

# 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.

#### Create a virtual machine ...

Basics Disks Networking Management Monitoring Advanced Tags Review + create

Create a virtual machine that runs Linux or Windows. Select an image from Azure marketplace or use your own customized image. Complete the Basics tab then Review + create to provision a virtual machine with default parameters or review each tab for full customization. [Learn more](#)

i This subscription may not be eligible to deploy VMs of certain sizes in certain regions.

#### Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription \* ⓘ

Free Trial

Resource group \* ⓘ

app-grp

[Create new](#)

#### Instance details

Virtual machine name \* ⓘ

WindowsVm

Region \* ⓘ

(Asia Pacific) Central India

Availability options ⓘ

No infrastructure redundancy required

Security type ⓘ

Standard

Image \* ⓘ

 Windows Server 2022 Datacenter - x64 Gen2 (free services eligible)

[See all images](#) | [Configure VM generation](#)

i This image is compatible with additional security features. [Click here to swap to the Trusted launch security type](#).

**Info** You are in the free trial period. Costs associated with this VM can be covered by any remaining credits on your subscription. [Learn more ↗](#)

Size \* ⓘ Standard\_D2s\_v3 - 2 vcpus, 8 GiB memory (₹11,294.05/month) ▼

[See all sizes](#)

Enable Hibernation (preview) ⓘ

**Info** To enable Hibernation, you must register your subscription. [Learn more ↗](#)

**Administrator account**

Username \* ⓘ demouser ✓

Password \* ⓘ \*\*\*\*\* ✓

Confirm password \* ⓘ \*\*\*\*\* ✓

**Inbound port rules**

Select which virtual machine network ports are accessible from the public internet. You can specify more limited or granular network access on the Networking tab.

Public inbound ports \* ⓘ  None  Allow selected ports

Select inbound ports \* RDP (3389) ▼

**Info** All traffic from the internet will be blocked by default. You will be able to change inbound port rules in the VM > Networking page.

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

Create a new disk to store applications and data on your VM. Disk pricing varies based on factors including disk size, storage type, and number of transactions. [Learn more ↗](#)

Name \* WindowsVm\_DataDisk\_0

Source type \* ⓘ None (empty disk) ▼

Size \* ⓘ 16 GiB Premium SSD LRS Change size

Key management Platform-managed key ▼

Enable shared disk  Yes  No

Delete disk with VM

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.

## >Your deployment is complete

Deployment name: CreateVm-MicrosoftWindowsServer.WindowsSe... Start time: 12/25/2023, 12:11:00 PM  
Subscription: Free Trial Correlation ID: b41811e4-a6d8-40d5-b771-4d1b5e7ce141  
Resource group: app-grp

Deployment details

Next steps

Setup auto-shutdown Recommended  
Monitor VM health, performance and network dependencies Recommended  
Run a script inside the virtual machine Recommended

[Go to resource](#) [Create another VM](#)

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

Refresh Troubleshoot More Options Feedback

Connecting using  
**Public IP address | 20.204.23.170**

Admin username : demousr  
Port (change) : 3389 [Check access](#) ⓘ  
Just-in-time policy : Unsupported by plan ⓘ

Most common

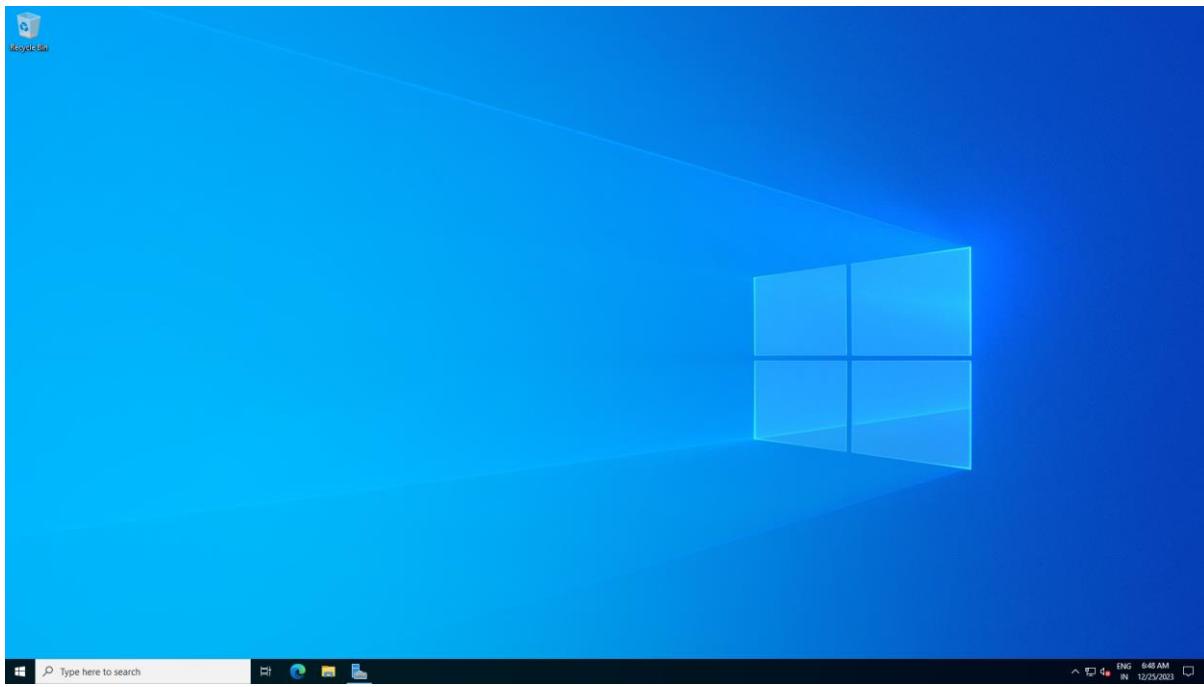
 Local machine

**Native RDP**  
Connect via native RDP without any additional software needed. Recommended for testing only.  
Public IP address (20.204.23.170)

