Module 6: Managing Data Across a Hybrid Cloud

Exercise 2: Implement a Disaster-Recovery Configuration

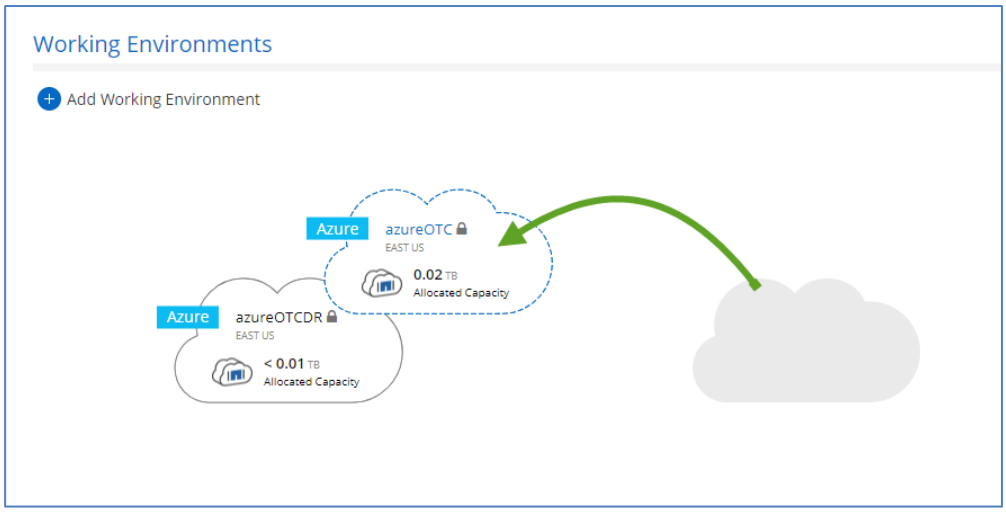
In this exercise, you use Cloud Manager to set up and manage SnapMirror relationships. You also use Cloud Manager to perform a cross-cloud disaster recovery.

Objectives

This exercise focuses on enabling you to do the following:

- Use Cloud Manager to implement cross-cloud SnapMirror relationships
- Perform a disaster recovery
- Reset the original SnapMirror relationship

Task 1: Create a SnapMirror Relationship

Step	Action
1-1	Return to the Cloud Manager interface from the W2K16-JumpHost.
1-2	Drag the primary Cloud Volumes ONTAP system **azureCVO** to the disaster recovery Cloud Volumes ONTAP system azureOTCDR. 

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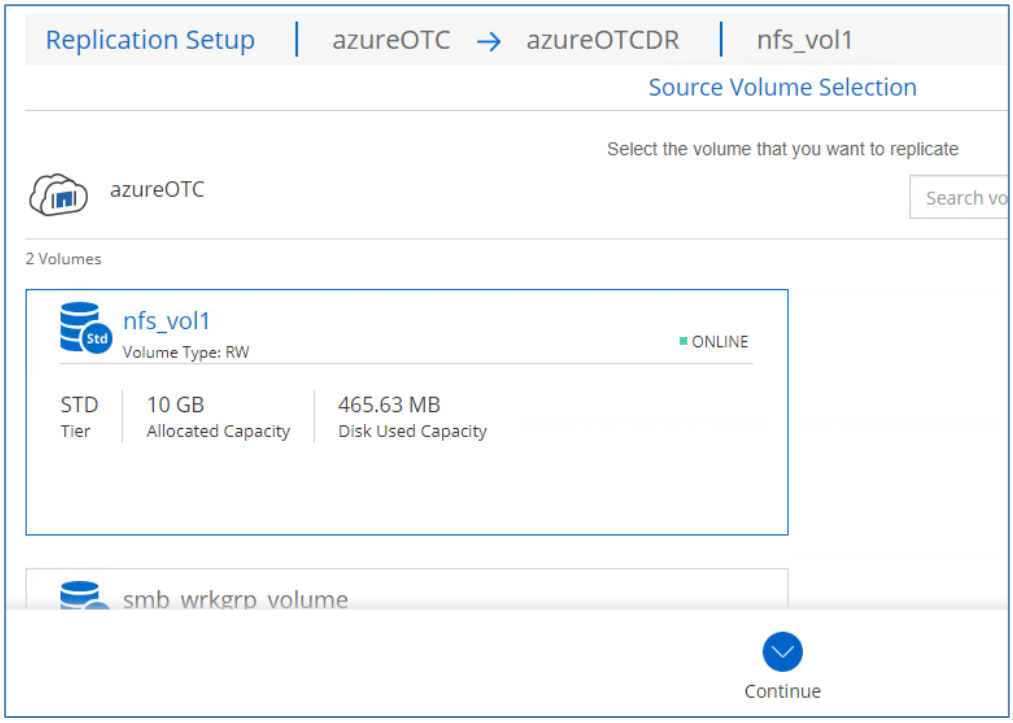
Step	Action
1-3	Select **nfs_vol1**, and then click **Continue**. 

