Module 4: Part 1
Provisioning Storage and Accessing Data

Exercise 1: Connect NAS Clients

In this exercise, you verify that you can connect an NFS and a CIFS/SMB client to your Cloud Volumes ONTAP system and write data.
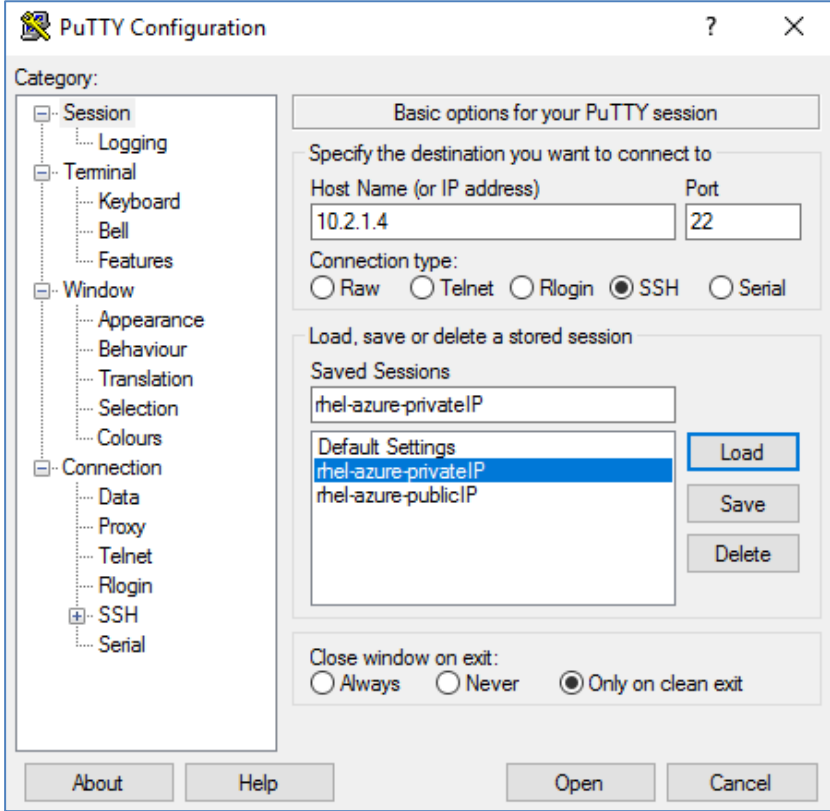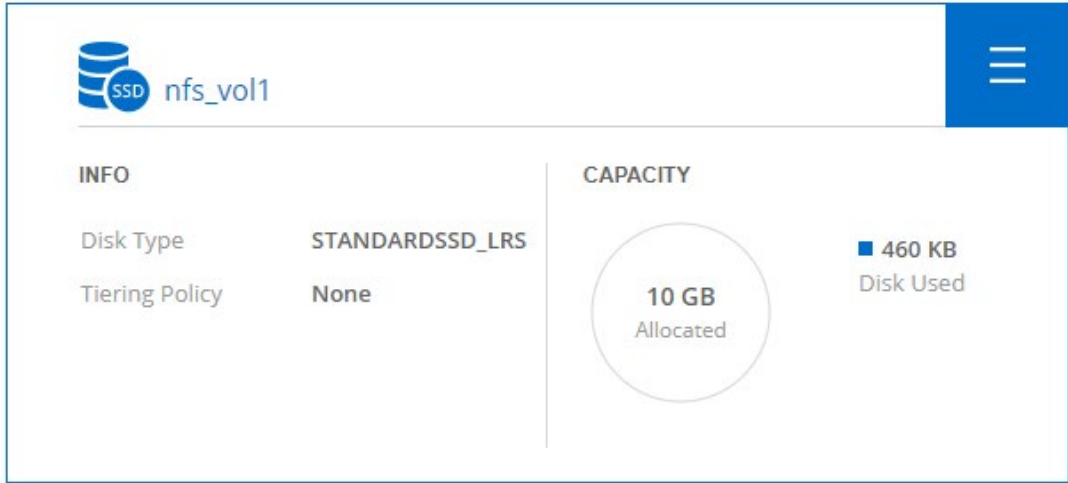
Objectives