Select Download RDP file

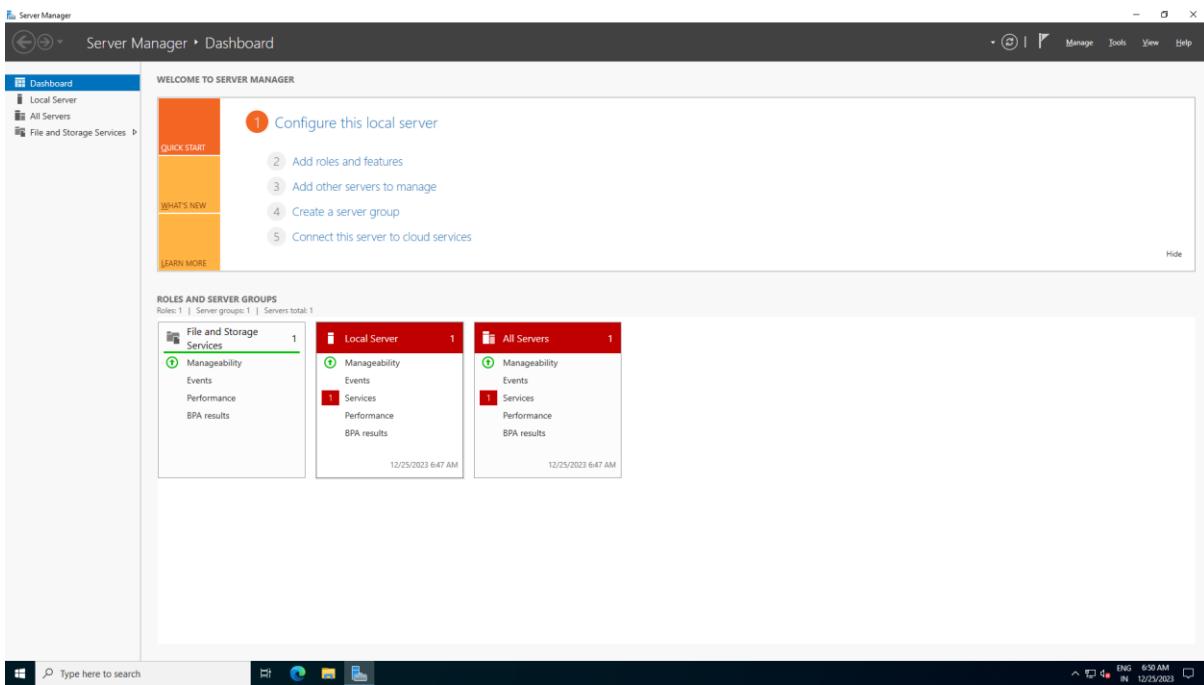
- More ways to connect (4)

- Now open your virtual machine.

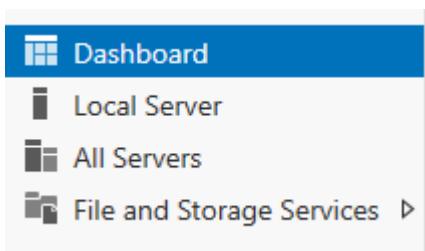


## STEP 2: INITAILIZE YOUR NEW DISK

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



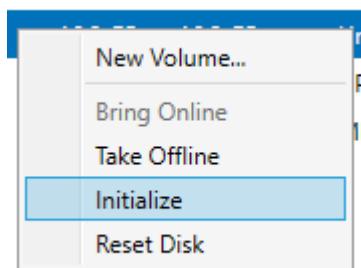
2. Here you need to click on File and Storage Services.



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

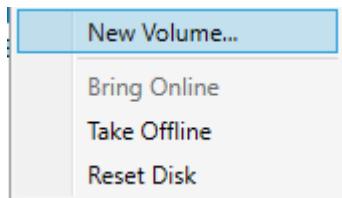
Number	Virtual Disk	Status	Capacity	Unallocated	Partition	Read Only	Clustered	Subsystem	Bus Type	Name
2		Online	16.0 GB	16.0 GB	Unknown				SAS	Msft Virtual Disk
0		Online	127 GB	0.00 B	GPT				SAS	Msft Virtual Disk
1		Online	16.0 GB	0.00 B	MBR				SAS	Msft Virtual Disk

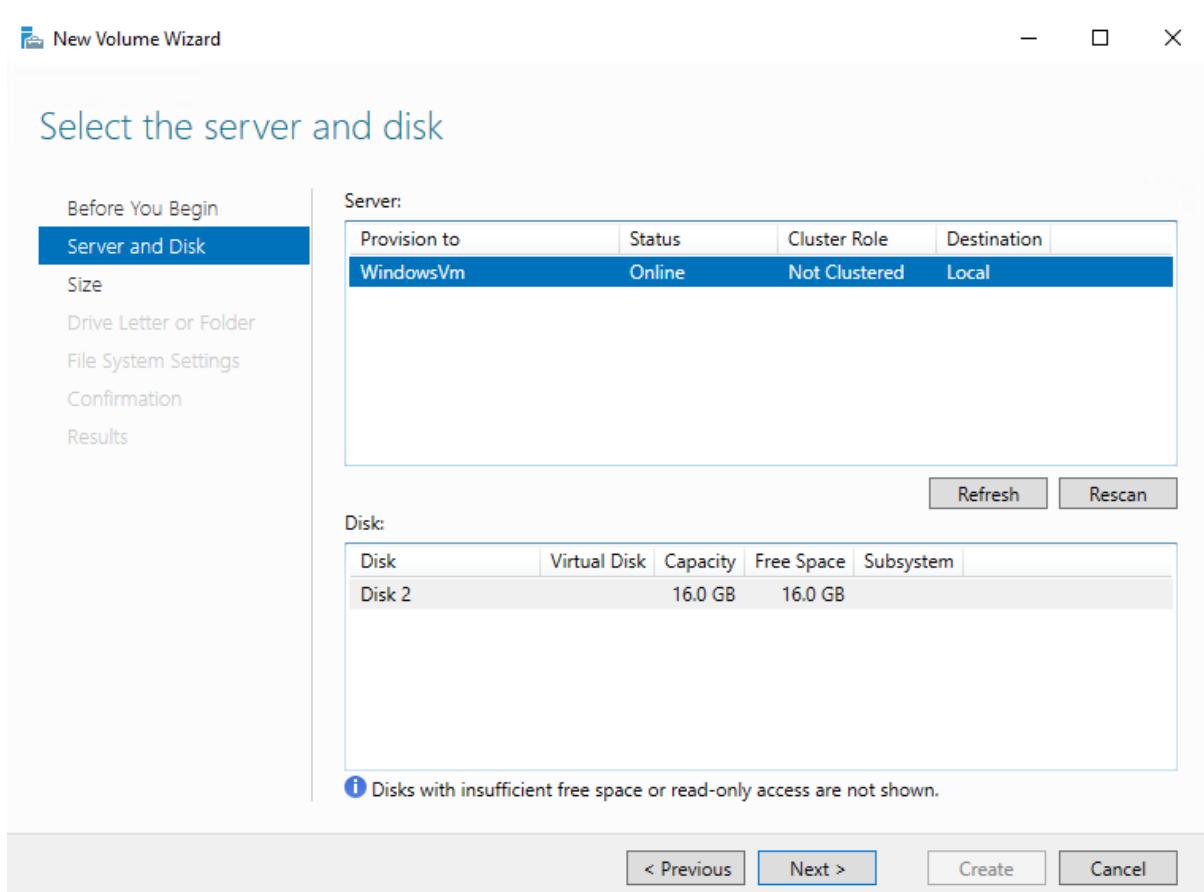
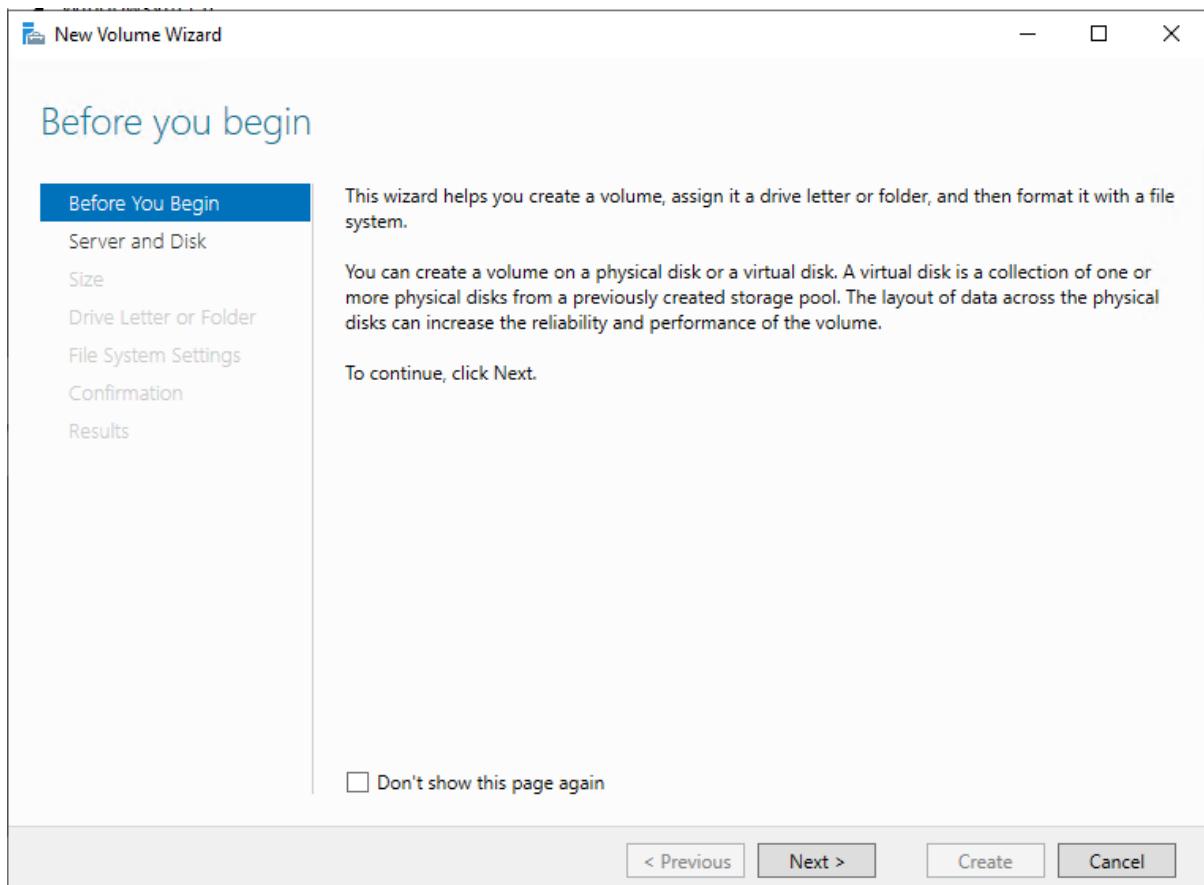
4. Right click on it, then initialize it.