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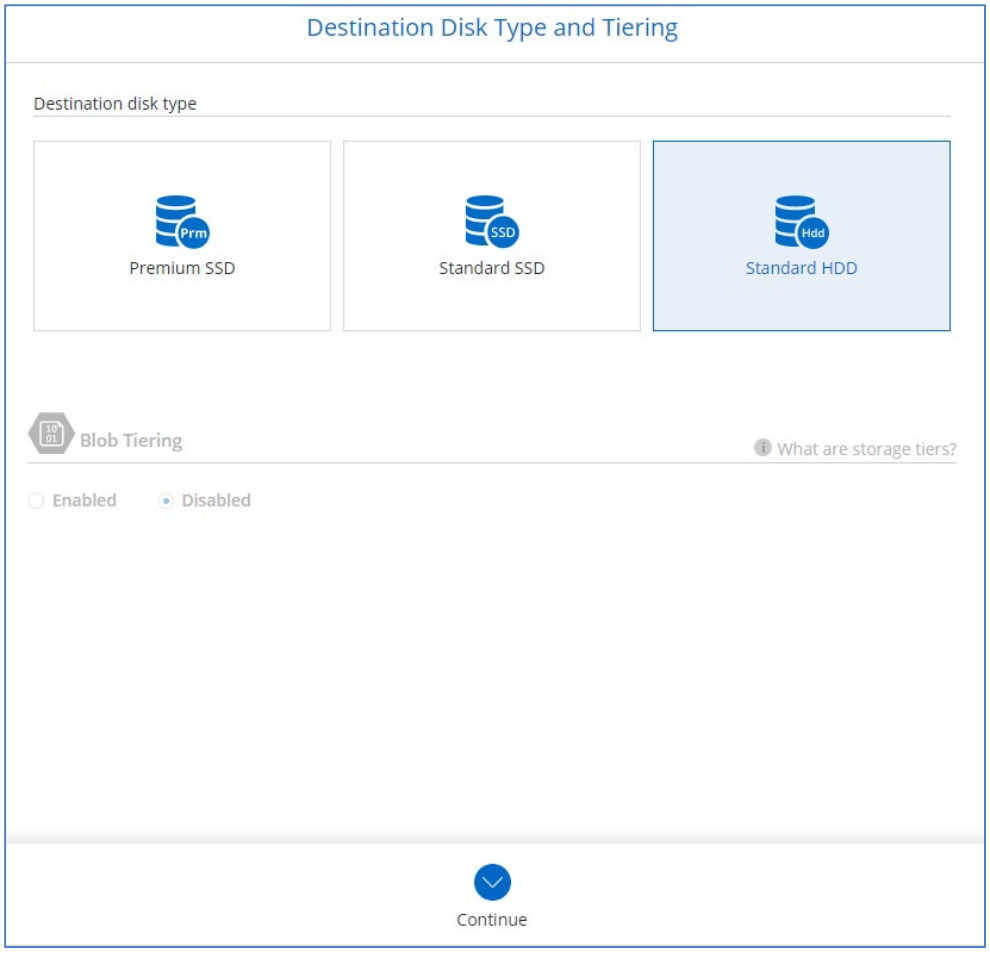
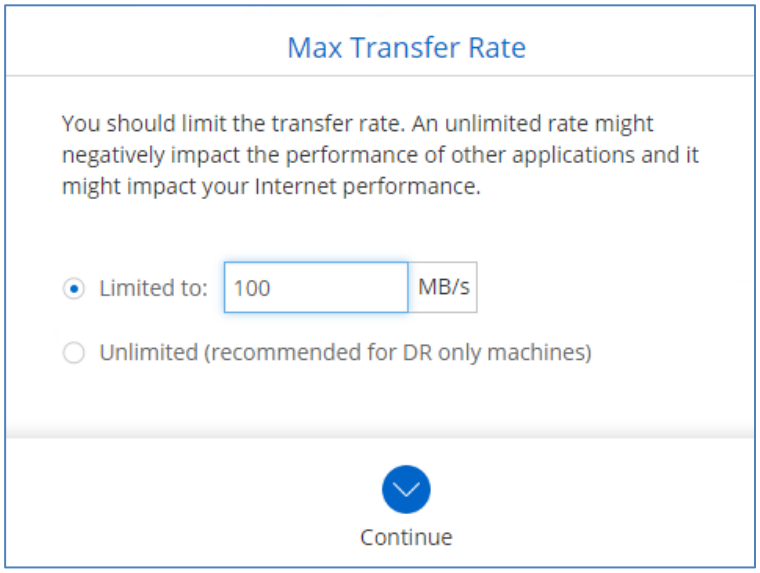
Step	Action
1-4	On the Destination Disk Type and Tiering page, select Standard HDD, and click **Continue**. 
1-5	On the Destination Volume Name, leave the defaults, and click **Continue**.
1-6	On the Max Transfer Rate page, leave the default, and click **Continue**. 

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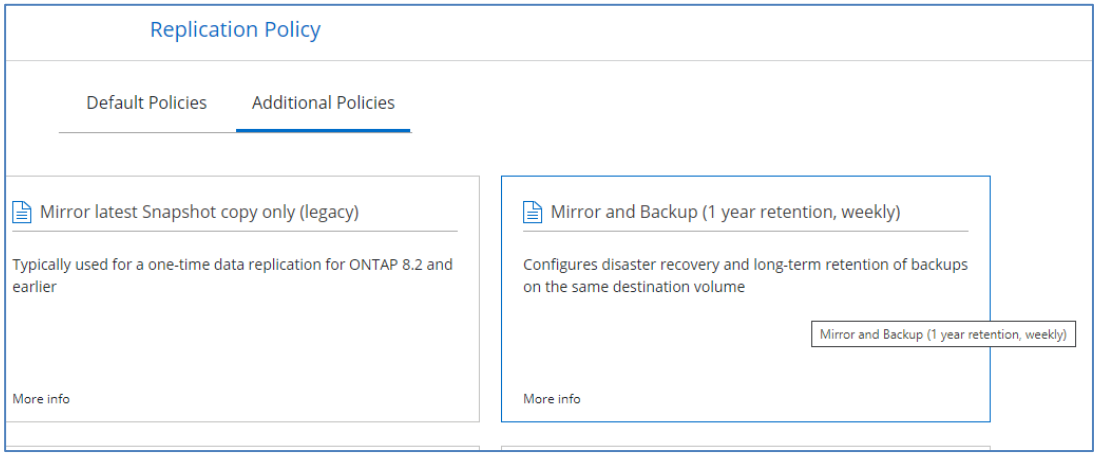
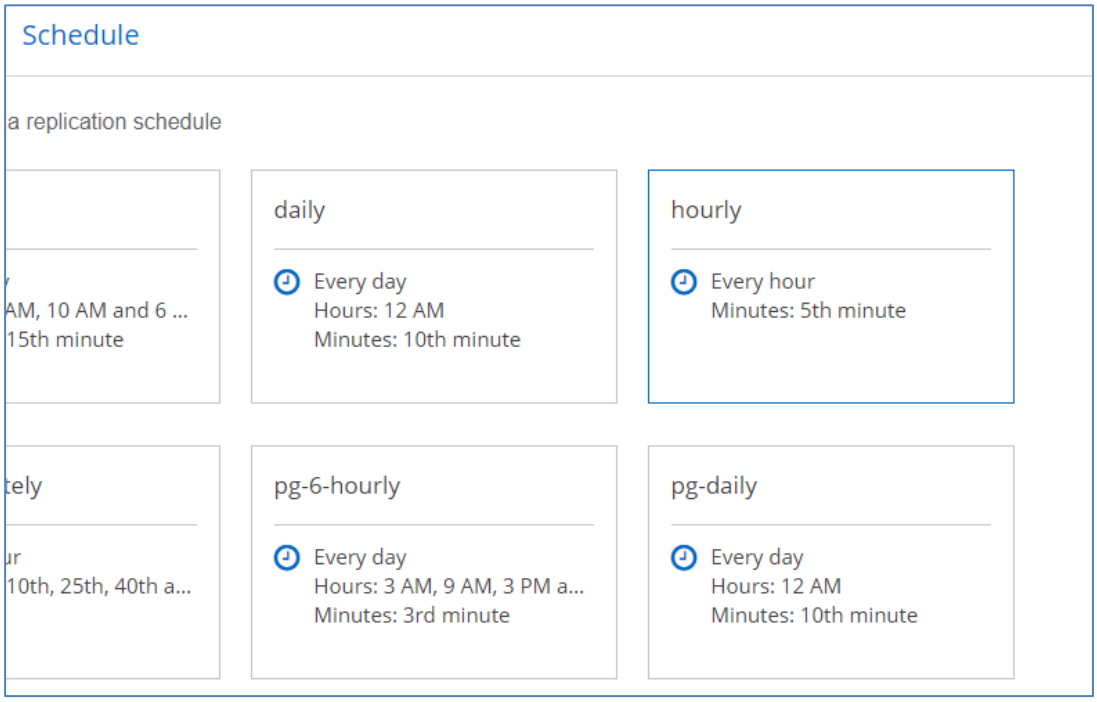
Step	Action
1-7	On the Replication Policy page, click the **Additional Policies** tab.
1-8	Click **Mirror and Backup (1 year retention, weekly)**. 
1-9	On the Schedule page, click **hourly**. 
1-10	On the Review & Approve page, select the **I understand that Cloud Manager will allocate the appropriate resources to comply with my above requirements** checkbox.
1-11	Click **More information >**.

