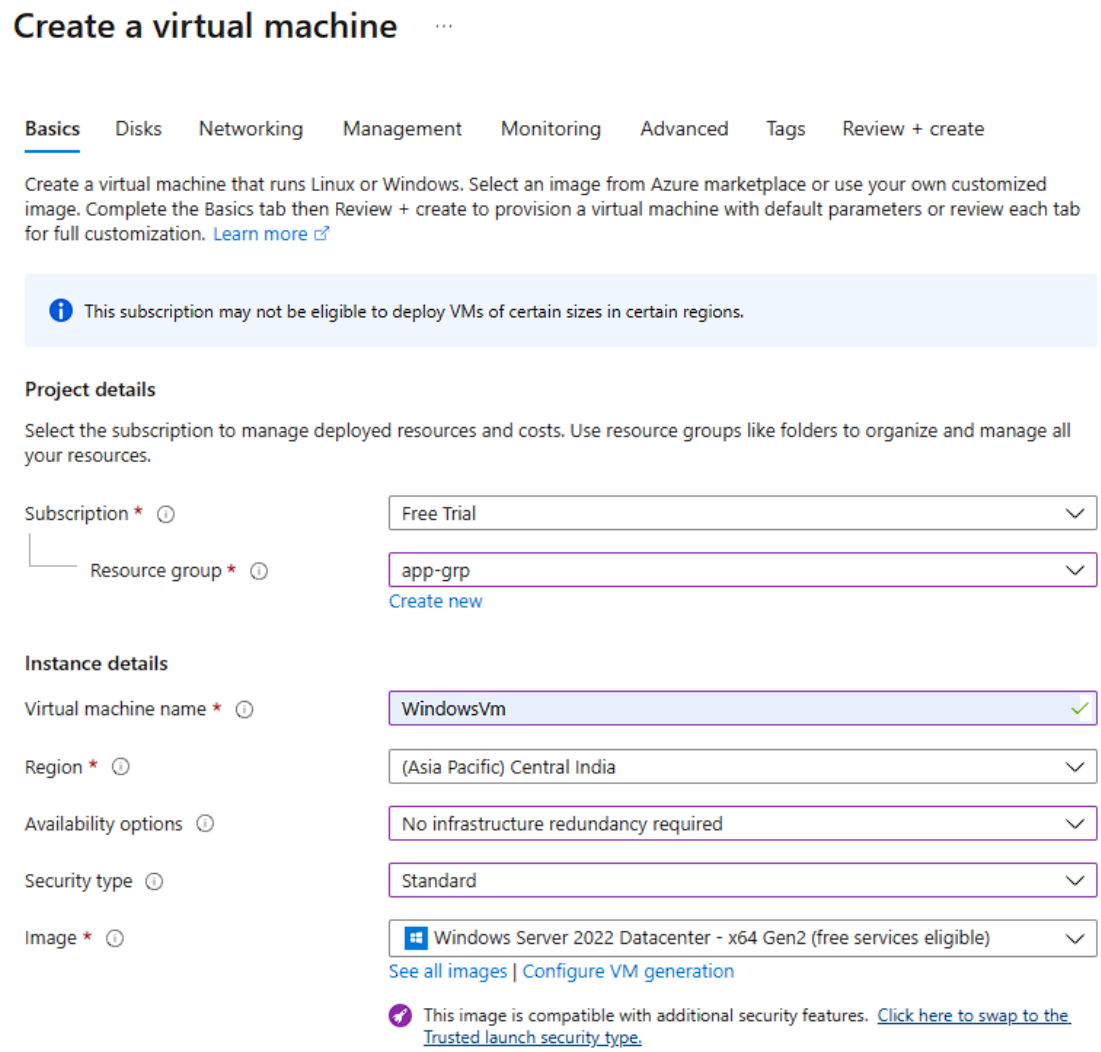
1. **Limited Retention Period:** Snapshots often have a limited retention period due to storage constraints. Older snapshots may be automatically deleted, potentially leading to data loss if a snapshot from a needed point in time is no longer available.
2. **Performance Impact:** Creating and managing snapshots can introduce some level of performance overhead on the storage system. This impact can be more noticeable in environments with frequent snapshot creation or on systems with heavy I/O workloads.
3. **Storage Costs:** Snapshots consume storage space, and the storage cost can accumulate, especially in scenarios where frequent snapshots or long retention periods are required. Organizations need to manage storage costs effectively.
4. **Complexity of Management:** As the number of snapshots increases, managing and tracking them can become complex. This complexity may lead to challenges in identifying and selecting the appropriate snapshot for recovery.
5. **Dependency on the Underlying Storage System:** The effectiveness and features of snapshots depend on the capabilities of the underlying storage system. Not all storage systems or cloud providers offer the same snapshot functionality, which may limit interoperability.
6. **Consistency Challenges for Application Data:** Snapshots may not guarantee application-level consistency, especially in databases or applications with complex dependencies. Restoring from a snapshot might lead to inconsistencies in the application state.
7. **Not a Substitute for Backups:** While snapshots provide a level of data protection, they are not a substitute for traditional backups. Snapshots are typically stored on the same infrastructure and may not be sufficient in scenarios involving catastrophic failures, disasters, or malicious attacks.
8. **Resource Intensive during Snapshot Creation:** The process of creating snapshots, especially in large-scale environments, can be resource-intensive. This may impact the performance of the system during the snapshot creation period.
9. **Potential for Data Corruption:** In certain situations, such as abrupt system interruptions during snapshot creation, there is a risk of data corruption. Snapshots are not immune to hardware failures or other issues that might affect the integrity of the captured data.
10. **Complexity in Hybrid and Multi-Cloud Environments:** Managing snapshots becomes more complex in hybrid and multi-cloud environments where data is distributed across different platforms. Ensuring consistency and interoperability can be challenging.
11. **Impact on Network Bandwidth:** In cloud environments, transferring large snapshots between regions or availability zones can impact network bandwidth. This

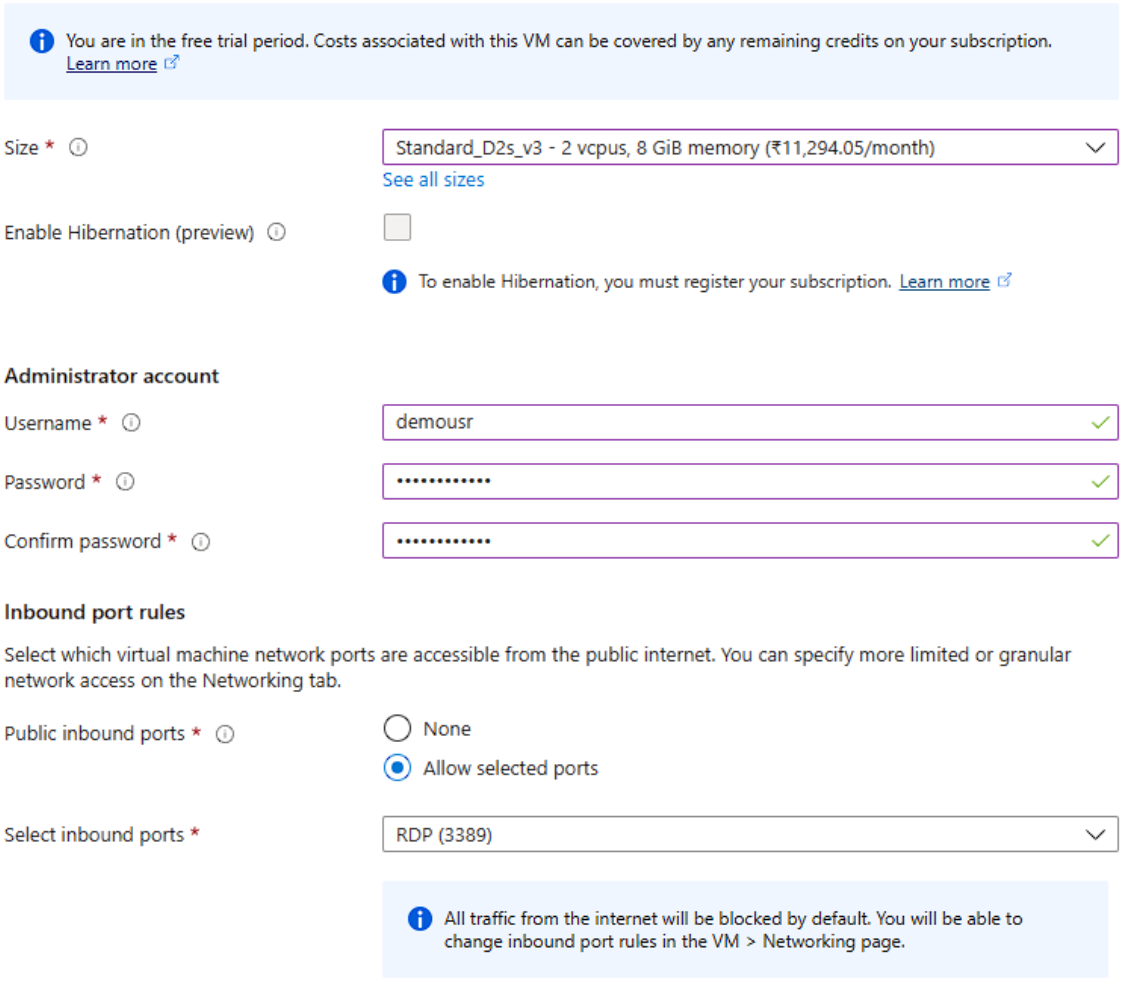
consideration is important for organizations with bandwidth limitations or cost-sensitive networking setups.

😊 HOW TO CREATE A DATA DISK SNAPSHOT IN WINDOWS VIRTUAL MACHINE?

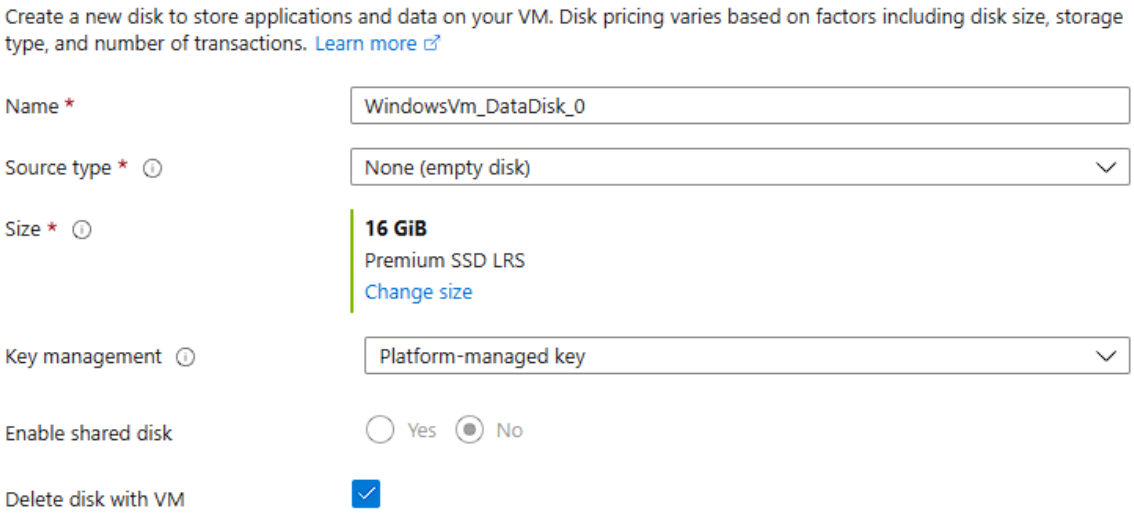
STEP 1: CREATE A VIRTUAL MACHINE WITH A NEW DISK ATTACHED TO IT.