This exercise focuses on enabling you to do the following:

- Connect an NFS client to Cloud Volumes ONTAP and write data.
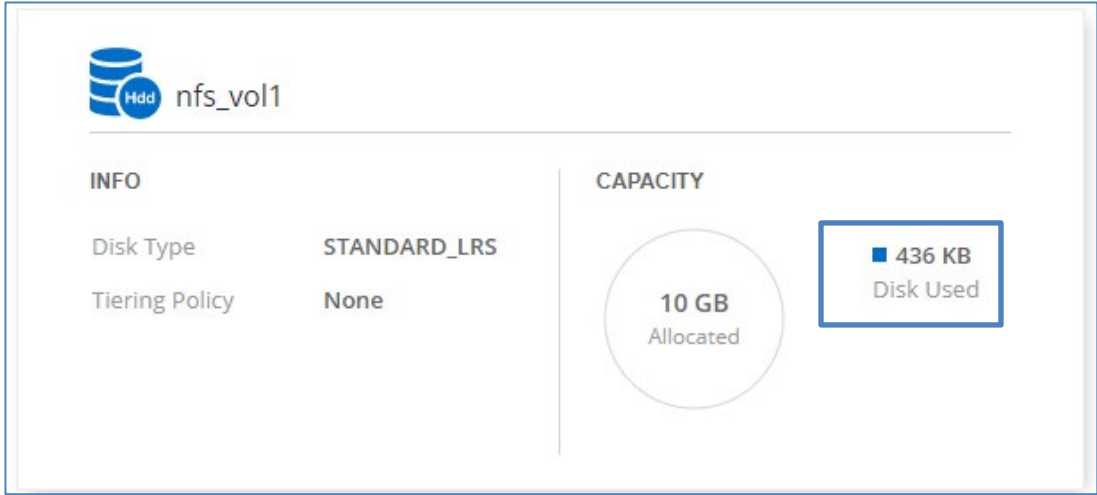- Connect an SMB (CIFS) client to Cloud Volumes ONTAP and write data.

Task 1: Connect an NFS Client

Step	Action
1-1	Open a Remote Desktop Protocol (RDP) session to the W2K16-JumpHost virtual machine. (Reminder how to connect: Azure Portal > Virtual Machines > W2K16-JumpHost > Connect > RDP > Download RDP File)
1-2	Enter your credentials: User name: **DemoAdmin** Password: **HappyCloud123**