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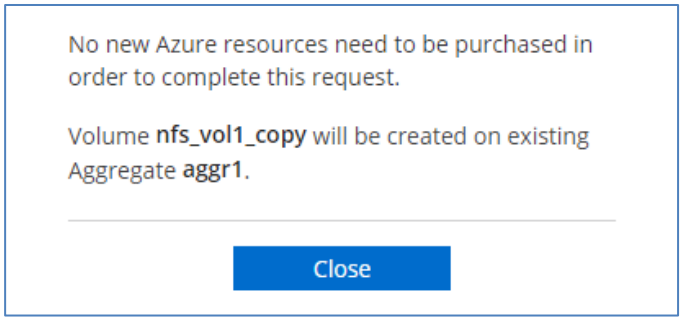
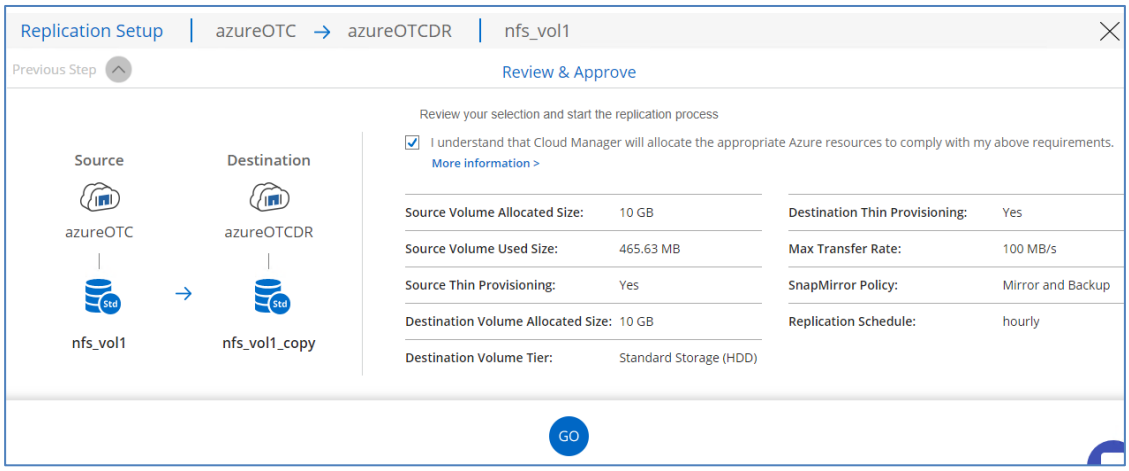
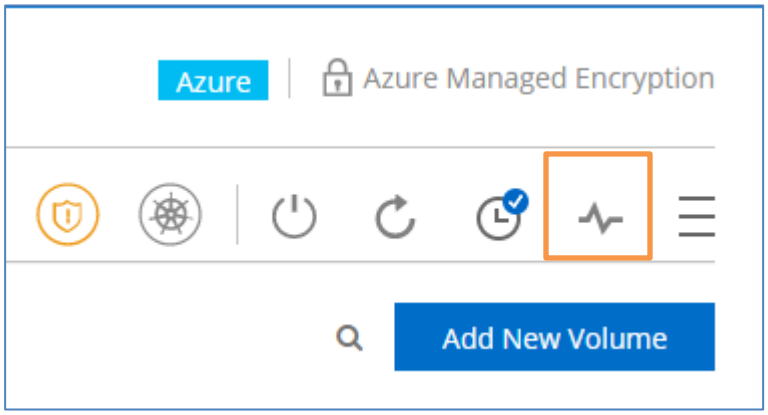
Step	Action
1-12	Read the notification that says that no new Azure resources need to be purchased, and click **Close**. 
1-13	No new Azure resources are needed because you already have an aggregate with Standard disks (aggr1) on the destination Cloud Volumes ONTAP system. However, if in the Destination Volume Name and Tiering step, Premium storage was selected, a new aggregate with solid-state drive (SSD) disks would need to be created. Therefore, new Azure disk resources would be acquired during this process.
1-14	Review all of your information, and click **Go**. 
1-15	Double click on either CVO and click **Timeline** to view the replication progress. 