1. Log in Azure Portal. Click on create a resource, and create a windows virtual machine.

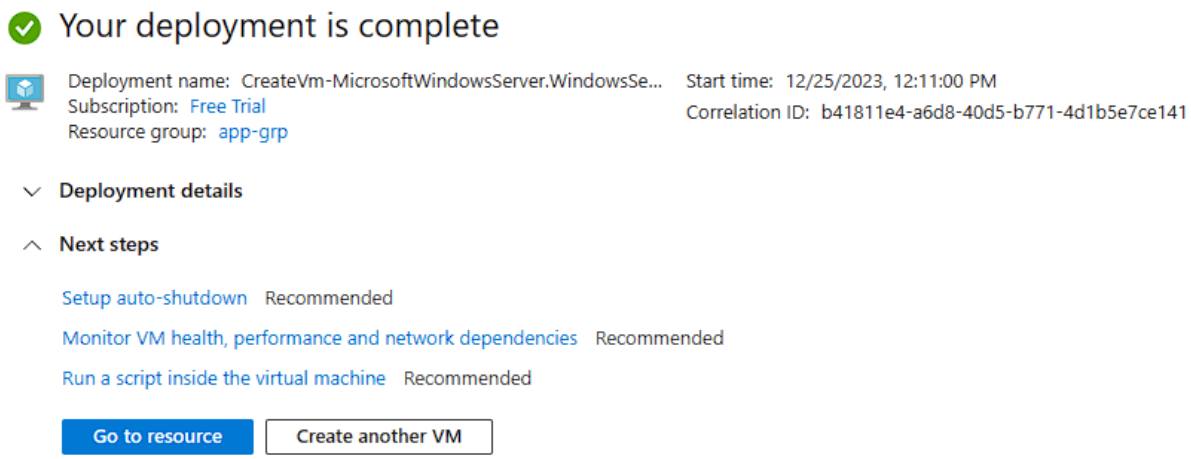




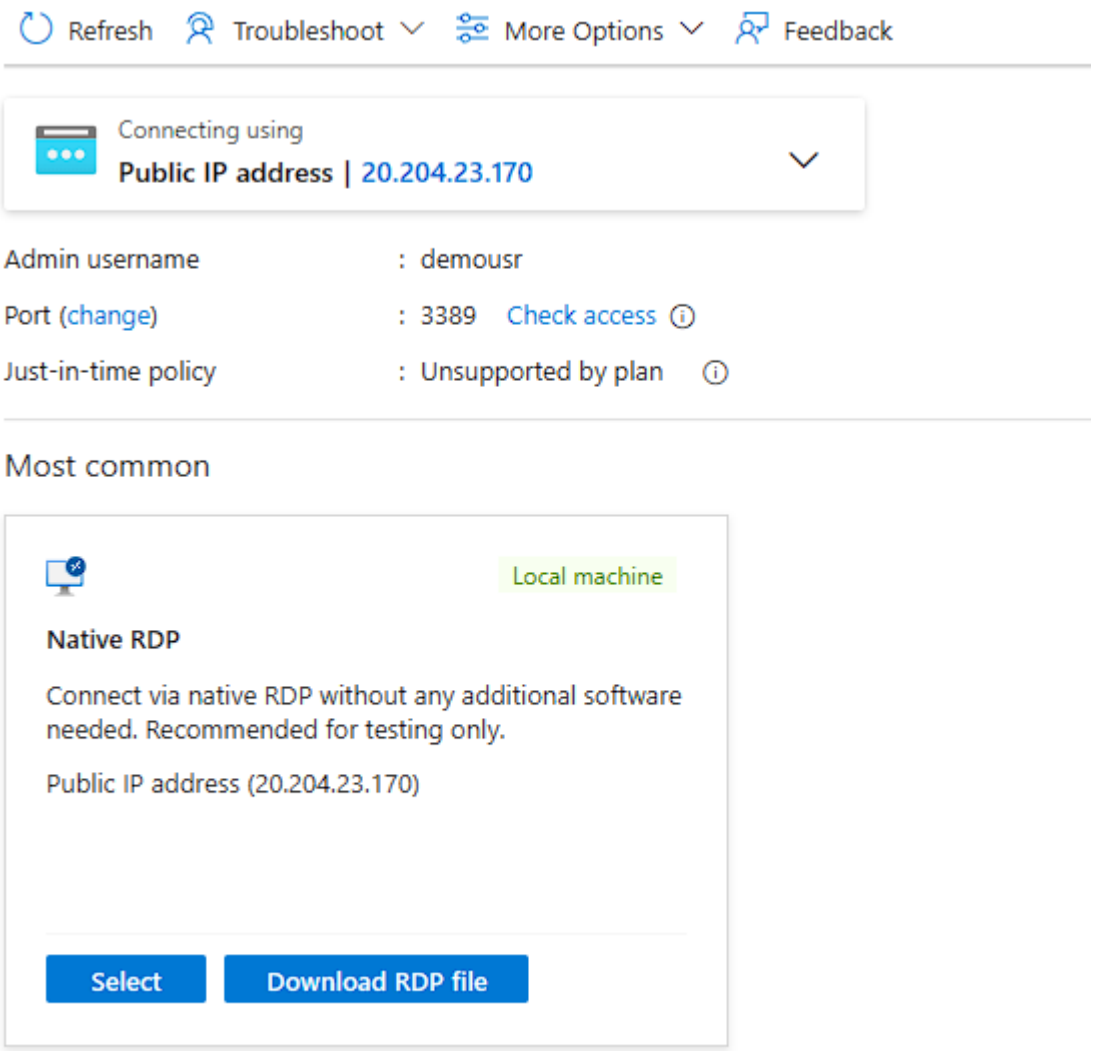
2. On the next page that is, on the data disk page, create and attach a new disk to it.



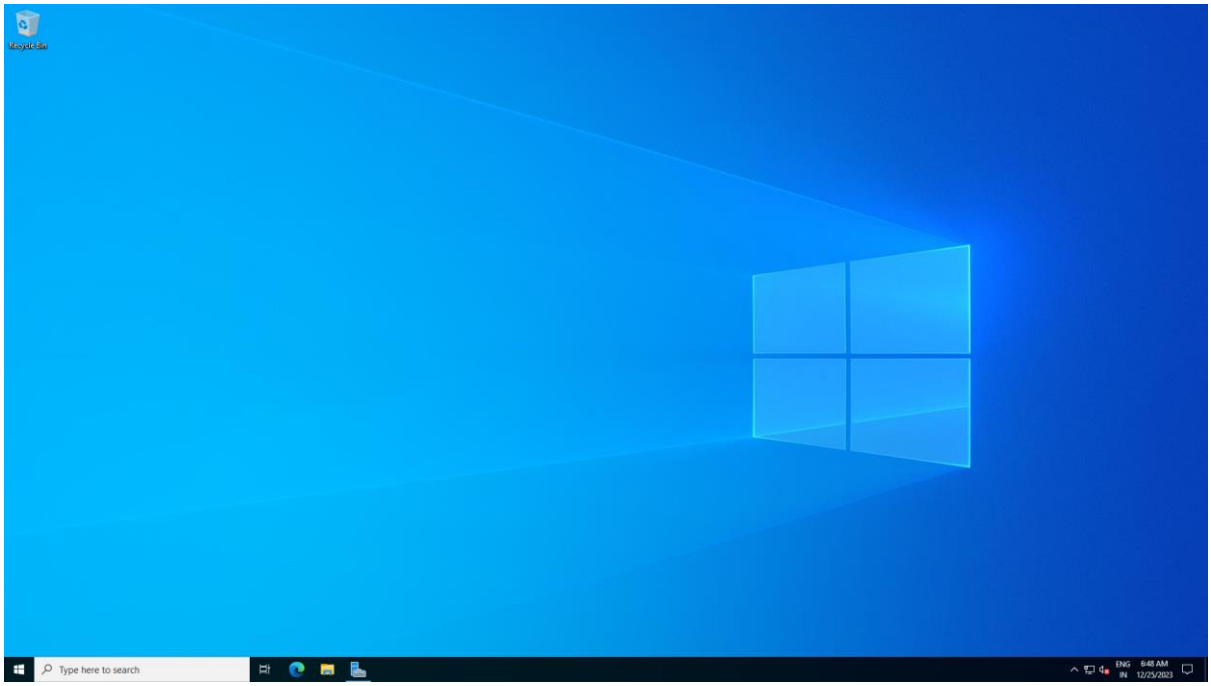
3. Now move keep everything to default and move to review and create page. There just create your virtual machine.
4. Now wait for the deployment to get completed.



5. As the deployment is completed go to the resource page and download its RPD file and open your virtual machine.

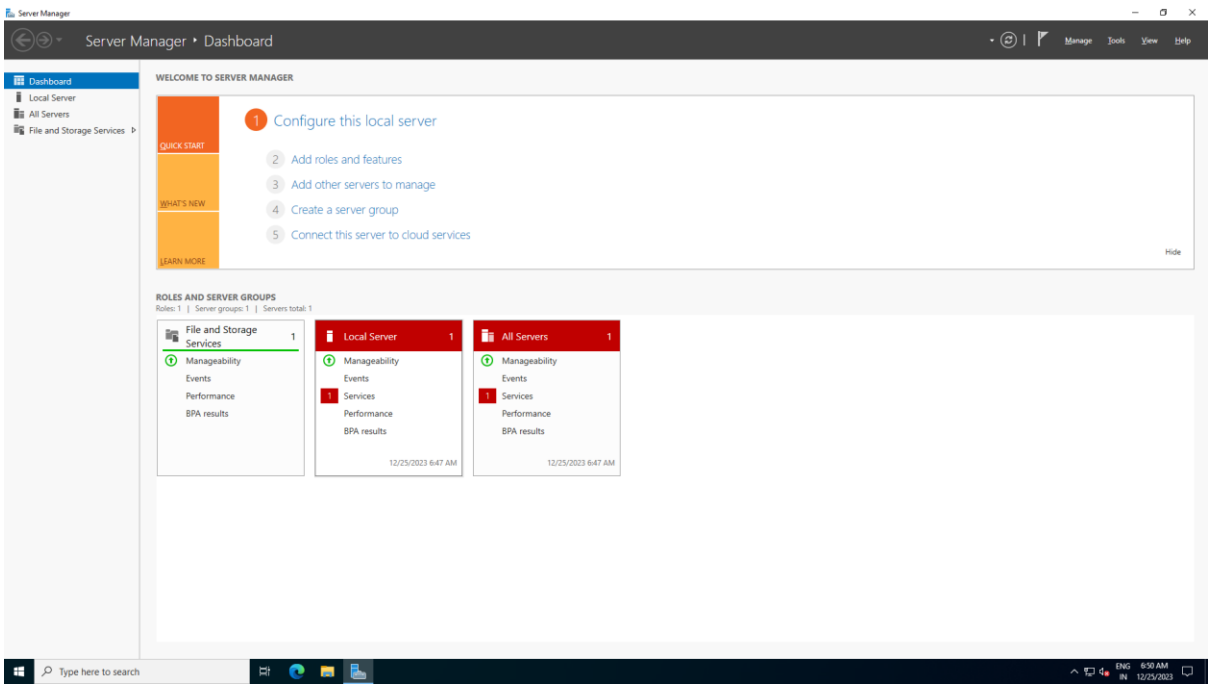


6. Now open your virtual machine.

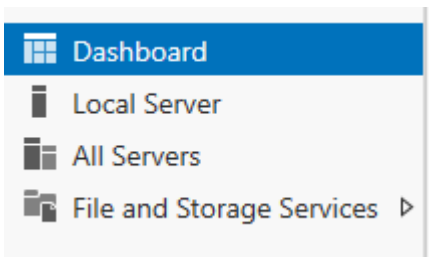


STEP 2: INITAILIZE YOUR NEW DISK

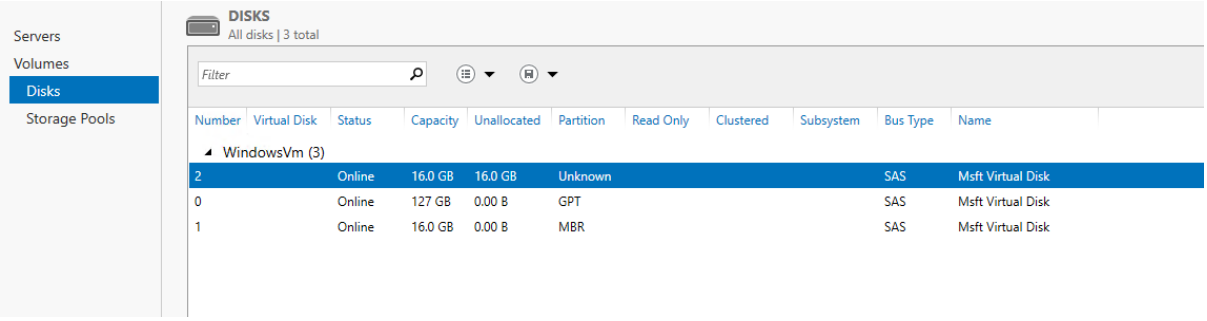
1. Inside your virtual machine, go to server manager dashboard.