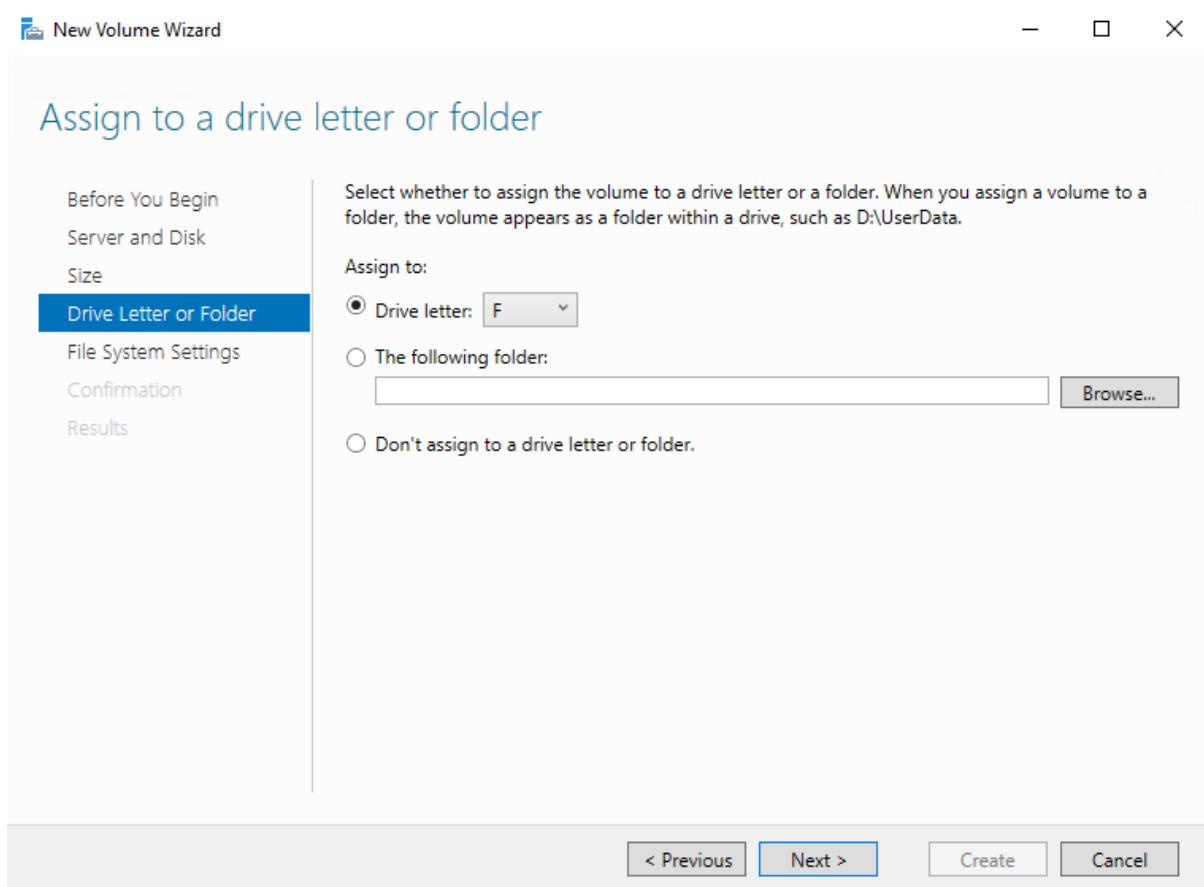
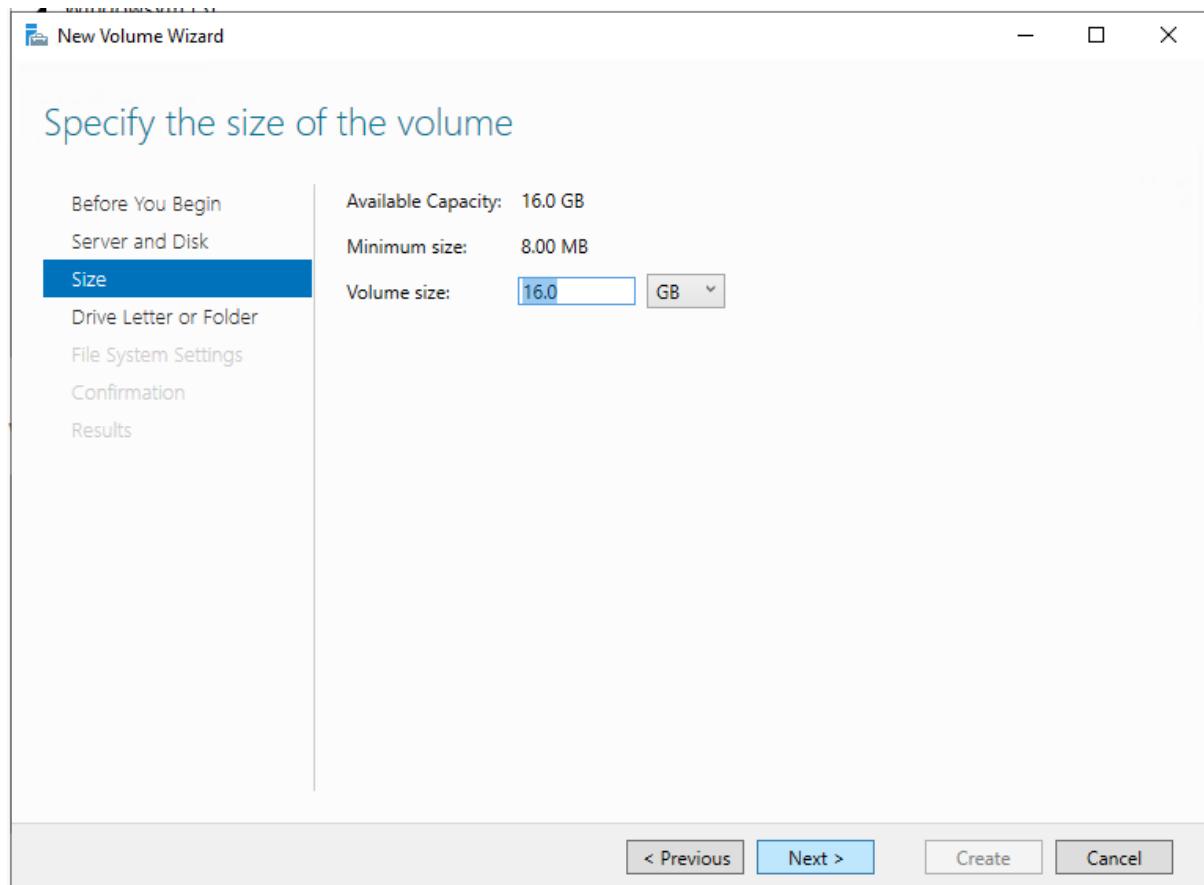