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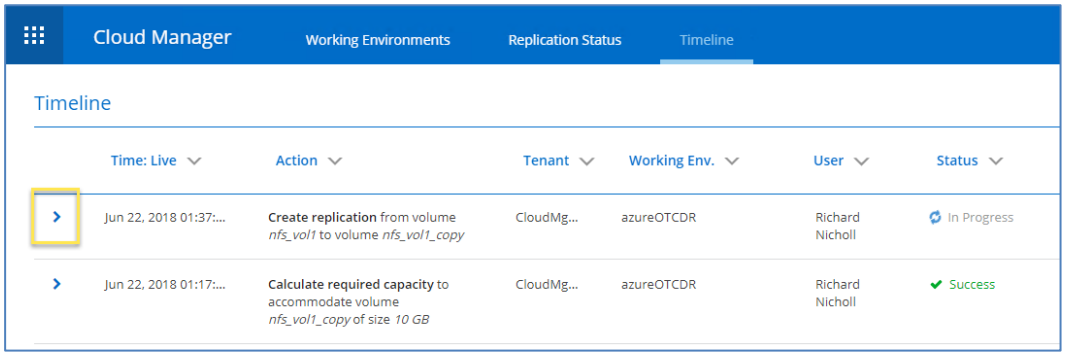
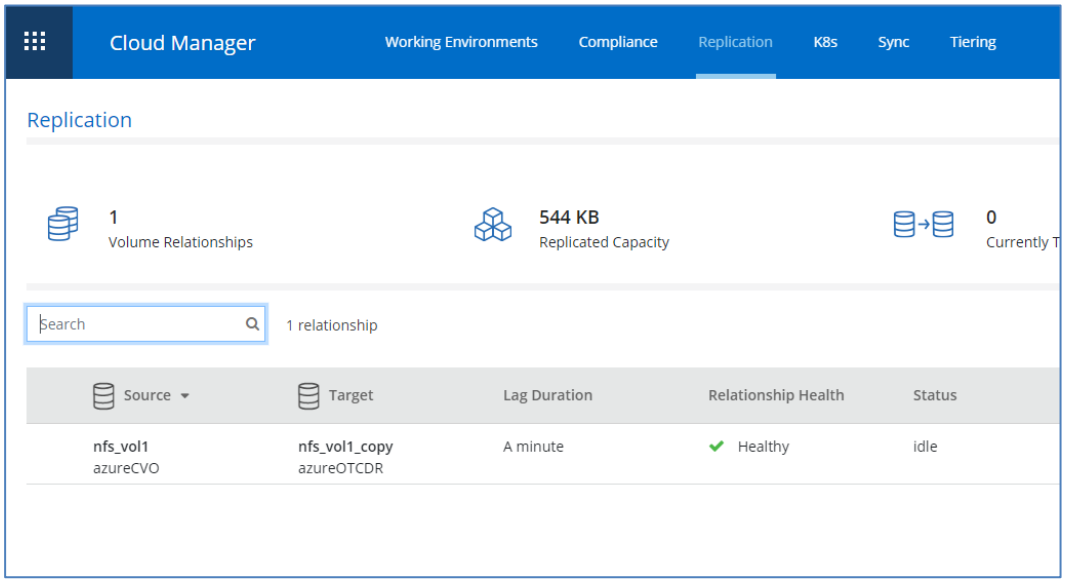
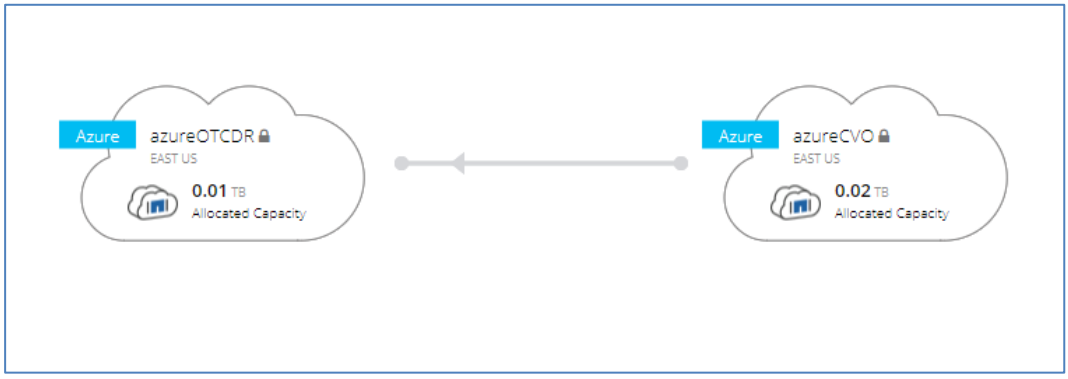
Step	Action
1-16	Click the far-left arrow for the action to view low-level details of a task. 
1-17	Click the **Replication** tab, and then verify that replication finished (Mirror state is snapmirrored). 
1-18	Click the Working Environments tab to view that the SnapMirror relationship is now displayed graphically as an arrow from the azureCVO system to the azureOTCDR system. 

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Task 2: Simulate Disaster Recovery

Step	Action
2-1	Return to the Red Hat Enterprise Linux virtual machine (VM) (reminder: username/password is demoadmin/HappyCloud123).
2-2	Enter the nfs_vol1 directory: `[demoadmin@rhel77priv ~]$` **`cd /mnt/nfs_vol1`**

2-3	Verify that you see the 500m.test file in the directory:
	`[demoadmin@rhel77priv nfs_vol1]$ ll -h`
	`total 491M`
	`-rw-rw-r--. 1 demoadmin demoadmin 489M Apr 30 14:19 500m.test`
	`[demoadmin@rhel77priv nfs_vol1]$`

2-4	Create a new file: `[demoadmin@rhel74priv nfs_vol1]$` **`touch NewFileBeforeDisaster`**

2-5	Verify that the file was created:
	`[demoadmin@rhel77priv nfs_vol1]$ ll -h`
	`total 491M`
	`-rw-rw-r--. 1 demoadmin demoadmin 489M Apr 30 14:19 500m.test`
	`-rw-rw-r--. 1 demoadmin demoadmin  0 Apr 30 14:21 NewFileBeforeDisaster`
	`[demoadmin@rhel77priv nfs_vol1]$`

2-6	Exit from this directory: `[demoadmin@rhel74priv nfs_vol1]$` **`cd ..`**
2-7	Return to Cloud Manger, and click the **Replication Status** tab.

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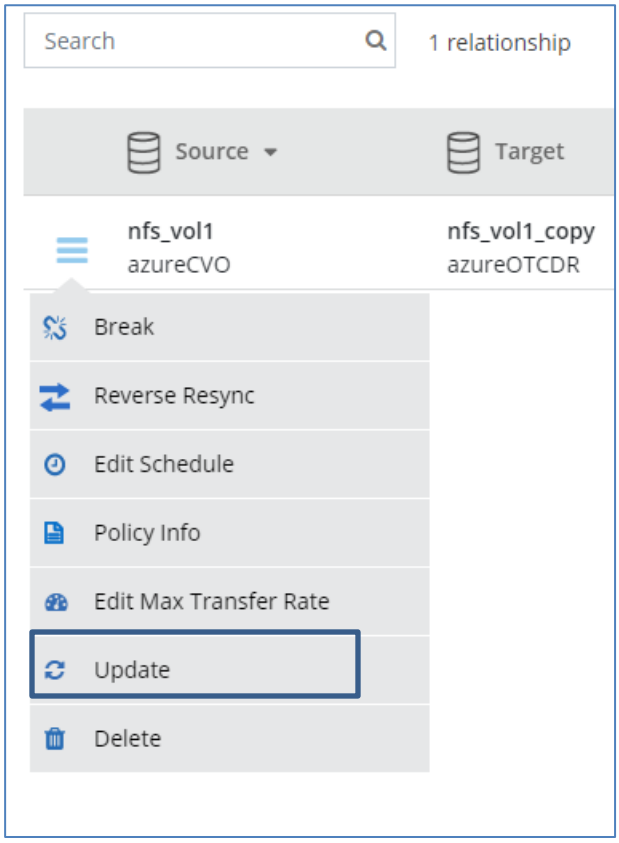
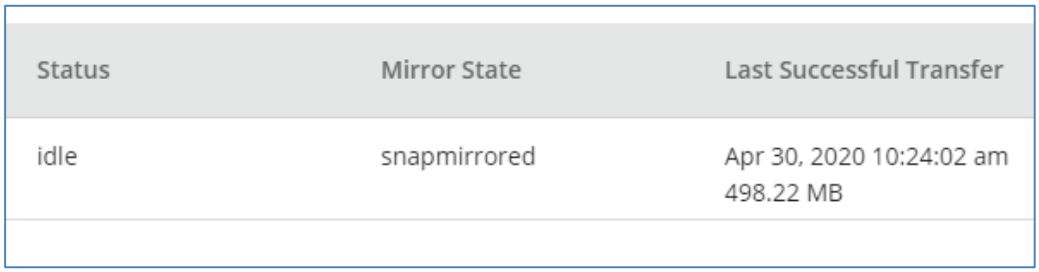
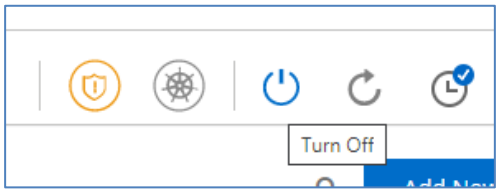
Step	Action
2-8	Click the menu icon, and then select **Update** to perform a manual SnapMirror update. 
2-9	Wait for the Status to be idle and the Mirror State to be snapmirrored. 
2-10	Simulate a disaster recovery: a. Click the **Working Environments** tab. b. Double-click the **azureCVO** system. c.  Click the power icon. d. Click **Turn Off**.
2-11	Click the **Working Environments** tab.