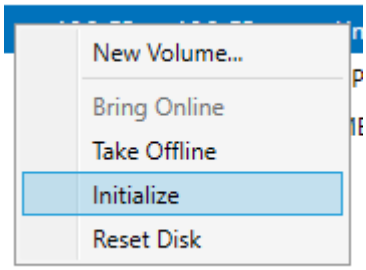
2. Here you need to click on File and Storage Services.

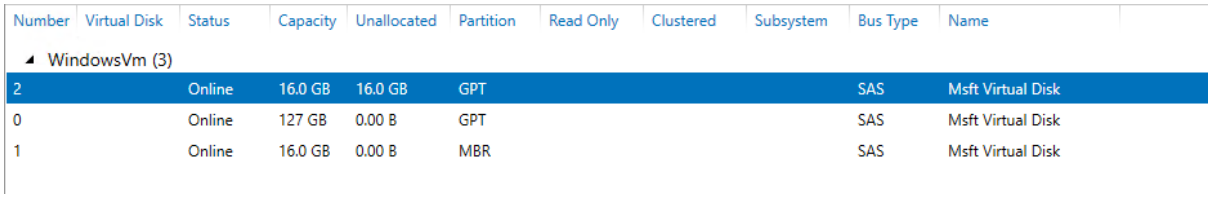


3. Inside file and storage services click on Disks, here you can see that you have an unallocated 16GB of storage.

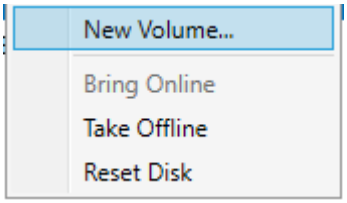


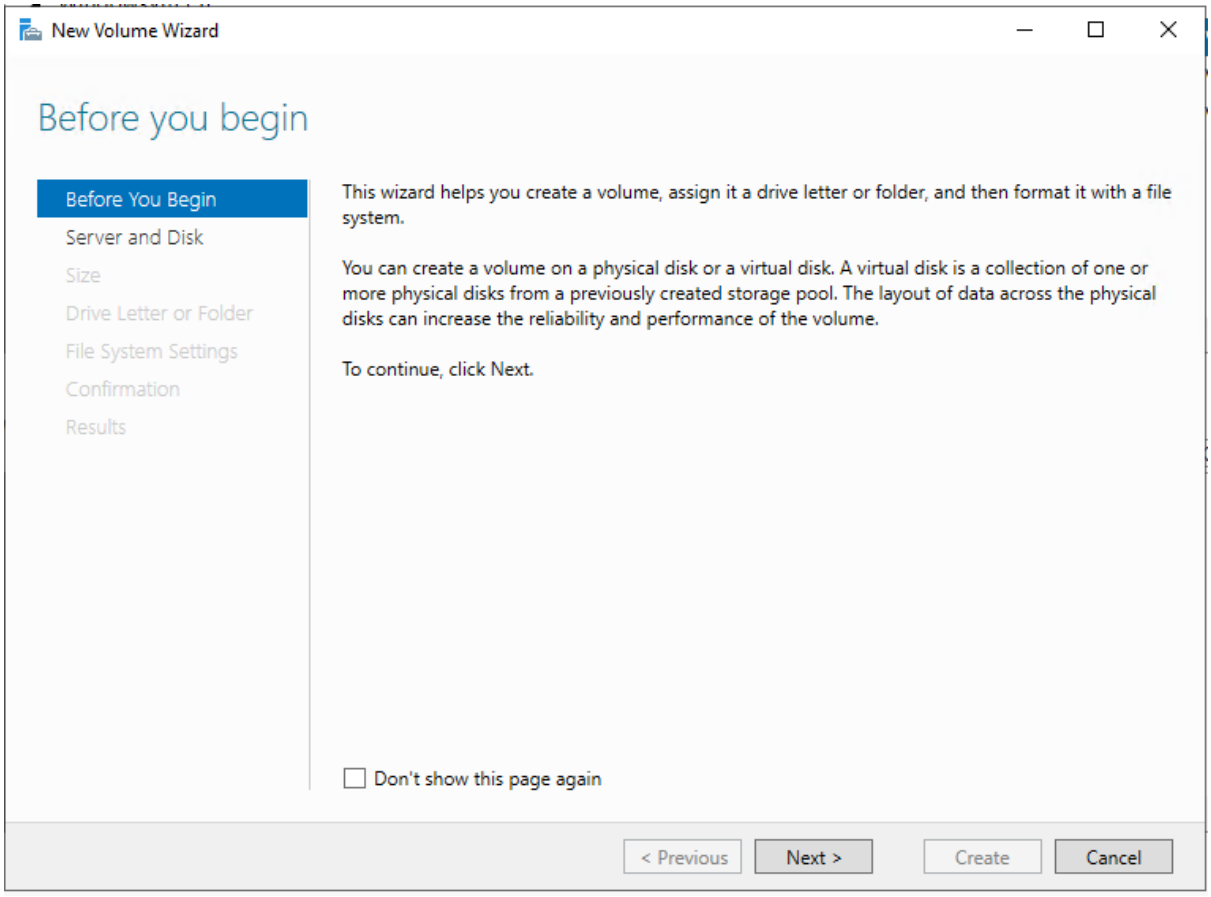
4. Right click on it, then initialize it.