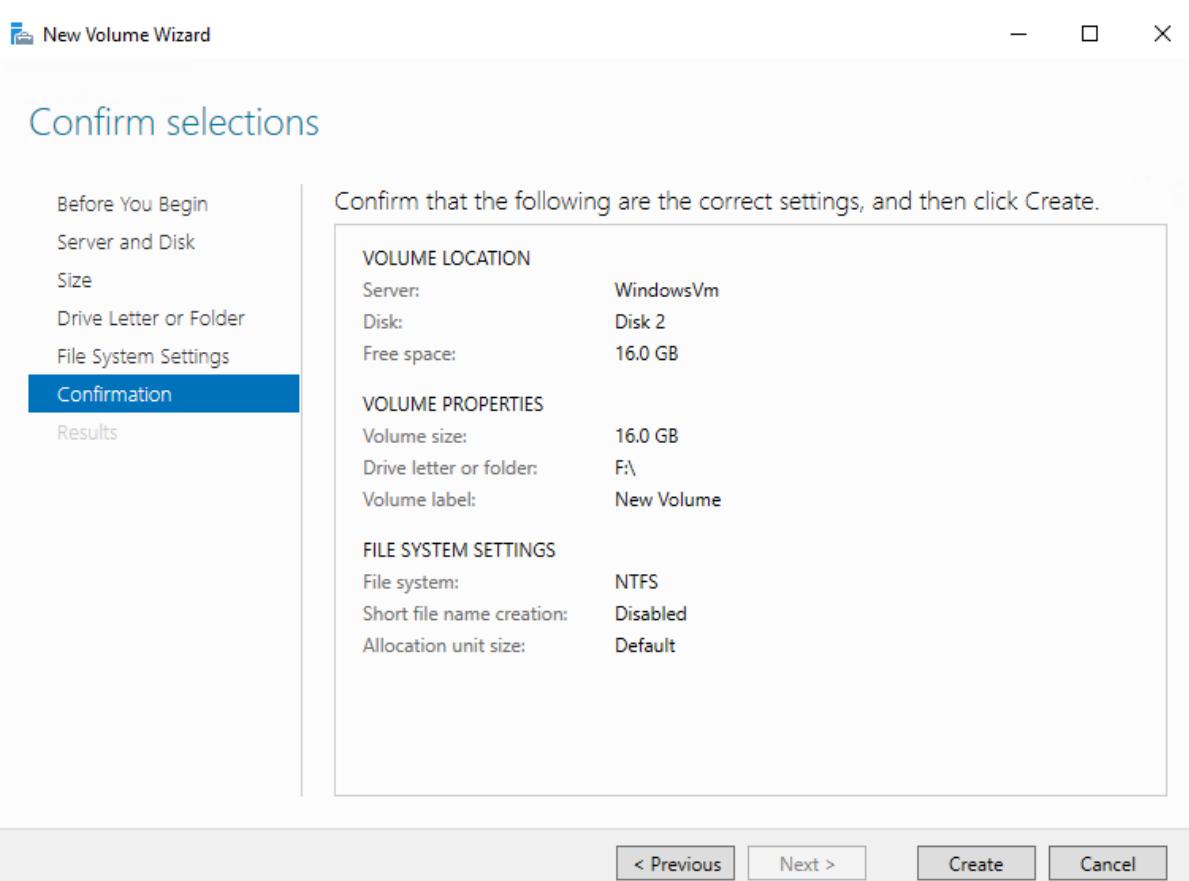
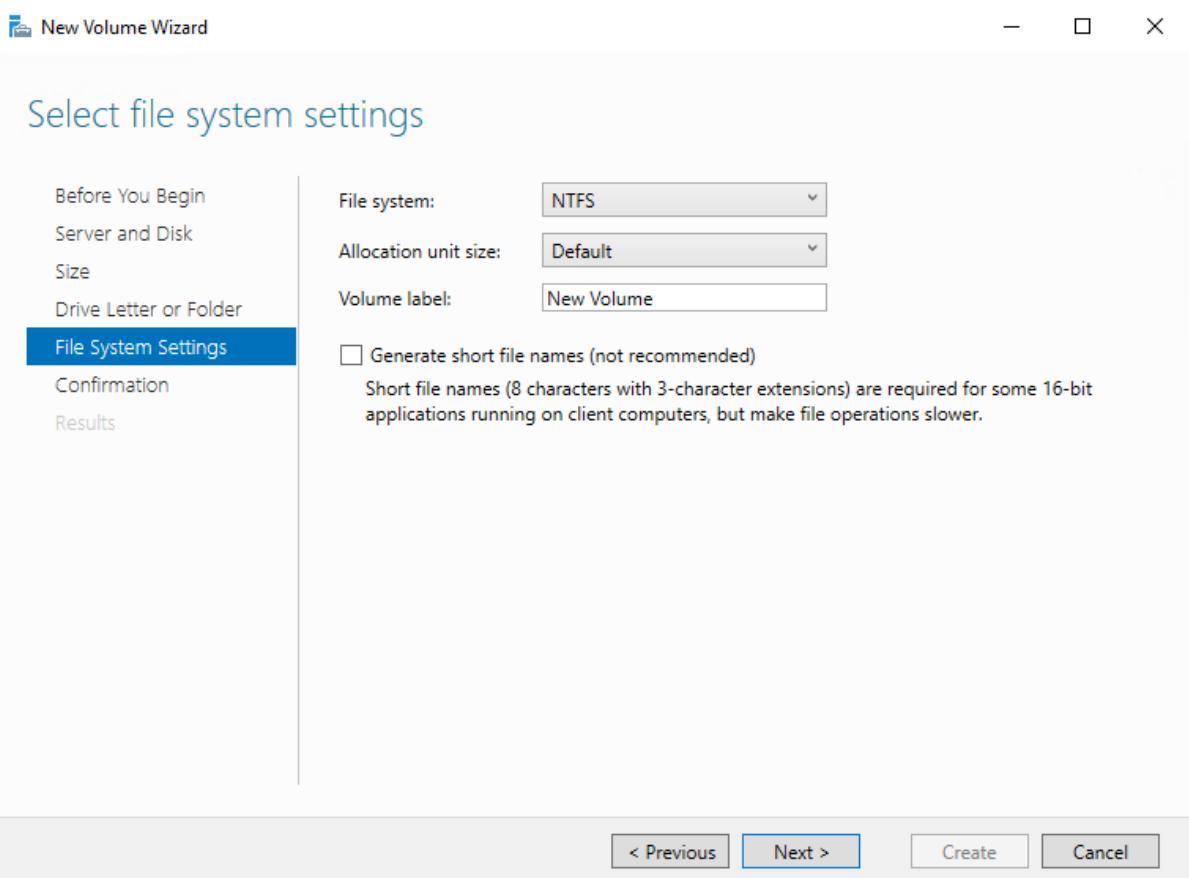
Number	Virtual Disk	Status	Capacity	Unallocated	Partition	Read Only	Clustered	Subsystem	Bus Type	Name
<b>WindowsVm (3)</b>										
2		Online	16.0 GB	16.0 GB	GPT				SAS	Msft Virtual Disk
0		Online	127 GB	0.00 B	GPT				SAS	Msft Virtual Disk
1		Online	16.0 GB	0.00 B	MBR				SAS	Msft Virtual Disk