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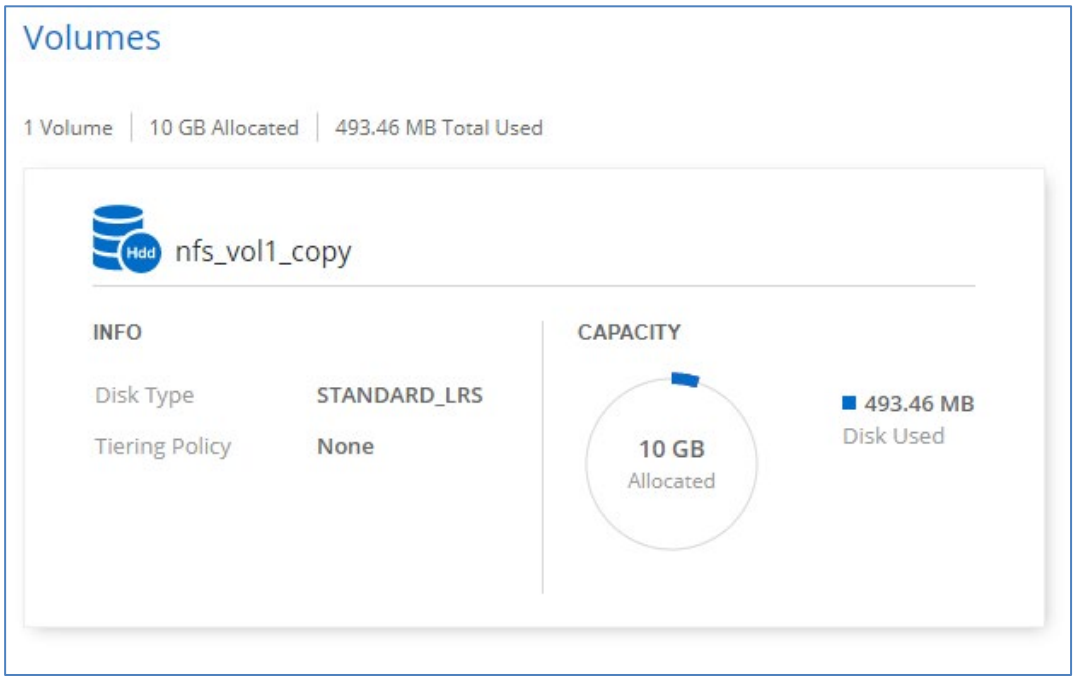
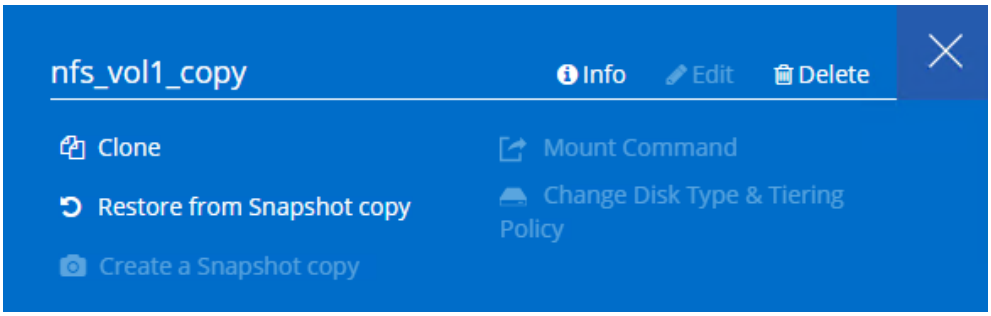
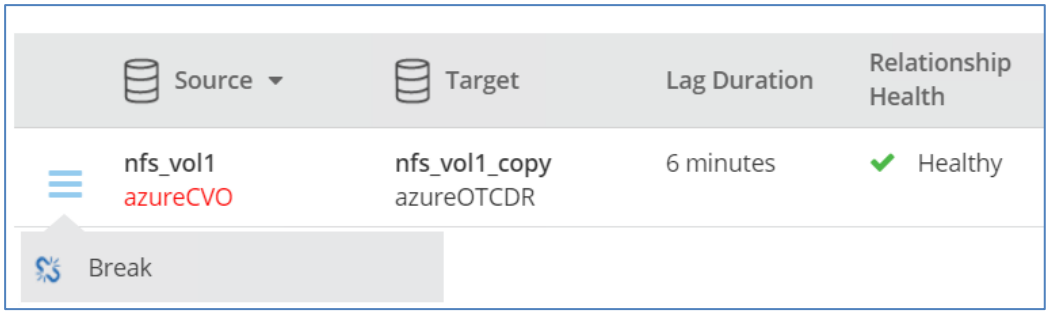
Step	Action
2-12	Wait for the azureCVO system to be in the Turned off state.
2-13	Double-click the **azureOTCDR** system.
2-14	Verify that you see the volume nfs_vol1_copy. 
2-15	Select the **nfs_vol1_copy** menu, and verify that currently the mount command is not available. 
2-16	Return to the Replication Status tab and select the **Break** command. 
2-17	In the Are you sure window, click **OK**.