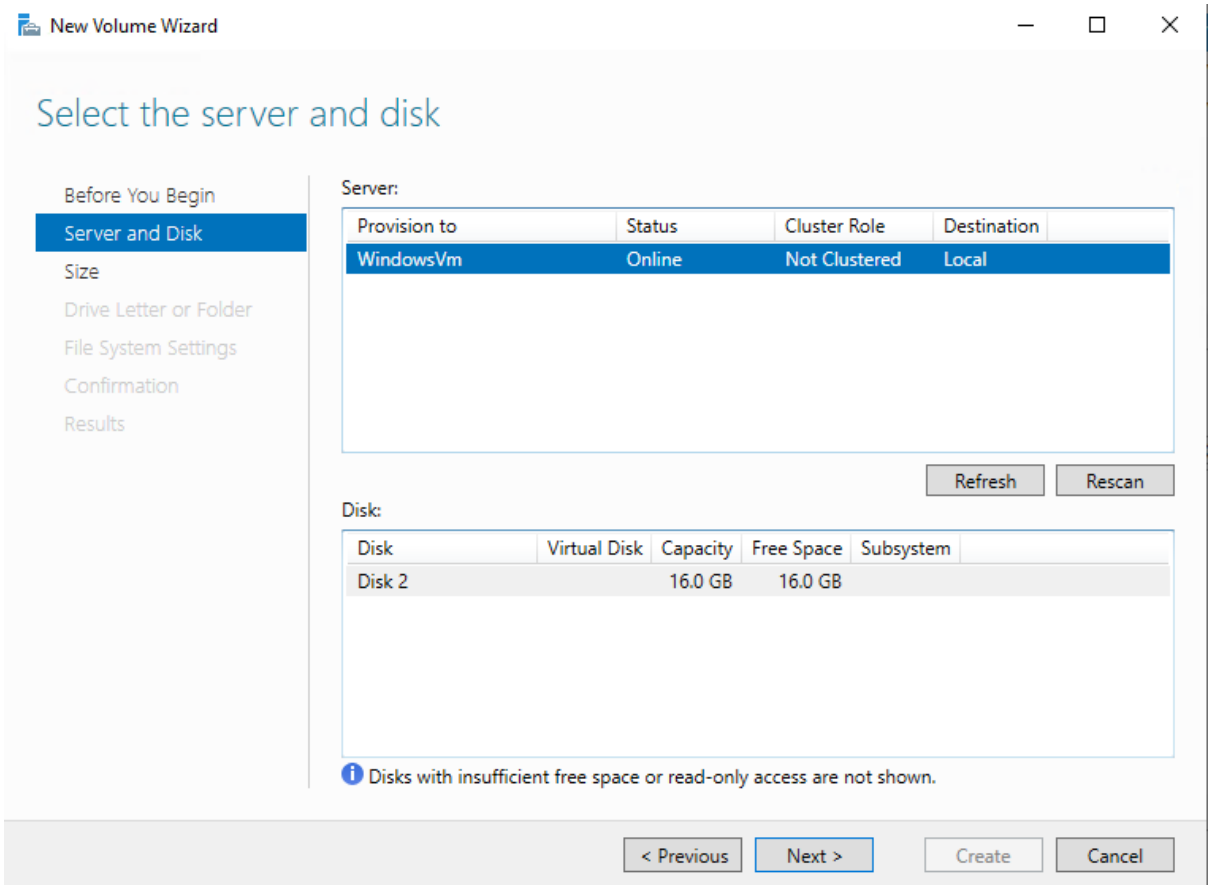


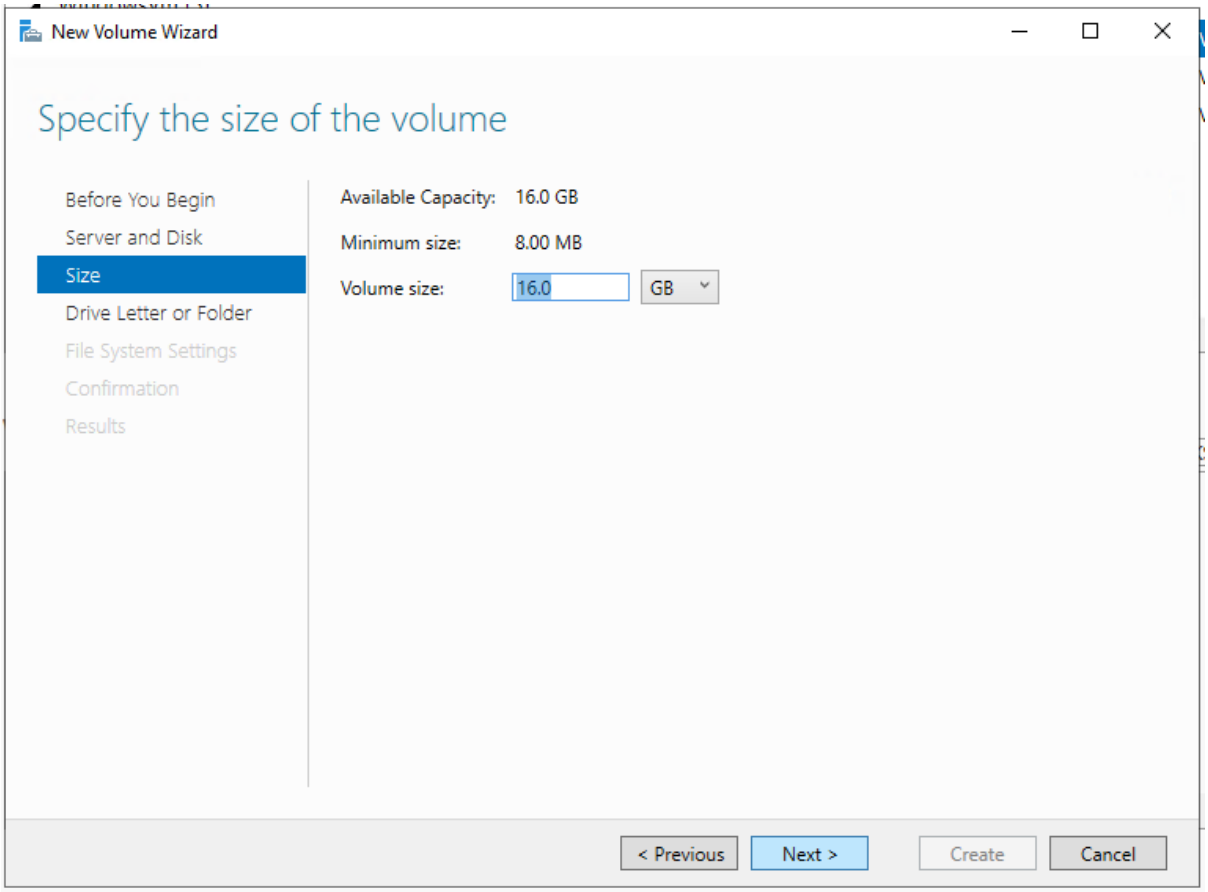


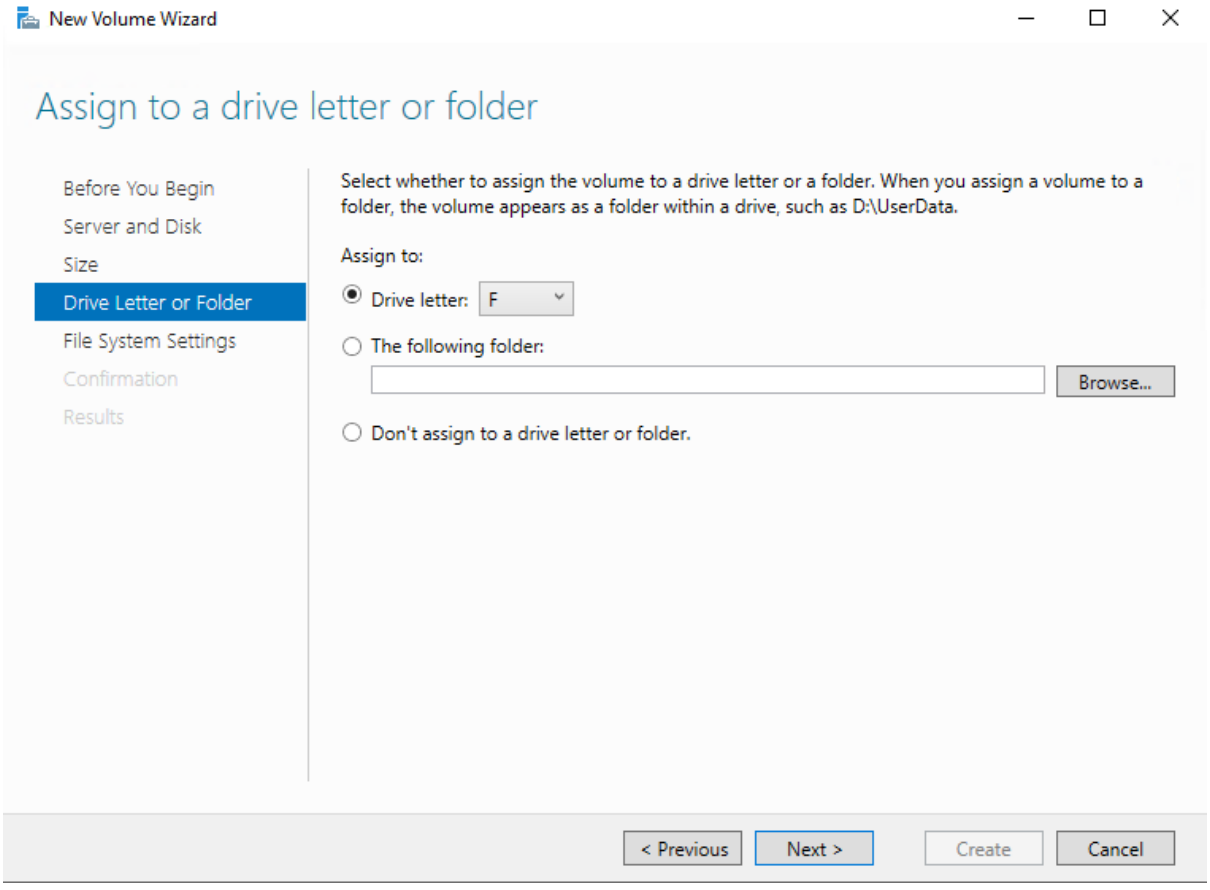
5. Again, right click on it, but this time click on new volume. Now complete the process and create a new disk in the virtual machine.

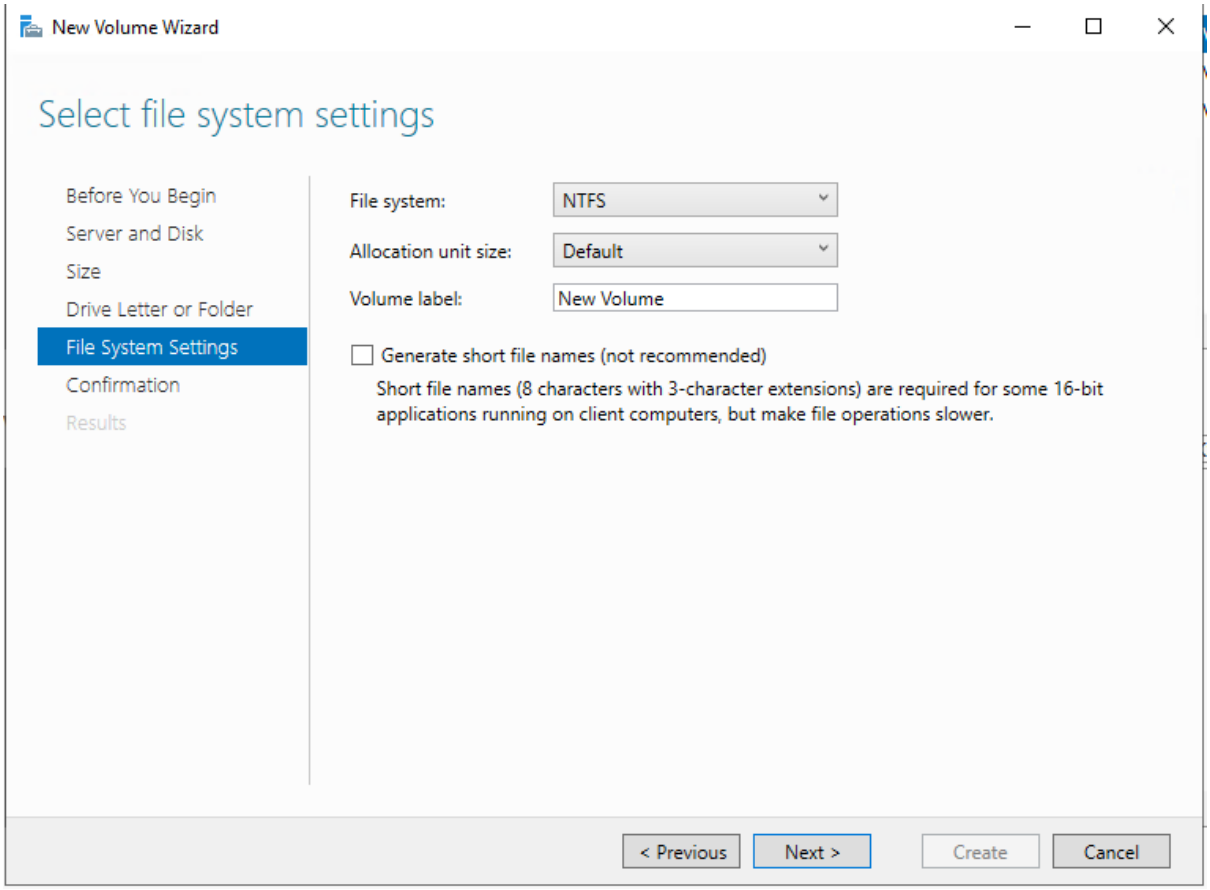


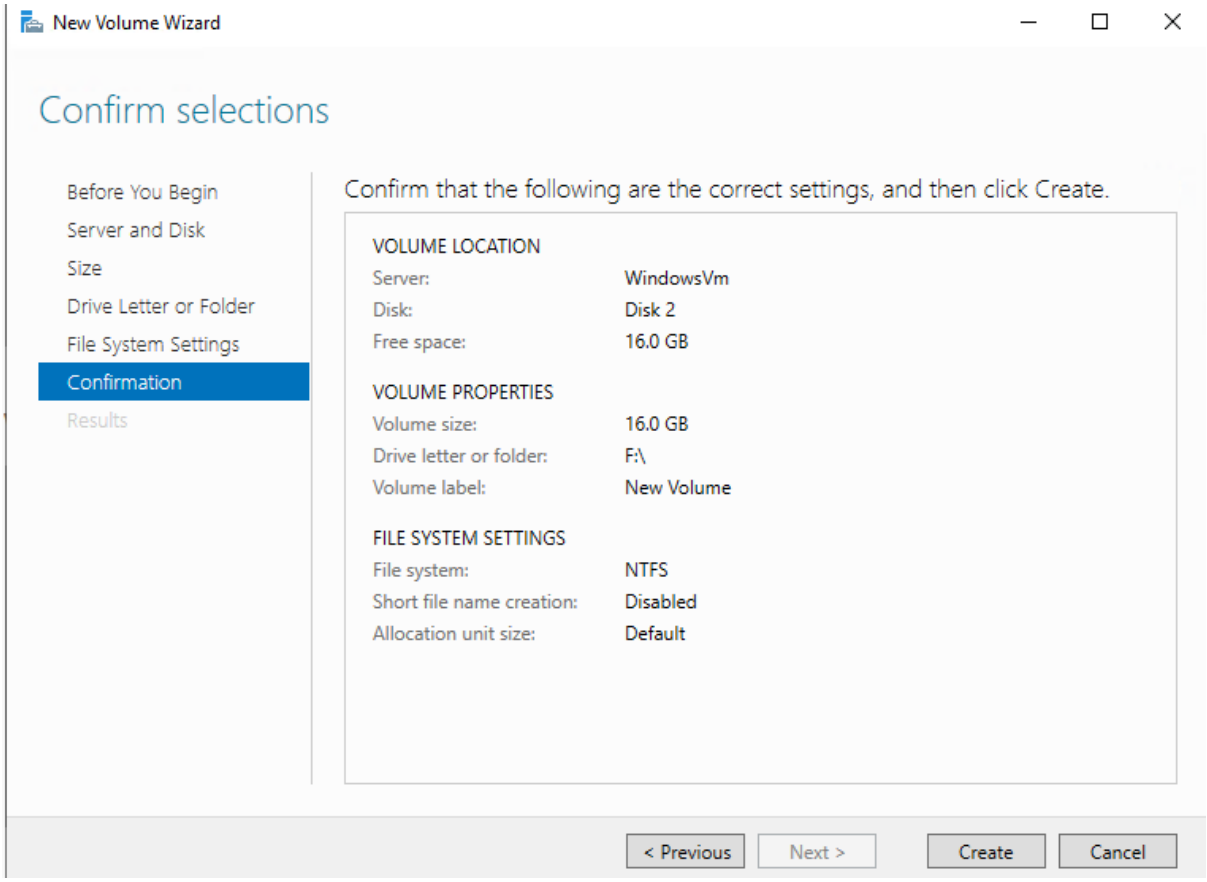

New Volume Wizard
Before you begin
Before You Begin
Server and Disk
Size
Drive Letter or Folder
File System Settings
Confirmation
Results
This wizard helps you create a volume, assign it a drive letter or folder, and then format it with a file system.
You can create a volume on a physical disk or a virtual disk. A virtual disk is a collection of one or more physical disks from a previously created storage pool. The layout of data across the physical disks can increase the reliability and performance of the volume.
To continue, click Next.
Don't show this page again
< Previous
Next >
Create
Cancel