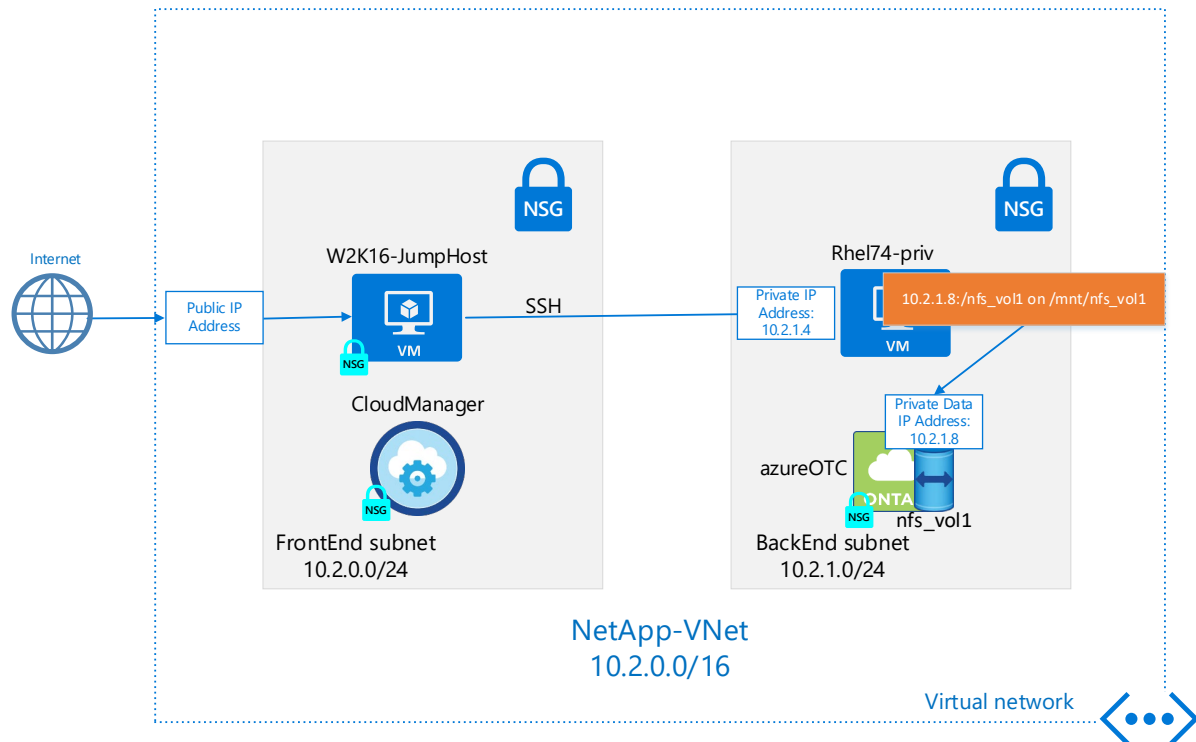| Step	Action
1-3	Connect to the Linux client using PuTTY (or another Secure Shell [SSH] tool):
1-4	Enter your credentials: Log in as: **demoadmin** Password: **HappyCloud123**

1-5	Install and start NFS service on the client:
	
	    a. `[demoadmin@rhel74priv]:`**`sudo yum install nfs-utils libnfsidmap`**
	
	        `Total download size: 1.0 M`
	
	        `Installed size: 2.6 M`
	
	        `Is this ok [y/d/N]:` **`y`**
	
	    b. `[demoadmin@rhel74priv]:` **`sudo systemctl start nfs`**

Step	Action
1-6	Verify that NFS service is running: `[demoadmin@rhel74priv ~]:` **`sudo systemctl status nfs`** Example output: ● nfs-server.service - NFS server and services 　Loaded: loaded (/usr/lib/systemd/system/nfs-server.service; disabled; vendor preset: disabled) 　Active: active (exited) since Fri 2018-05-11 14:54:53 UTC; 1min 19s ago 　Process: 1395 ExecStart=/usr/sbin/rpc.nfsd $RPCNFSDARGS (code=exited, status=0/SUCCESS) 　Process: 1390 ExecStartPre=/bin/sh -c /bin/kill -HUP `cat /run/gssproxy.pid` (code=exited, status=0/SUCCESS) 　Process: 1388 ExecStartPre=/usr/sbin/exportfs -r (code=exited, status=0/SUCCESS) 　Main PID: 1395 (code=exited, status=0/SUCCESS) 　CGroup: /system.slice/nfs-server.service May 11 14:54:53 rhel74priv systemd[1]: Starting NFS server and services... May 11 14:54:53 rhel74priv systemd[1]: Started NFS server and services.
1-7	Create a directory for the NFS mount: [demoadmin@rhel74priv ~]$ **sudo mkdir /mnt/nfs_vol1**
1-8	Return to the Cloud Manager web browser tab.
1-9	Click the menu icon for nfs_vol1 volume.