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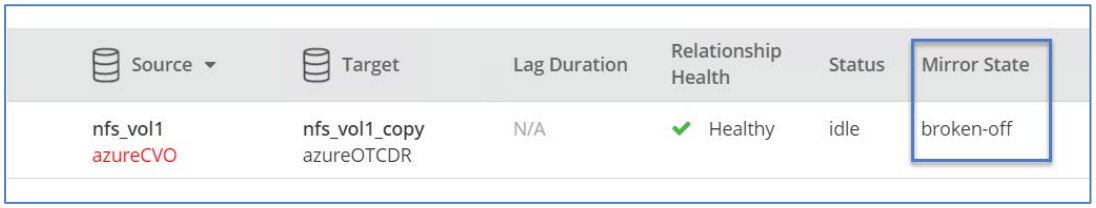
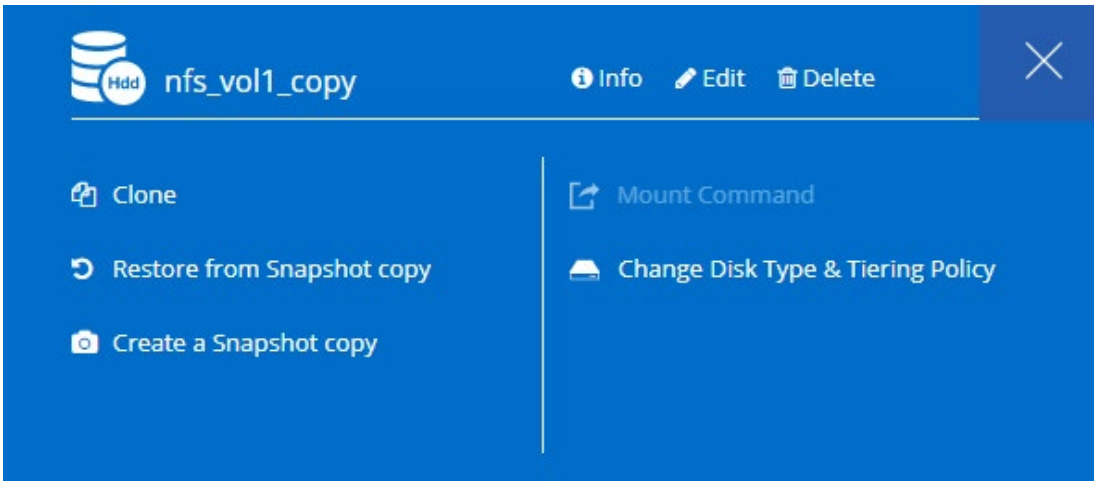
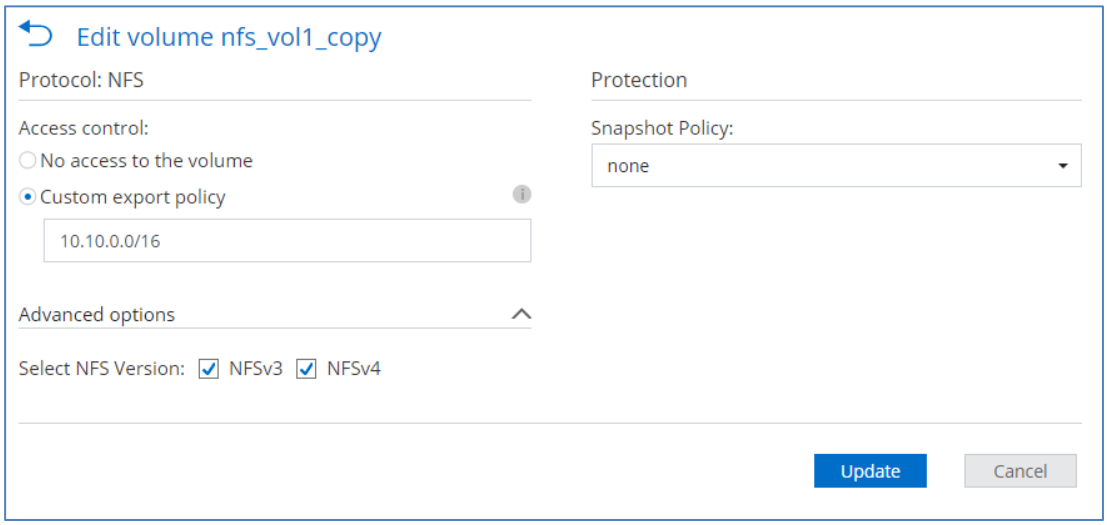
Step	Action
2-18	Verify that the Mirror State is broken-off. 
2-19	Return to the azureOTCDR working environment, and click the **Volumes** tab.
2-20	Select the **nfs_vol1_copy** menu, and then click **Edit**. 
2-21	The Mount Command is still not available because you never set up an export policy.
2-22	Click the **Custom export policy** button, and then click **Update**. 

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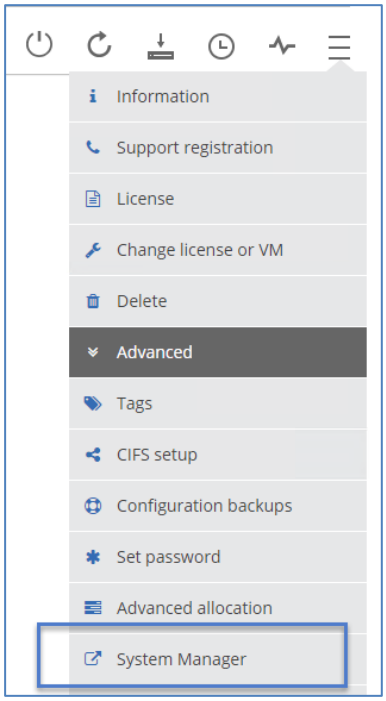
Step	Action
2-23	In a normal scenario in which you have clients in the Azure DR VNet, this export policy rule is sufficient. However, due to cost, time, and simplicity concerns in this lab environment, you are going to reuse the clients in the NetApp VNet. Therefore, you need to create a rule that allows clients to connect from the 10.2.1.0/24 CIDR range. Also, in all cases, you need to mount the disaster recovery volume into the storage virtual machine (SVM) namespace. You do both of these things in System Manager.
2-24	In the working environment, click the menu icon, and then click **Advanced > System Manager**. 
2-25	In the Launch System Manager dialog box, click **Launch**.
2-26	Ignore any security warnings (the appearance is different, depending on the browser that you are using).

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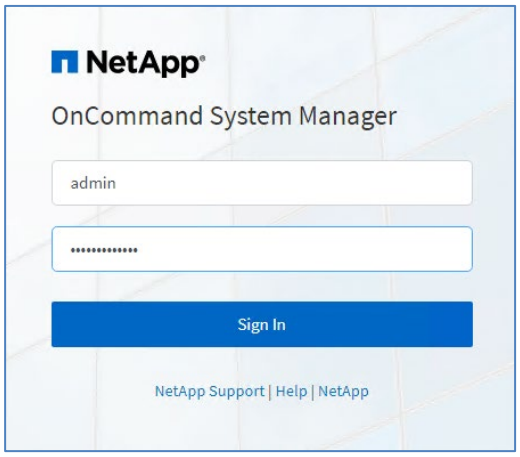
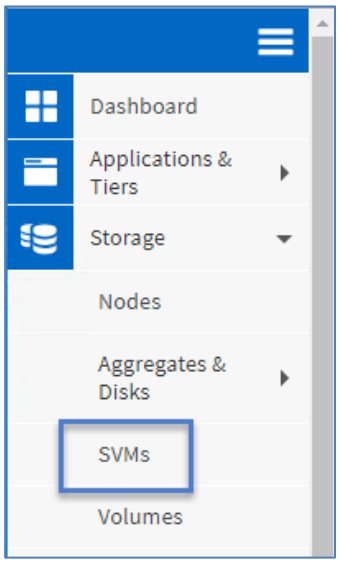
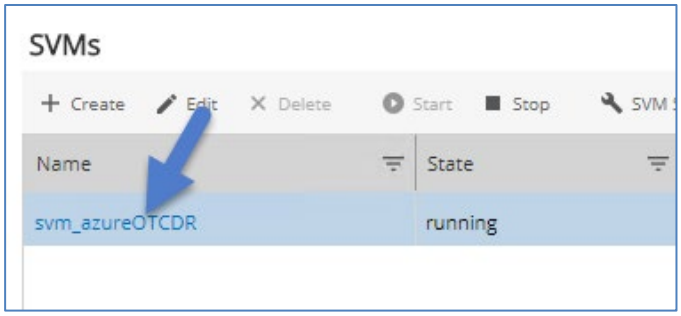
Step	Action
2-27	In the System Manger login page, enter the following: • For User name, enter **admin**. • For Password, enter **HappyCloud123**. 
2-28	In the left navigation pane, select **Storage** > **SVMs**. 
2-29	Click **svm_azureOTCDR**. 
2-30	Click **NFS**.