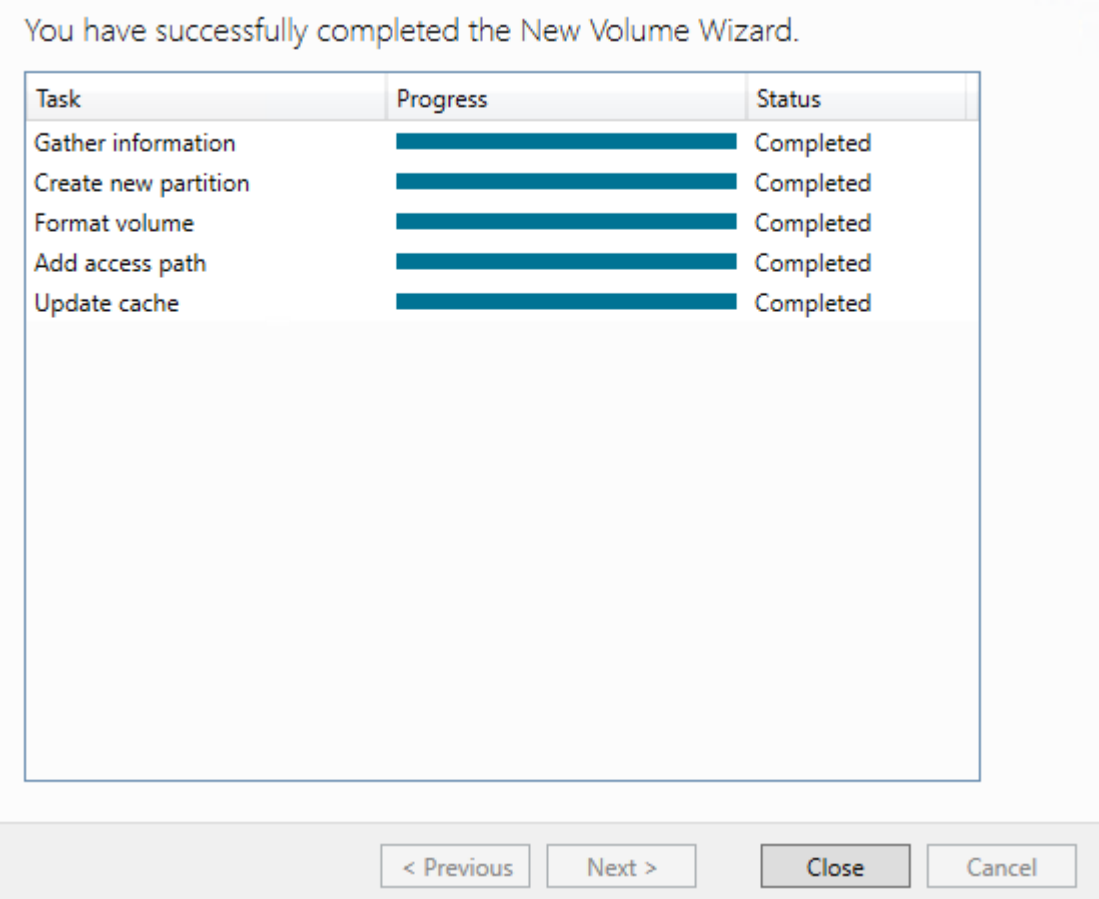

New Volume Wizard
Select the server and disk
Before You Begin
Server and Disk
Size
Drive Letter or Folder
File System Settings
Confirmation
Results
Server:
Provision to
Status
Cluster Role
Destination
WindowsVm
Online
Not Clustered
Local
Refresh
Rescan
Disk:
Disk
Virtual Disk
Capacity
Free Space
Subsystem
Disk 2
16.0 GB
16.0 GB
Disks with insufficient free space or read-only access are not shown.
< Previous
Next >
Create
Cancel


New Volume Wizard
Specify the size of the volume
Before You Begin
Server and Disk
Size
Drive Letter or Folder
File System Settings
Confirmation
Results
Available Capacity: 16.0 GB
Minimum size: 8.00 MB
Volume size: 16.0 GB
< Previous
Next >
Create
Cancel

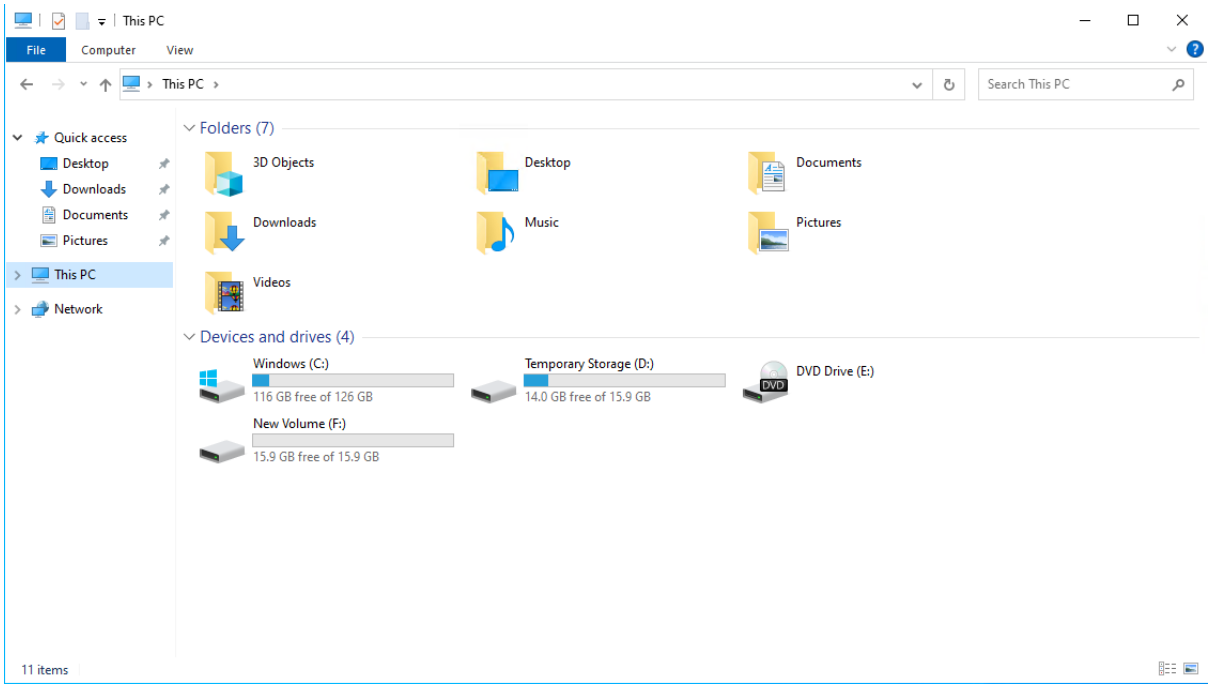

New Volume Wizard
Assign to a drive letter or folder
Before You Begin
Server and Disk
Size
Drive Letter or Folder
File System Settings
Confirmation
Results
Select whether to assign the volume to a drive letter or a folder. When you assign a volume to a folder, the volume appears as a folder within a drive, such as D:\UserData.
Assign to:
Drive letter: F
The following folder:
Browse...
Don't assign to a drive letter or folder.
< Previous
Next >
Create
Cancel


New Volume Wizard
Select file system settings
Before You Begin
Server and Disk
Size
Drive Letter or Folder
File System Settings
Confirmation
Results
File system:
NTFS
Allocation unit size:
Default
Volume label:
New Volume
Generate short file names (not recommended)
Short file names (8 characters with 3-character extensions) are required for some 16-bit applications running on client computers, but make file operations slower.
< Previous
Next >
Create
Cancel

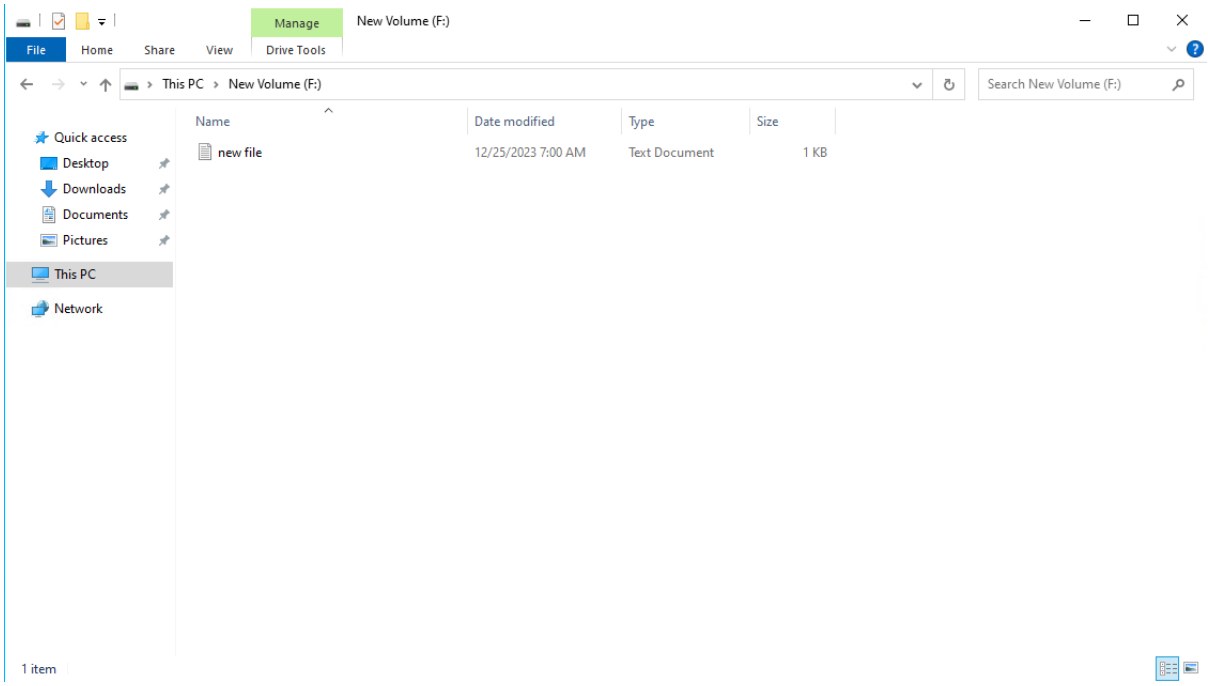

New Volume Wizard
Confirm selections
Before You Begin
Server and Disk
Size
Drive Letter or Folder
File System Settings
Confirmation
Results
Confirm that the following are the correct settings, and then click Create.
VOLUME LOCATION
Server: WindowsVm
Disk: Disk 2
Free space: 16.0 GB
VOLUME PROPERTIES
Volume size: 16.0 GB
Drive letter or folder: F:\
Volume label: New Volume
FILE SYSTEM SETTINGS
File system: NTFS
Short file name creation: Disabled
Allocation unit size: Default
< Previous
Next >
Create
Cancel