Step	Action
1-10	Click **Mount Command**. nfs_vol1 ⓘ Info ✏ Edit 🗑 Delete ✕ 📋 Clone ↗ Mount Command ↺ Restore from Snapshot copy ☁ Change Tier 📷 Create a Snapshot copy
1-11	Click **Copy**. ↩ Mount Volume nfs_vol1 Go to your Linux machine and enter this mount command `mount 10.2.1.8:/nfs_vol1 <dest_dir>` 📋 Copy
1-12	Return to the SSH session and right-click to paste the command: a. Add **sudo** to the beginning of the command. b. Replace <dest_dir> with **/mnt/nfs_vol1** c. Press **Enter**. Example command: `[demoadmin@rhel74priv ~]$ sudo mount 10.2.1.8:/nfs_vol1 /mnt/nfs_vol1` `[sudo] password for demoadmin: `**`HappyCloud123`**
1-13	Enter the command: `[demoadmin@rhel74priv ~]$ `**`cd /mnt/nfs_vol1`**
1-14	Write data to the volume: `[demoadmin@rhel74priv nfs_vol1]$` **`curl https://cvoadminazure.s3.amazonaws.com/DR-templates/500M.test > 500m.test`**

```
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100   243    0   243    0     0    583      0 --:--:-- --:--:-- --:--:--   582
```

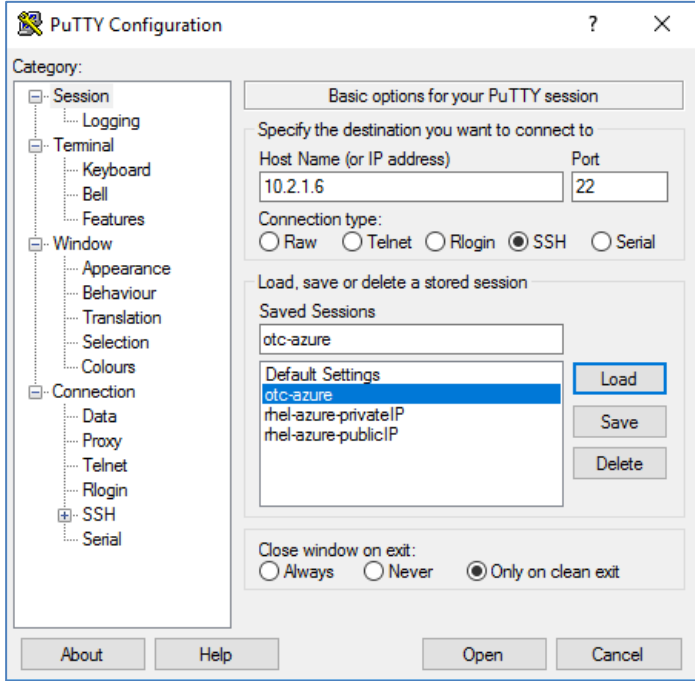| Step	Action

1-15	List files in the directory:
	
	`[demoadmin@rhel74priv nfs_vol1]$ ll -h`
	
	`total 4.0K`
	
	`-rw-rw-r--. 1 demoadmin demoadmin 243 Apr 29 13:04 500m.test`

1-16	Return to Cloud Manager and verify that storage is being used on the volume:

Azure Diagram

The figure shows the configuration of the Azure network after you complete Task 1: Connect an NFS Client.

Task 2: Configure an SMB Workgroup on Cloud Volumes ONTAP

In this task, you use the ONTAP CLI to configure an SMB workgroup and an SMB share.