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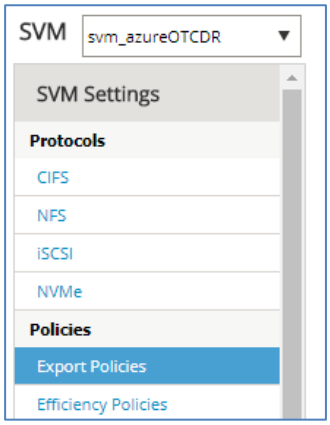
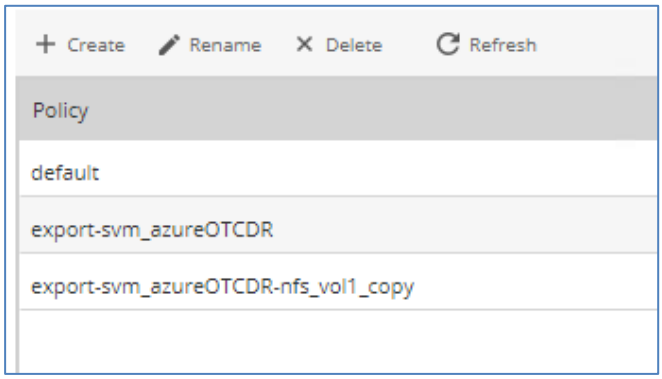
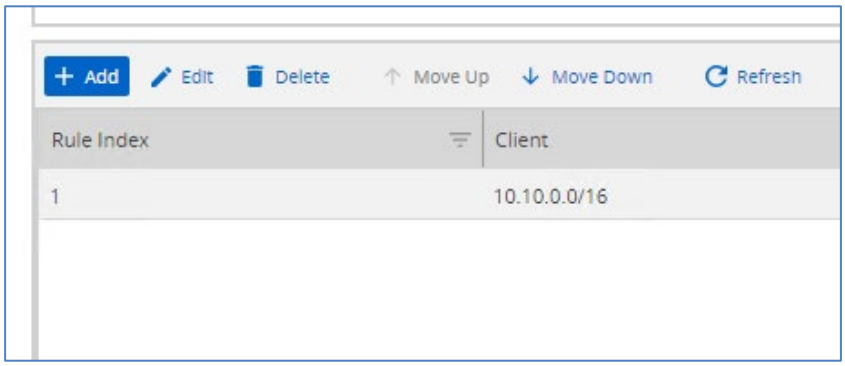
Step	Action
2-31	In the SVM Settings pane, click **Export Policies**. 
2-32	Select **export-svm_azureOTCDR-nfs_vol1_copy**. 
2-33	In the Export Rules at the bottom of the page, click **Add**. 

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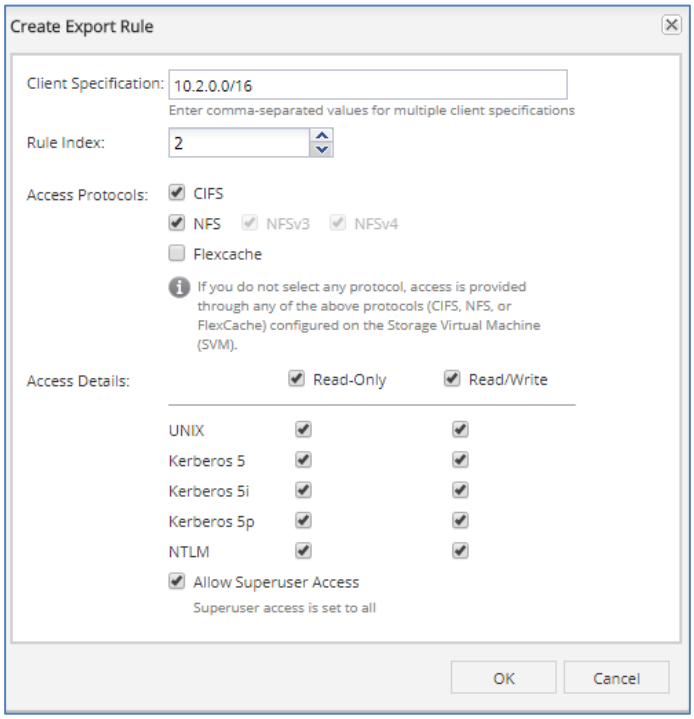
Step	Action
2-34	In the Create Export Rule window, do the following: • For the Client Specification enter, **10.2.0.0/16**. • For the Rule Index, select **2**. • For the Access Protocols, select **NFS** and **CIFS**. • Leave the rest of the values as the defaults. 
2-35	Click **OK.**
2-36	Repeat the same process for **export-svm_azureOTCDR.**

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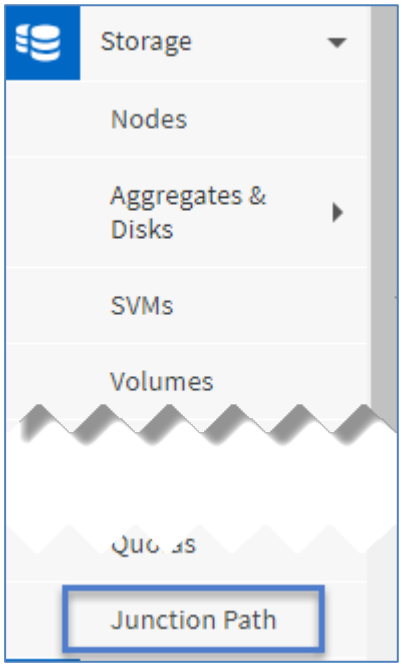
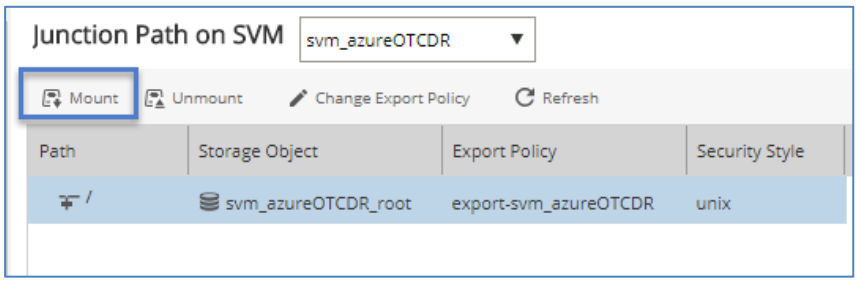
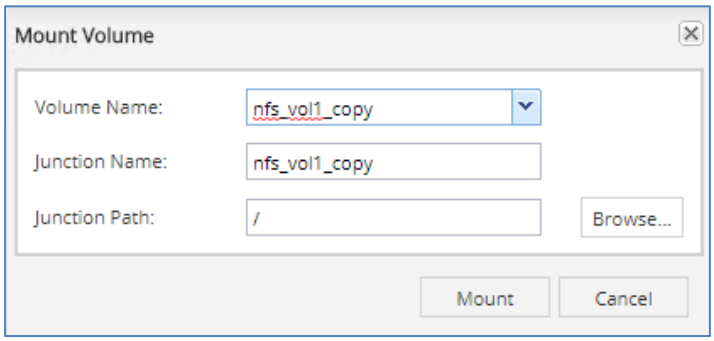
Step	Action
2-37	In the left navigation pane, select **Storage** > **Junction Path**. 
2-38	Click **Mount**. 
2-39	You will see a flash on your screen, what you do not see is this screenshot below. 