6. After the creation of new disk, go to file manager, you'll see a new disk ready for use.

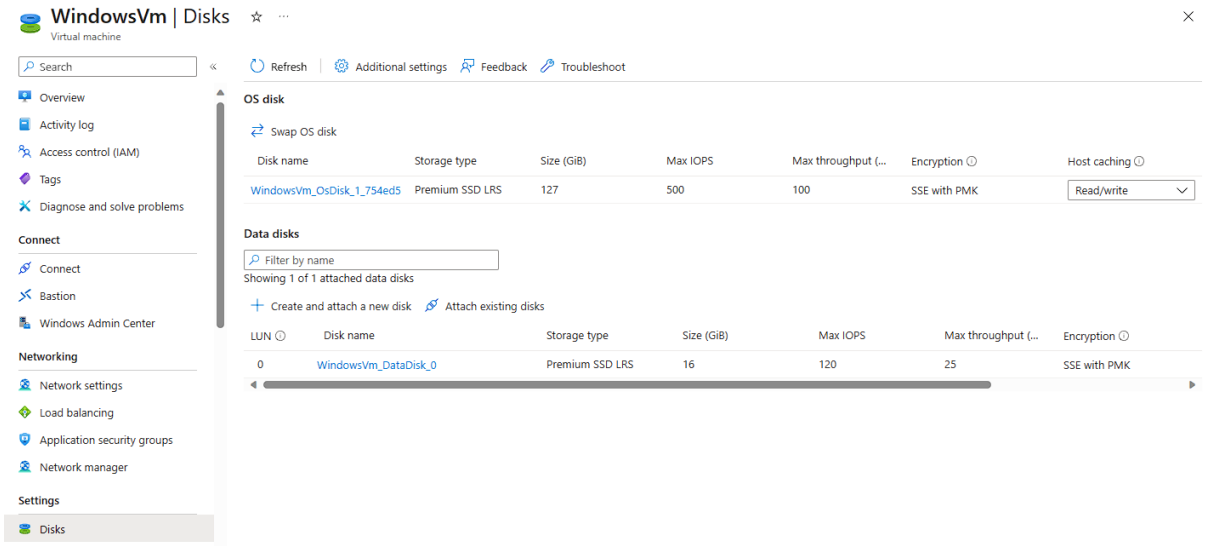


7. Now you need to create a .txt file and save it on the new disk. For that open Notepad and write something on it, then save it on the new disk.

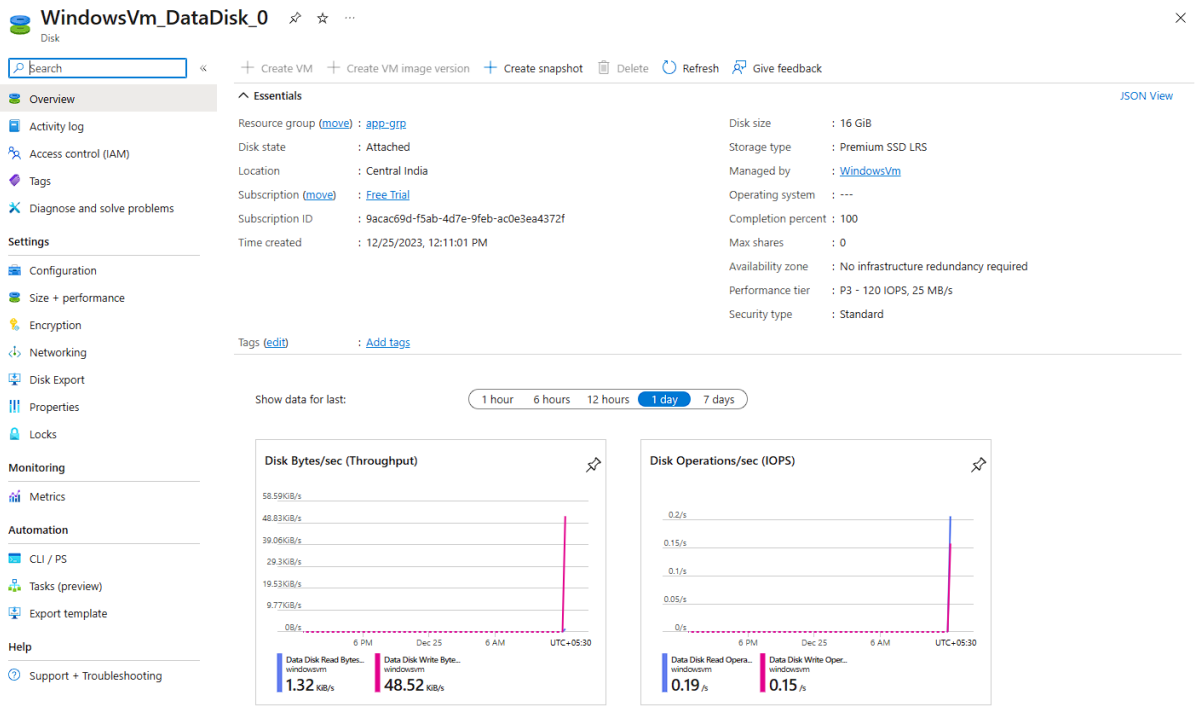


STEP 3: CREATE A SNAPSHOT

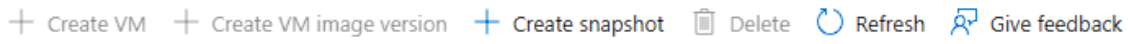
1. Now go back to the portal.
2. On the portal navigate to disks section.



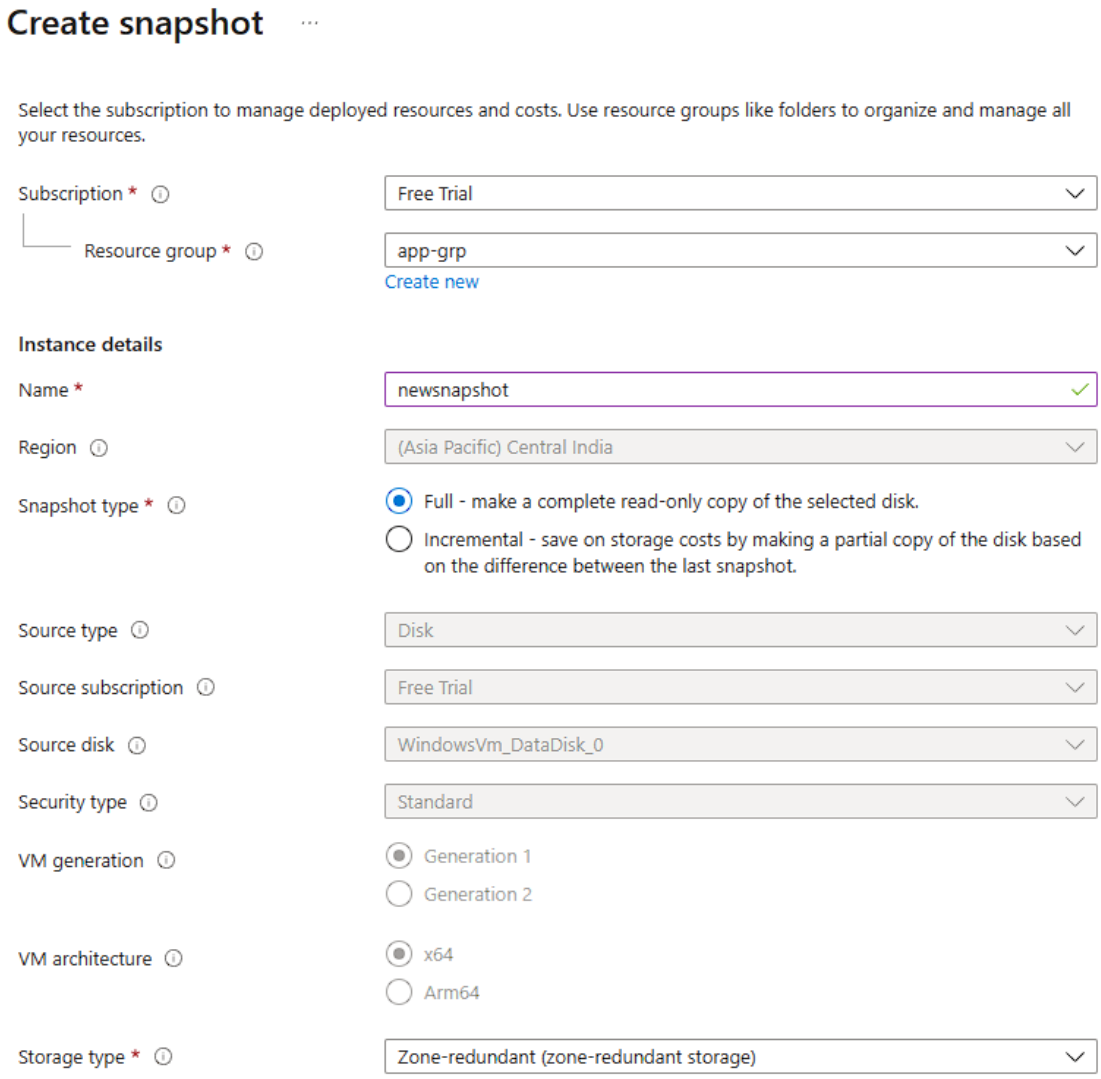
3. Open the 16GB disk. Here you can see everything about the disk.



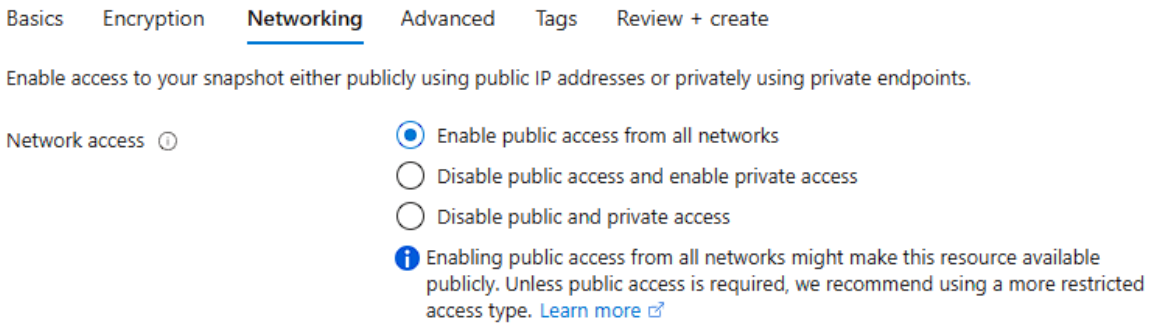
4. Now click on create snapshot.