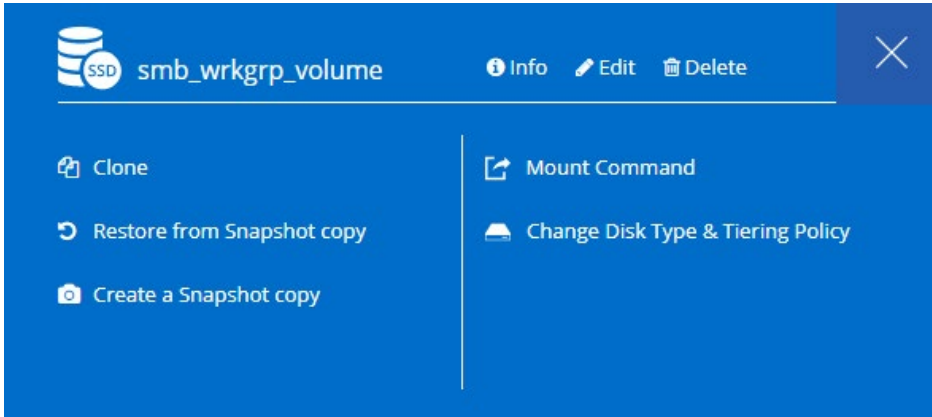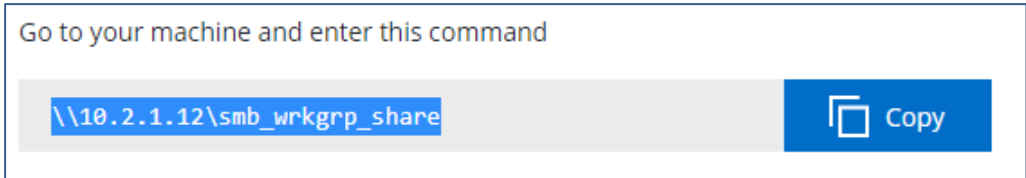| Step	Action
2-1	On the jump host, open the PuTTY (or another SSH) tool.
2-2	For the Host Name, enter the IP address of the ONTAP cluster-mgmt IP address, and in the Saved Sessions, enter **otc-azure**.
2-3	Click **Save**.
2-4	Click **Open**.
2-5	Enter the following credentials: • Log in as: **admin** • Password: **HappyCloud123**

2-6	Verify that the CIFS protocols are configured for the `svm_azureCVO` storage virtual machine (SVM):
	
	`azureCVO::> ` **`vserver show-protocols -vserver svm_azureCVO`**
	
	Sample output:
	
	`  Vserver: svm_azureCVO`
	
	`Protocols: nfs, ` `cifs` `, iscsi`
	
	Note: The CLI refers to SVMs as Vservers (an old name).

Step	Action

2-7	Create a CIFS server on `svm_azureCVO`:
	
	`azureCVO::>` **`vserver cifs create -vserver svm_azureCVO -cifs-server`**
	`SMBWRKGRP -workgroup WORKGROUP`
	
	Sample output:
	
	`Info: SMB1 protocol version is disabled on this CIFS server. If`
	`required, use the (privilege: advanced) command "vserver cifs options`
	`modify -vserver svm_azureCVO -smb1-enabled true" to enable it.`

2-8	Verify that the CIFS server was created and that the authentication style is workgroup:
	
	`azureCVO::>` **`vserver cifs show`**
	
	Sample output:
	
	`              Server          Status    Domain/Workgroup Authentication`
	`Vserver       Name            Admin     Name             Style`
	`-----------   ---------------  ---------  ----------------  --------------`
	`svm_azureCVO`
	`              SMBWRKGRP       up        WORKGROUP        workgroup`

2-9	Create a 5GB volume to serve the SMB workgroup: `azureCVO::>` **`volume create -volume smb_wrkgrp_volume -aggregate aggr1 -`** **`size 5GB -vserver svm_azureCVO -junction-path /smb_wrkgrp_volume -`** **`security-style ntfs -space-guarantee none`** Sample output: `[Job 76] Job succeeded: Successful`
2-10	Turn on volume efficiency: `azureCVO::>` **`volume efficiency on -vserver svm_azureCVO -volume`** **`smb_wrkgrp_volume`**
2-11	You use ONTAP CLI instead of Cloud Manager to create the volume and the corresponding share because you need to set up this unique SMB workgroup authentication instead of a normal Active Directory domain controller. You are not using Cloud Manager, which automatically sets the proper storage efficiency features on the volume during creation. Therefore, you have to make sure to set the `-space-guarantee none` (thin provisioning) and `volume efficiency on` (enable deduplication).
2-12	Create an SMB share for the new volume: `azureCVO::>` **`cifs share create -vserver svm_azureCVO -share-name`** **`smb_wrkgrp_share -path /smb_wrkgrp_volume`**