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.

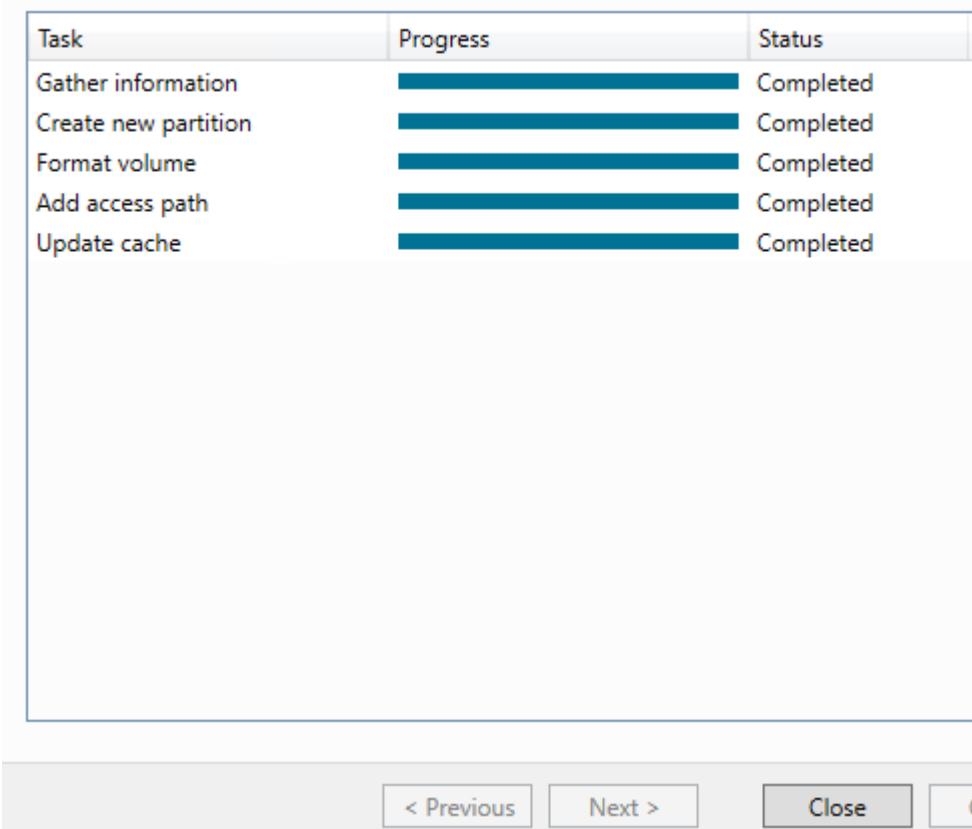




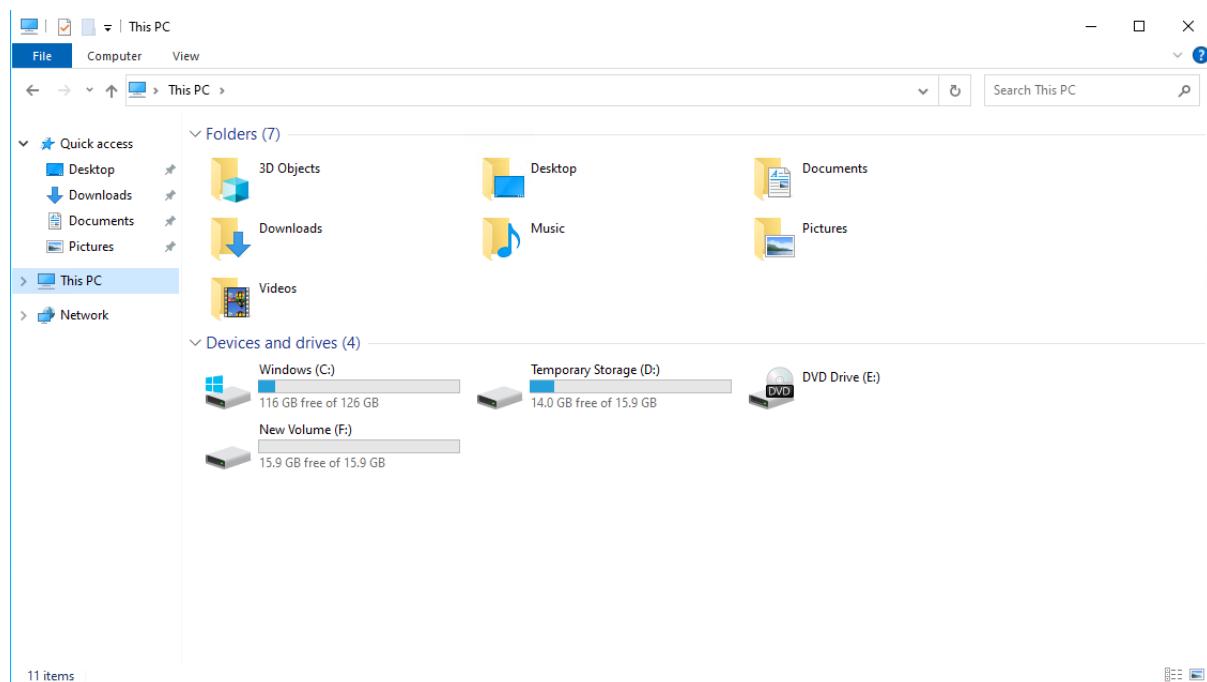




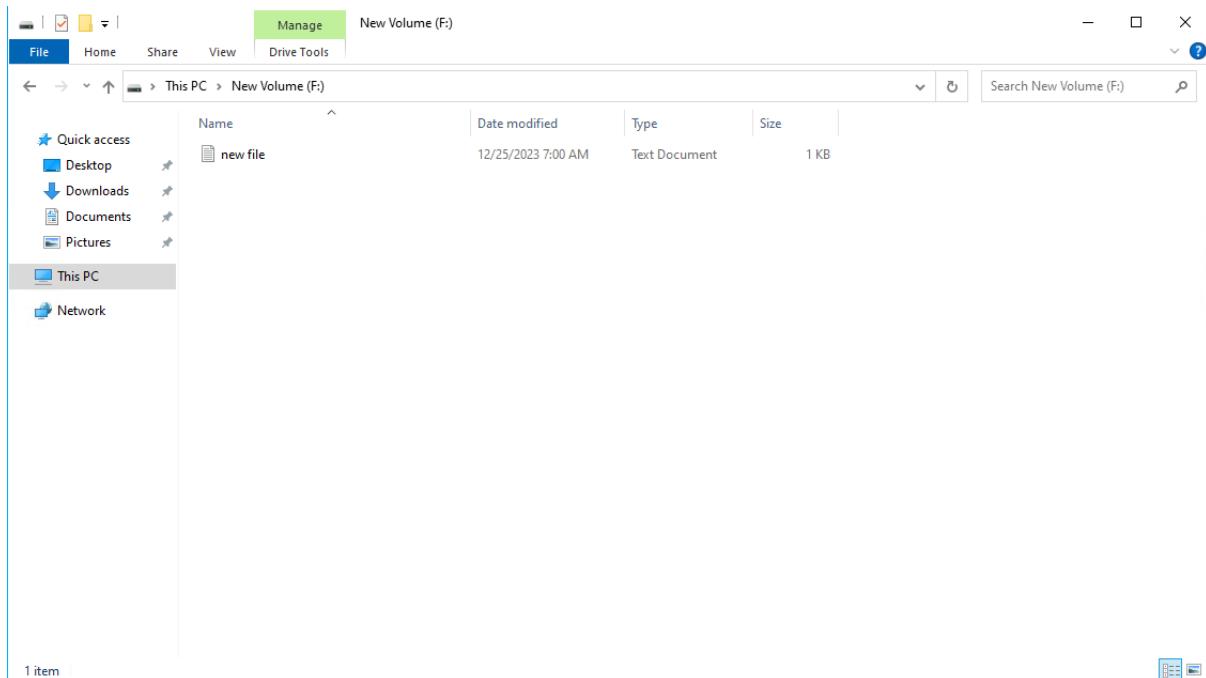
You have successfully completed the New Volume Wizard.



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.

A screenshot of the Azure portal showing the "Disks" blade for a virtual machine named "WindowsVm". The left sidebar includes "Overview", "Activity log", "Access control (IAM)", "Tags", "Diagnose and solve problems", "Connect" (with "Connect" and "Bastion" options), "Networking" (with "Network settings", "Load balancing", "Application security groups", and "Network manager"), and "Settings" (with "Disks"). The main area shows two disk sections: "OS disk" and "Data disks".

Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput (...)	Encryption	Host caching
WindowsVm_OsDisk_1_754ed5	Premium SSD LRS	127	500	100	SSE with PMK	Read/write

LUN	Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput (...)	Encryption
0	WindowsVm_DataDisk_0	Premium SSD LRS	16	120	25	SSE with PMK

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

**WindowsVm\_DataDisk\_0** X ...

Disk

Search

+ Create VM + Create VM image version + Create snapshot Delete Refresh Give feedback

^ Overview JSON View

^ Essentials

Resource group ([move](#)) : app-grp  
Disk state : Attached  
Location : Central India  
Subscription ([move](#)) : [Free Trial](#)  
Subscription ID : 9acc69d-f5ab-4d7e-9feb-ac0e3ea4372f  
Time created : 12/25/2023, 12:11:01 PM

Disk size : 16 GiB  
Storage type : Premium SSD LRS  
Managed by : [WindowsVm](#)  
Operating system : ---  
Completion percent : 100  
Max shares : 0  
Availability zone : No infrastructure redundancy required  