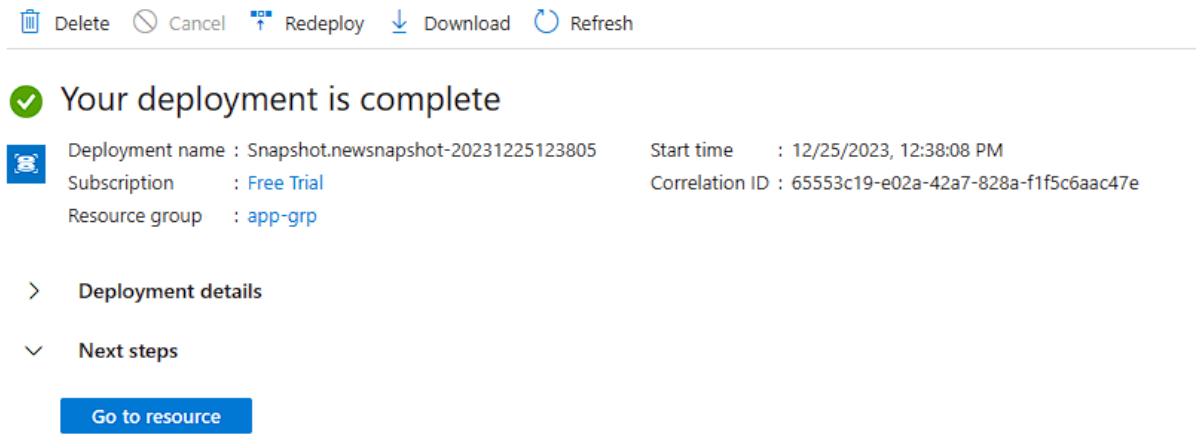
5. Here you need to give it a name and select type as read only.



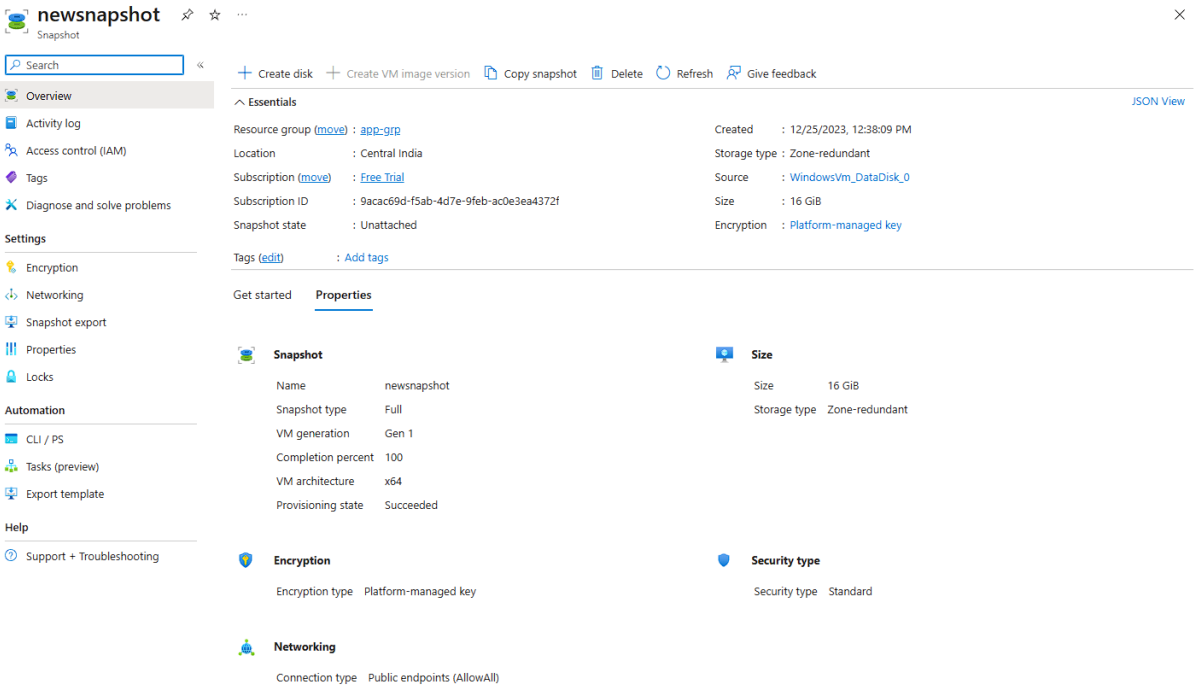
6. On the networking, click on enable public access from all networks.



7. Now simply go to review and create. There create your snapshot.



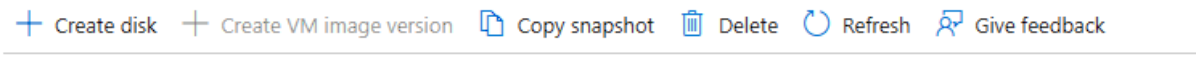
8. Once the deployment is complete go back to the resources.



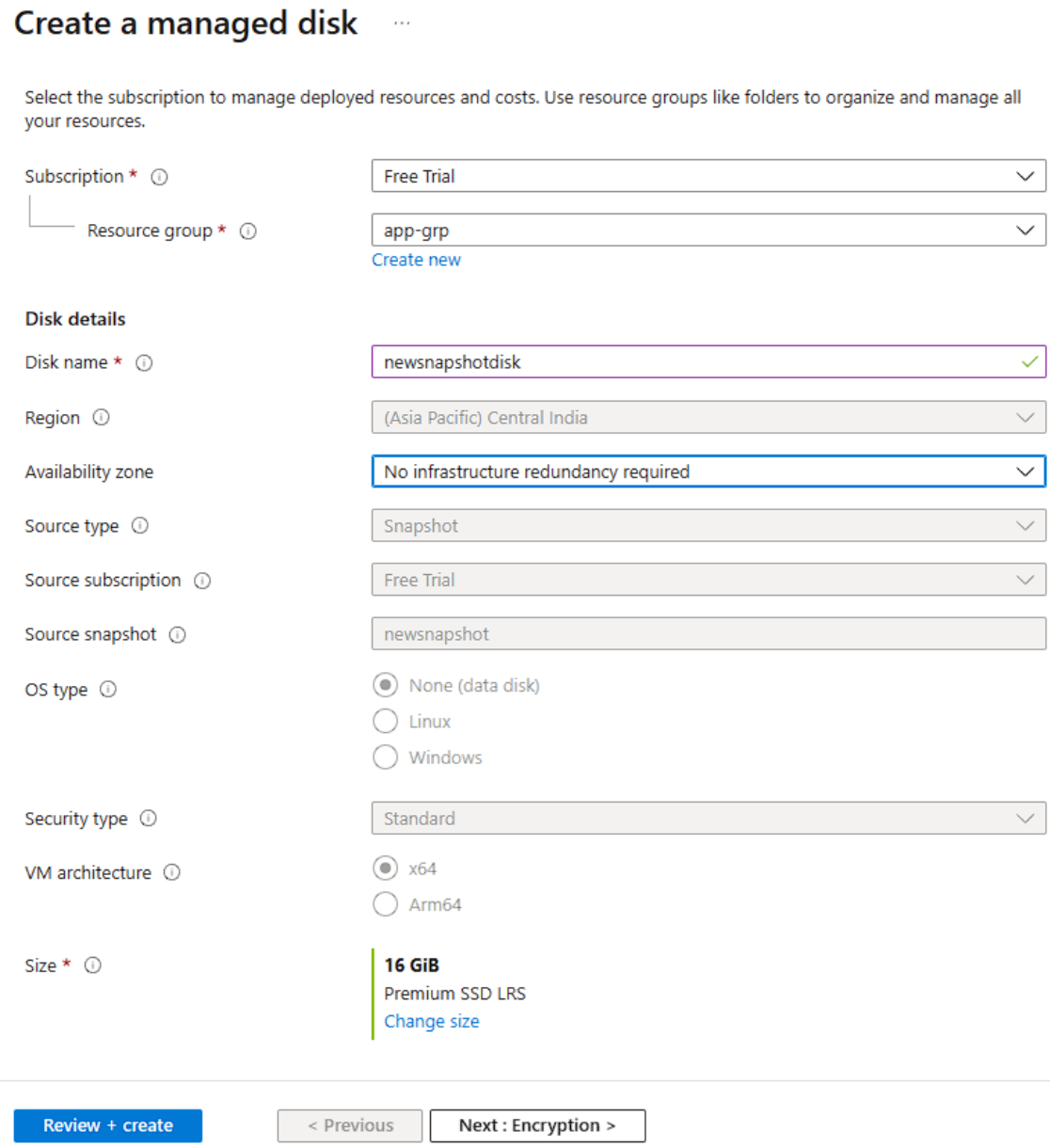
9. Here, you can see the snapshot is created.

STEP 4: CREATE A NEW DISK OUT OF THE SNAPSHOT

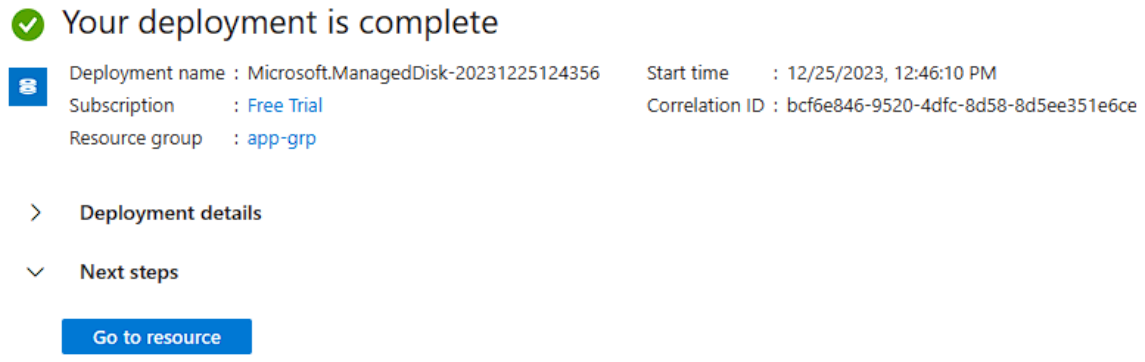
1. As you can see on the new snapshot screen, you can create a new disk from this snapshot.
2. Click on the create disk option.