Step	Action
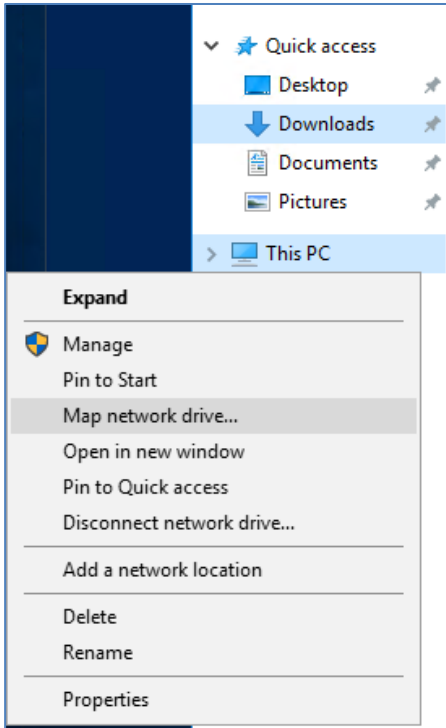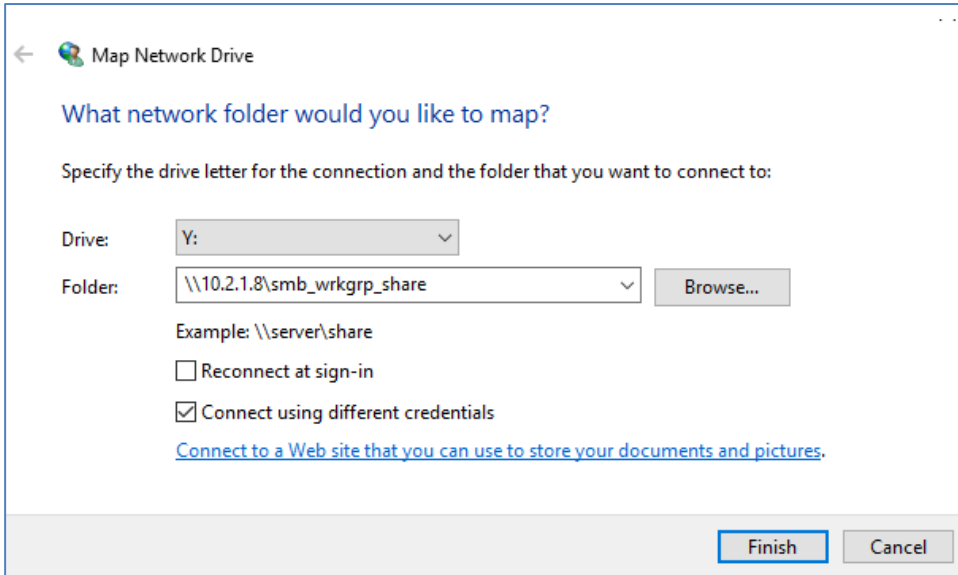| 2-13	Verify that the share was created: `azureCVO::> `**`cifs share show -vserver svm_azureCVO -share-name`** **`smb_wrkgrp_share`** <pre> Vserver: svm_azureCVO
Share: smb_wrkgrp_share
CIFS Server NetBIOS Name: SMBWRKGRP
Path: /smb_wrkgrp_volume
Share Properties: oplocks
browsable
changenotify
show-previous-versions
Symlink Properties: symlinks
File Mode Creation Mask: -
Directory Mode Creation Mask: -
Share Comment: -
Share ACL: Everyone / Full Control
File Attribute Cache Lifetime: -
Volume Name: smb_wrkgrp_volume
Offline Files: manual
Vscan File-Operations Profile: standard
Maximum Tree Connections on Share: 4294967295
UNIX Group for File Create: -</pre>