Performance tier : P3 - 120 IOPS, 25 MB/s  
Security type : Standard

Tags ([edit](#)) : [Add tags](#)

Show data for last: 1 hour 6 hours 12 hours 1 day 7 days

^ Activity log  
^ Access control (IAM)  
^ Tags  
^ Diagnose and solve problems

^ Settings

Configuration  
Size + performance  
Encryption  
Networking

^ Disk Export

^ Properties

^ Locks

^ Monitoring

Metrics

^ Automation

CLI / PS  
Tasks (preview)  
Export template

^ Help

Support + Troubleshooting

**Disk Bytes/sec (Throughput)**

Data Disk Read Bytes... windowsvm **1.32 kB/s**  
Data Disk Write Bytes... windowsvm **48.52 kB/s**

**Disk Operations/sec (IOPS)**

Data Disk Read Oper... windowsvm **0.19/s**  
Data Disk Write Oper... windowsvm **0.15/s**

4. Now click on create snapshot.

+ Create VM + Create VM image version + Create snapshot Delete Refresh Give feedback

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

## Create snapshot

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription \* ⓘ  ▼

Resource group \* ⓘ  ▼  
[Create new](#)

**Instance details**

Name \*  ✓

Region ⓘ  ▼

Snapshot type \* ⓘ  Full - make a complete read-only copy of the selected disk.  
 Incremental - save on storage costs by making a partial copy of the disk based on the difference between the last snapshot.

Source type ⓘ  ▼

Source subscription ⓘ  ▼

Source disk ⓘ  ▼

Security type ⓘ  ▼

VM generation ⓘ  Generation 1  
 Generation 2

VM architecture ⓘ  x64  
 Arm64

Storage type \* ⓘ  ▼

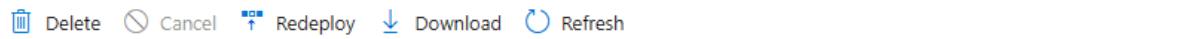
6. On the networking, click on enable public access from all networks.

Basics   Encryption   **Networking**   Advanced   Tags   Review + create

Enable access to your snapshot either publicly using public IP addresses or privately using private endpoints.