3. Give it a name and in the availability, zone select No infrastructure redundancy required. Go to next page.

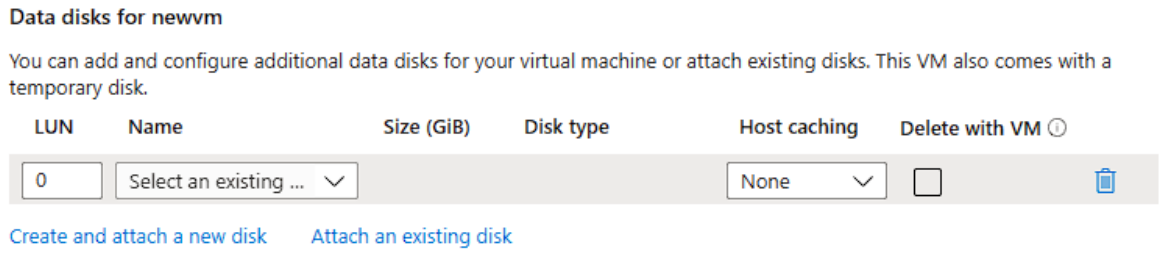


4. Keep all the aspect as it is and go to review and create page. Now create that disk.

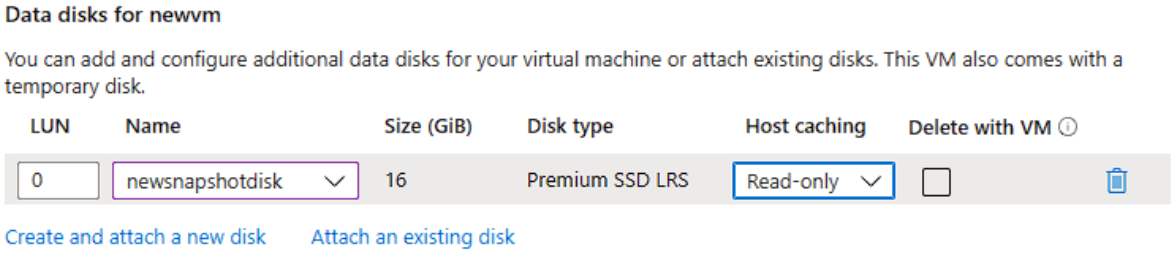


STEP 5: CREATE A NEW WINDOWS VIRTUAL MACHINE

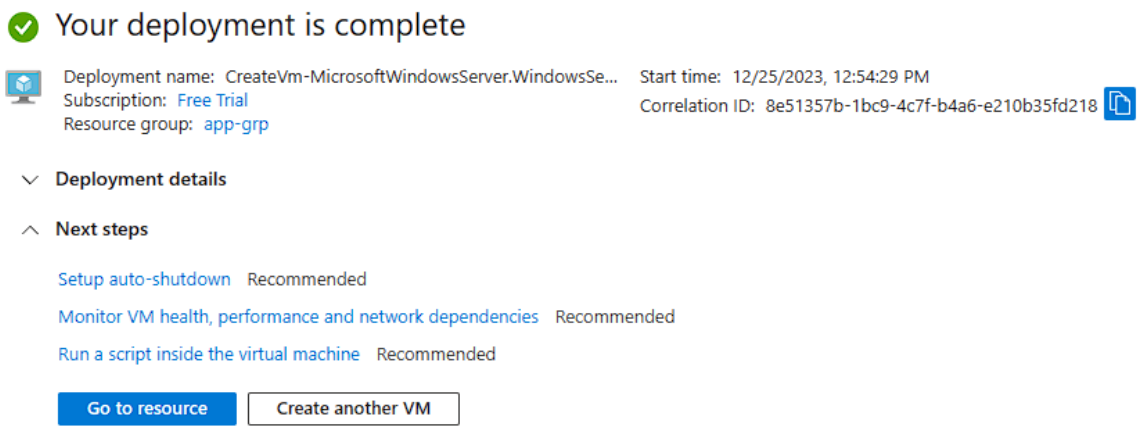
1. It is now necessary for you to construct a new Windows virtual machine and attach the updated new snapshot disk to it.
2. Now go to create virtual machine page and create a new machine.
3. On the disks page, click on attach an existing disk, here you can see the disk that you created through the snapshot.



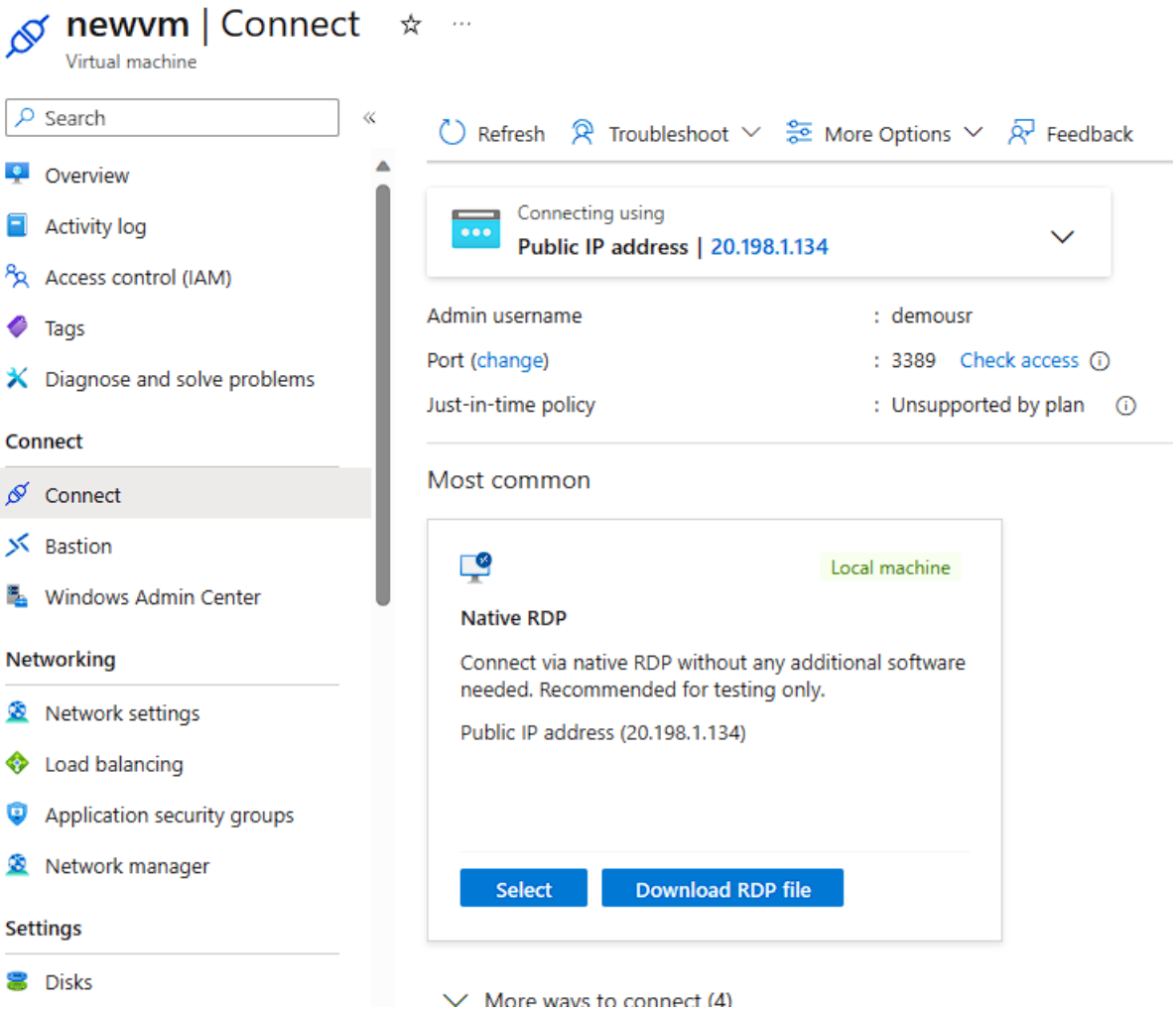
4. Select the snapshot disk and move to review and create page.



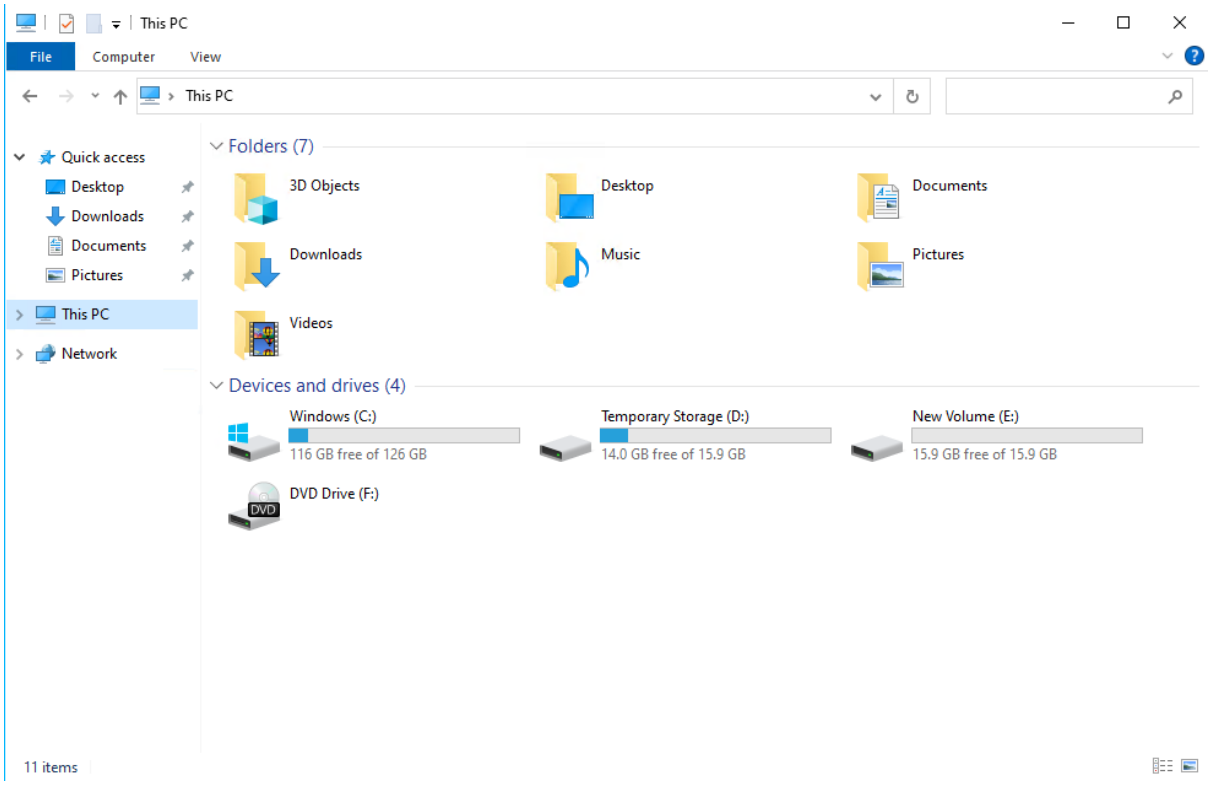
5. Now create your new virtual machine.



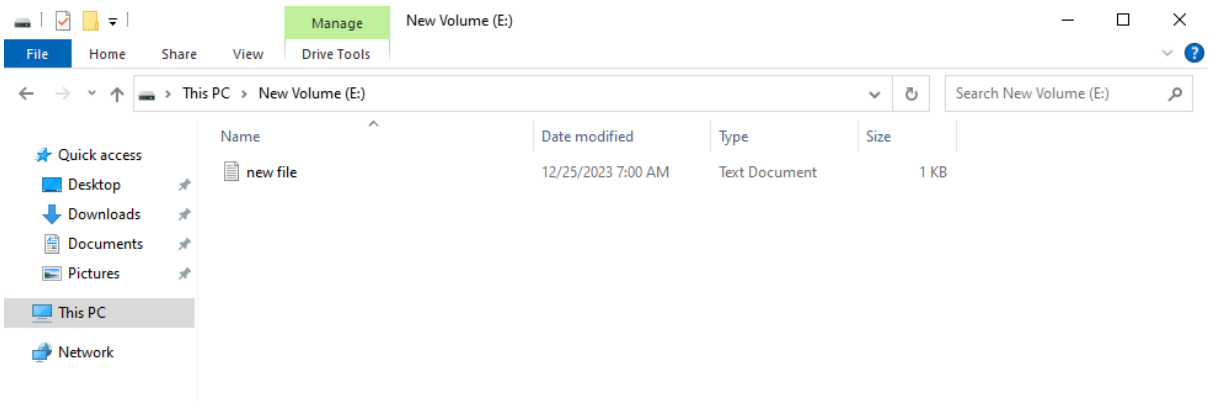
6. Now go to resources and connect to the virtual machine by downloading RDP file.



7. Once you are in the virtual machine there is no need to initialize the disk this time.
8. Just go to file manager, there you can see the new disk.



9. Now if you will open the New Volume (E), you can see you document here.



STEP 6: DELETE ALL THE RESOURCES WITH THE DISKS.