2-14	Create an SMB workgroup user `wrkgrp_user` (and when you are prompted, enter and confirm the password **HappyCloud123**): `azureCVO::> `**`vserver cifs users-and-groups local-user create -vserver`** **`svm_azureCVO -user-name wrkgrp_user`** Sample output: <pre>Enter the password:
Confirm the password:</pre>
2-15	Verify that the local-user was created: `azureCVO::> `**`vserver cifs users-and-groups local-user show`** <pre>Vserver User Name Full Name Description
------------ -------------------------- -------------------- -------------
svm_azureCVO SMBWRKGRP\Administrator   Built-in
administrator account
svm_azureCVO SMBWRKGRP\wrkgrp_user   -   -
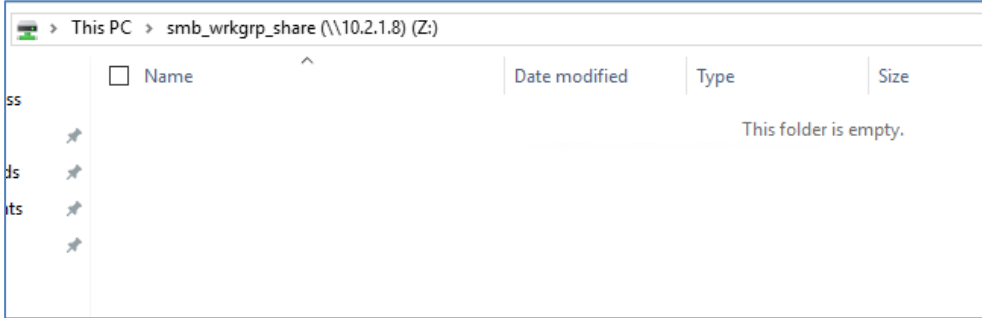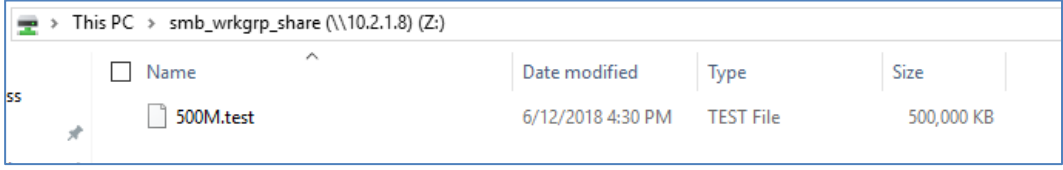2 entries were displayed.</pre>