- Network access ⓘ  Enable public access from all networks  
 Disable public access and enable private access  
 Disable public and private access
- ⓘ** Enabling public access from all networks might make this resource available publicly. Unless public access is required, we recommend using a more restricted access type. [Learn more ↗](#)

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



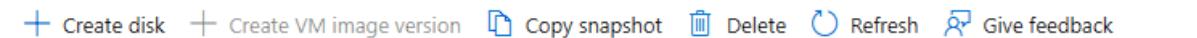
## 8. Once the deployment is complete go back to the resources.

A screenshot of the Azure portal showing the properties of a snapshot named "newsnapshot". The "Properties" tab is selected. Key details shown include: Name: newsnapshot, Snapshot type: Full, VM generation: Gen 1, Completion percent: 100, VM architecture: x64, Provisioning state: Succeeded, Size: 16 GiB, Storage type: Zone-redundant, Encryption type: Platform-managed key, Security type: Standard, and Networking: Public endpoints (AllowAll). On the left, a sidebar lists other options like Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Settings, Properties, Locks, Automation, CLI / PS, Tasks (preview), Export template, Help, and Support + Troubleshooting.

## 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.

## Create a managed disk

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription \* ⓘ

Resource group \* ⓘ  [Create new](#)

**Disk details**

Disk name \* ⓘ  ✓

Region ⓘ  ✓

Availability zone  ✓

Source type ⓘ  ✓

Source subscription ⓘ  ✓

Source snapshot ⓘ

OS type ⓘ  None (data disk)  
 Linux  
 Windows

Security type ⓘ  ✓

VM architecture ⓘ  x64  
 Arm64

Size \* ⓘ **16 GiB**  
Premium SSD LRS  
[Change size](#)

[Review + create](#)

< Previous

Next : Encryption >

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

### ✓ Your deployment is complete

 Deployment name : Microsoft.ManagedDisk-20231225124356 Start time : 12/25/2023, 12:46:10 PM  
Subscription : Free Trial Correlation ID : bcf6e846-9520-4dfc-8d58-8d5ee351e6ce  
Resource group : app-grp

› Deployment details

✗ Next steps

[Go to resource](#)

## 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.

#### Data disks for newvm

You can add and configure additional data disks for your virtual machine or attach existing disks. This VM also comes with a temporary disk.

LUN	Name	Size (GiB)	Disk type	Host caching	Delete with VM
0	Select an existing ...			None	<input type="checkbox"/>

[Create and attach a new disk](#)    [Attach an existing disk](#)

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

#### Data disks for newvm

You can add and configure additional data disks for your virtual machine or attach existing disks. This VM also comes with a temporary disk.

LUN	Name	Size (GiB)	Disk type	Host caching	Delete with VM
0	newsnapshotdisk	16	Premium SSD LRS	Read-only	<input type="checkbox"/>

[Create and attach a new disk](#)    [Attach an existing disk](#)

5. Now create your new virtual machine.

#### Your deployment is complete

 Deployment name: CreateVm-MicrosoftWindowsServer.WindowsSe... Start time: 12/25/2023, 12:54:29 PM  
 Subscription: Free Trial Correlation ID: 8e51357b-1bc9-4c7f-b4a6-e210b35fd218 

 Deployment details

 Next steps

[Setup auto-shutdown](#) Recommended

[Monitor VM health, performance and network dependencies](#) Recommended

[Run a script inside the virtual machine](#) Recommended

[Go to resource](#)

[Create another VM](#)

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

 newvm | Connect

Virtual machine

Search

Refresh Troubleshoot More Options Feedback

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Connect

Connect

Bastion

Windows Admin Center

Networking

Network settings

Load balancing

Application security groups

Network manager

Settings

Disks

Connecting using  
Public IP address | 20.198.1.134

Admin username : demouser

Port (change) : 3389 Check access ⓘ

Just-in-time policy : Unsupported by plan ⓘ

Most common

Native RDP

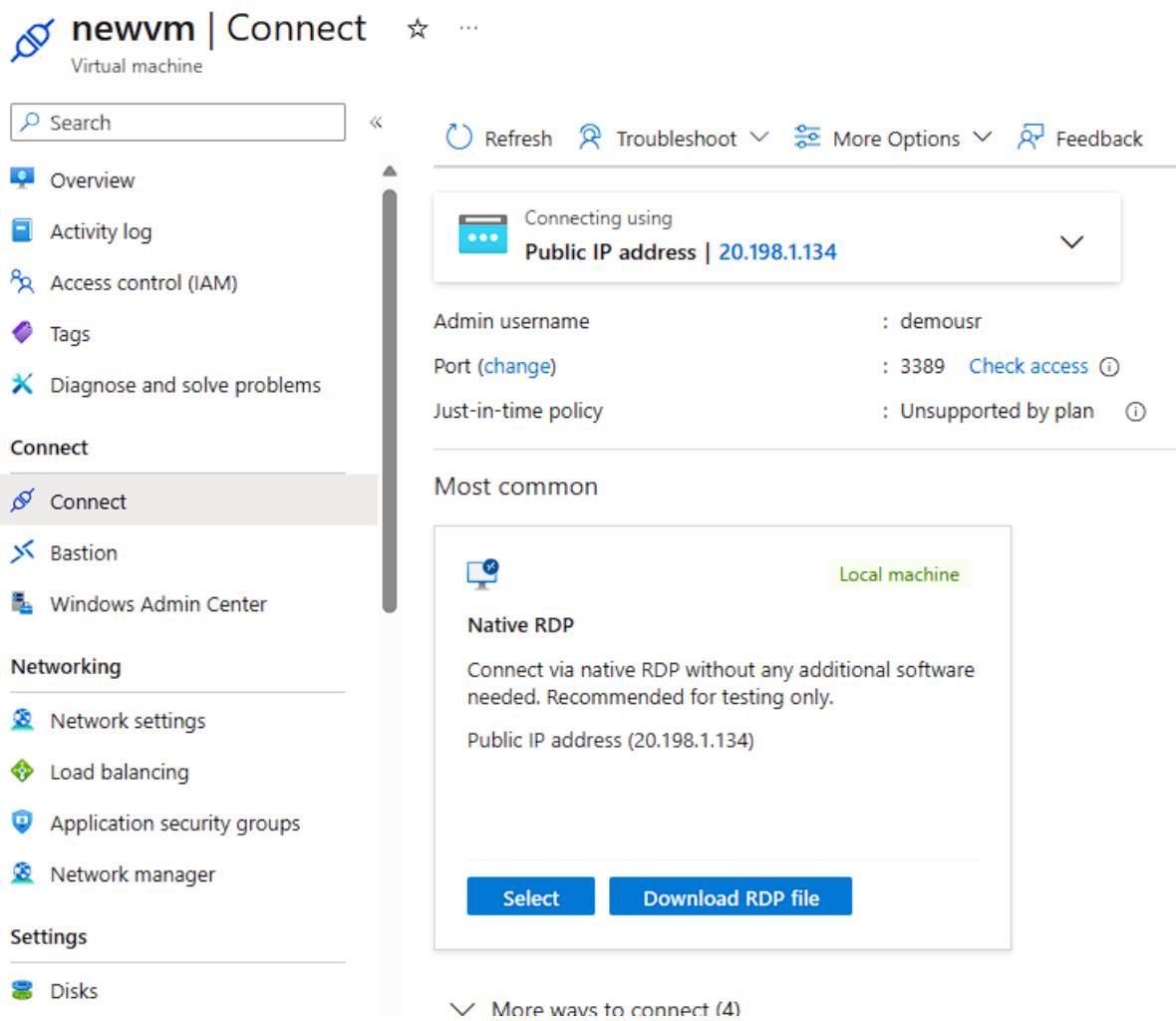
Local machine

Connect via native RDP without any additional software needed. Recommended for testing only.

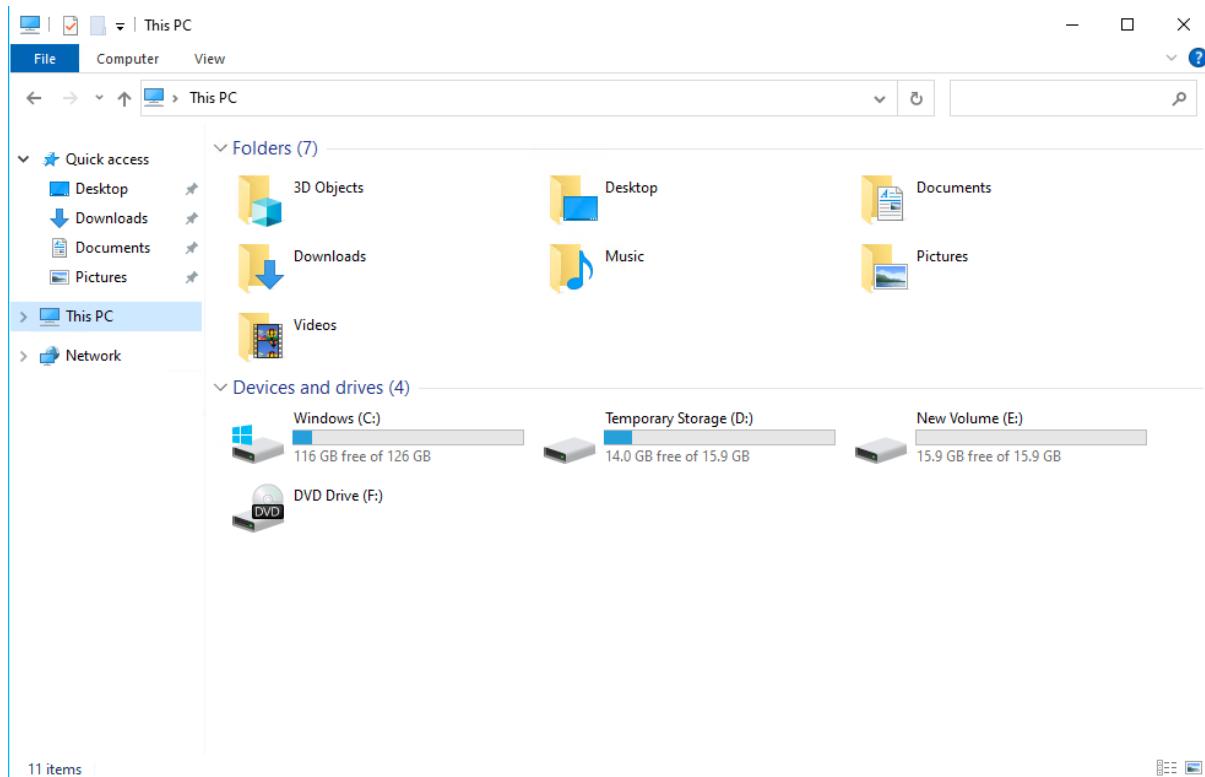
Public IP address (20.198.1.134)

Select Download RDP file

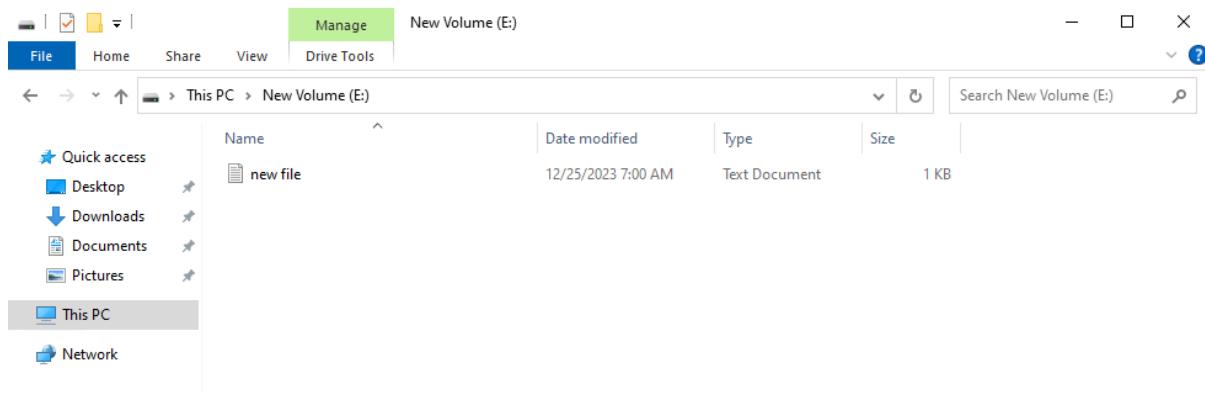
More ways to connect (4)



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 your document here.



## STEP 6: DELETE ALL THE RESOURCES WITH THE DISKS.

All resources

Default Directory (pulkitkumar2711@gmail.commicrosoft.com)

+ Create Manage view Refresh Export to CSV Open query Assign tags Delete

Filter for any field... Subscription equals all Resource group equals all Type equals all Location equals all Add filter

Name	Type	Resource group	Location	Subscription
appvault2711	Key vault	app-grp	Central India	Free Trial
NetworkWatcher_centralindia	Network Watcher	NetworkWatcherRG	Central India	Free Trial
newsnapshot	Snapshot	app-grp	Central India	Free Trial
newsnapshotdisk	Disk	app-grp	Central India	Free Trial
newvm	Virtual machine	app-grp	Central India	Free Trial
newvm-ip	Public IP address	app-grp	Central India	Free Trial
newvm-rsg	Network security group	app-grp	Central India	Free Trial
newvm125	Network Interface	app-grp	Central India	Free Trial
newvm_OsDisk_1_ef5101ef204d45fa9aa530edc531788	Disk	APP-GRP	Central India	Free Trial
WindowsVm	Virtual machine	app-grp	Central India	Free Trial
WindowsVm-ip	Public IP address	app-grp	Central India	Free Trial
WindowsVm-nsg	Network security group	app-grp	Central India	Free Trial
WindowsVm-vnet	Virtual network	app-grp	Central India	Free Trial
windowsvm833	Network Interface	app-grp	Central India	Free Trial
WindowsVm_DataDisk_0	Disk	app-grp	Central India	Free Trial
WindowsVm_OsDisk_1_754ed5aab87548ea9db5321c48affcc0	Disk	APP-GRP	Central India	Free Trial