Step	Action
2-16	Enter the following command and record the IP address of the svm_azure_CVO_data_lif: _____ `azureCVO::>` **`network interface show -role data`**

Task 3: Connect an SMB Client

For this task, you connect the jump host to the Cloud Volumes ONTAP share using local workgroup authentication. You then verify that you can write data to the share.
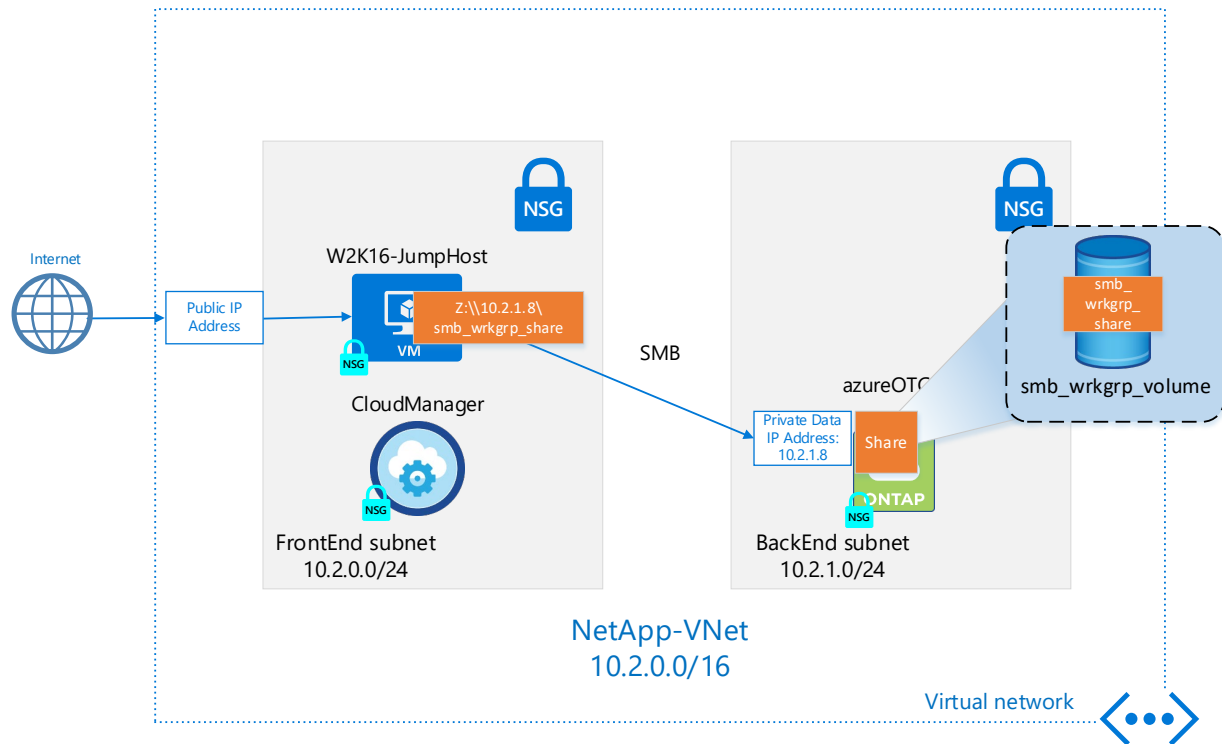
Step	Action
3-1	Return to the Cloud Manager, Volumes tab.
3-2	In the smb_wrkgrp_volume box, select the menu icon, and then click **Mount Command**. ![smb_wrkgrp_volume menu showing Info, Edit, Delete, Clone, Restore from Snapshot copy, Create a Snapshot copy, Mount Command, Change Disk Type & Tiering Policy]
3-3	Click **Copy**. Go to your machine and enter this command `\\10.2.1.12\smb_wrkgrp_share` Copy
3-4	*i* The IP address in this command is the same as the data LIF IP address that you recorded in the previous task.

Step	Action
3-5	On the W2K16-jumphost Windows Server, open File Explorer, right-click **This PC**, and select **Map network drive**.
3-6	Paste the copied text from the previous step.
3-7	Select the **Connect using different credentials** checkbox, and click **Finish**.
3-8	Enter the following network credentials, and click **OK**: User name: **SMBWRKGRP\wrkgrp_user** Password: **HappyCloud123**

Step	Action
3-9	Verify that a File Explorer window opens to the share.
3-10	In the next steps, you copy a file to the drive to make sure that you can store data on it:
	Open a browser tab and enter the URL:
	https://cvoadminazure.s3.amazonaws.com/DR-templates/500M.test
	(This action downloads the file to your browser's downloads folder.)
3-11	Copy the file from the downloads folder to the smb_wrkgrp_share.
3-12	Verify that the file is stored in the share:

Azure Diagram

The figure shows the configuration of the Azure network after you complete Task 3: Connect an SMB Client.

End of Exercise