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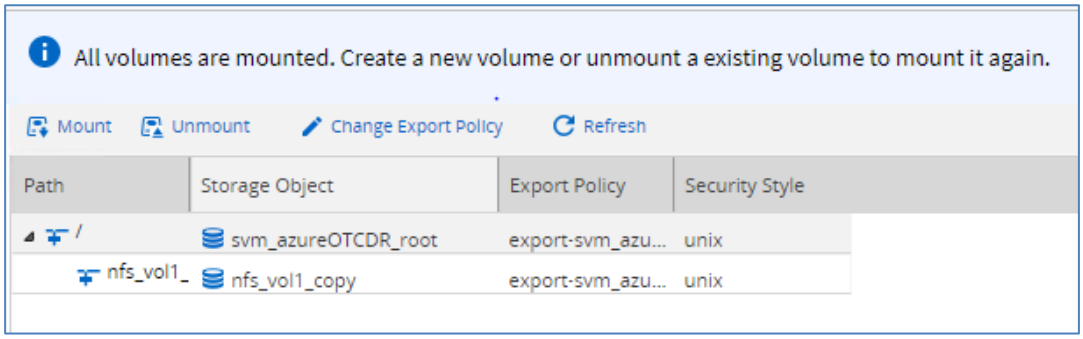
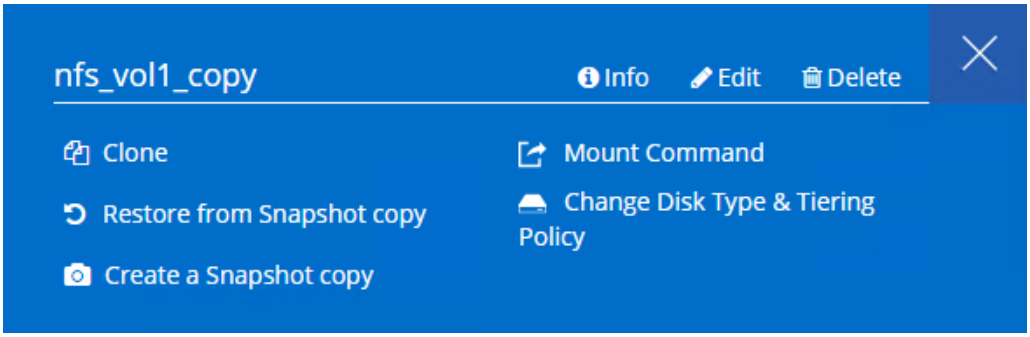
Step	Action
2-40	The volume is mounted. 
2-41	Return to Cloud Manager.
2-42	Select the **nfs_vol1_copy** menu, and then click **Mount Command**. 
2-43	Click **Copy**.
2-44	Return to the Red Hat Enterprise Linux VM, and enter the following command: [demoadmin@rhel74priv ~]$ **sudo mkdir /mnt/nfs_vol1_copy**
2-45	Return to the Secure Shell (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_copy**. c. Press **Enter**. Example command: `[demoadmin@rhel74priv ~]$ sudo mount 10.10.1.7:/nfs_vol1_copy /mnt/nfs_vol1_copy` `[sudo] password for demoadmin:` **`HappyCloud123`**
2-46	Enter the command: `[demoadmin@rhel74priv ~]$` **`cd /mnt/nfs_vol1_copy`**

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Step	Action

2-47	Verify that the 1G.test and NewFileBeforeDisaster exist in the volume:
	`[demoadmin@rhel77priv nfs_vol1_copy]$ ll -h`
	`total 491M`
	`-rw-rw-r--. 1 demoadmin demoadmin 489M Apr 30 14:19 500m.test`
	`-rw-rw-r--. 1 demoadmin demoadmin  0 Apr 30 14:21 NewFileBeforeDisaster`
	`[demoadmin@rhel77priv nfs_vol1_copy]$`

2-48	Write a new file into the volume: `[demoadmin@rhel74priv nfs_vol1_copy]$` **`touch NewFileWhileinDR`**

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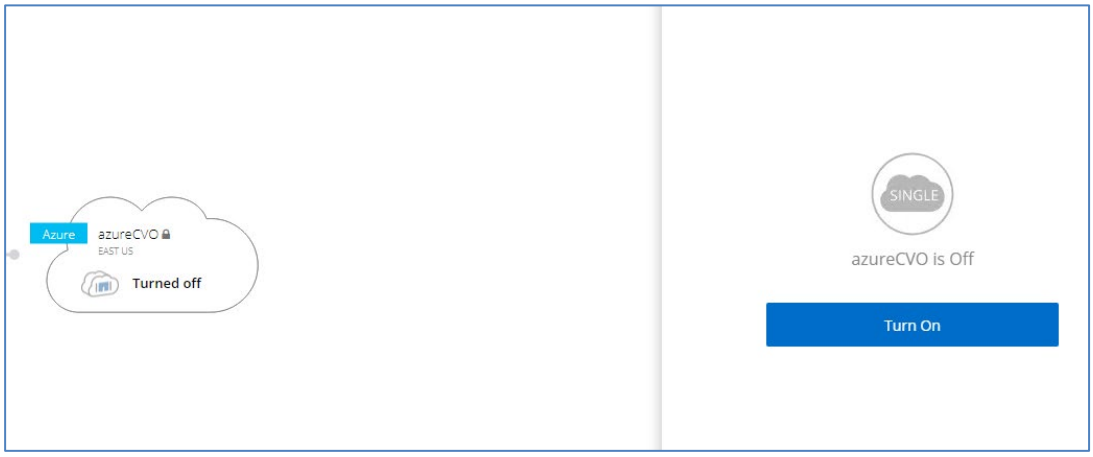
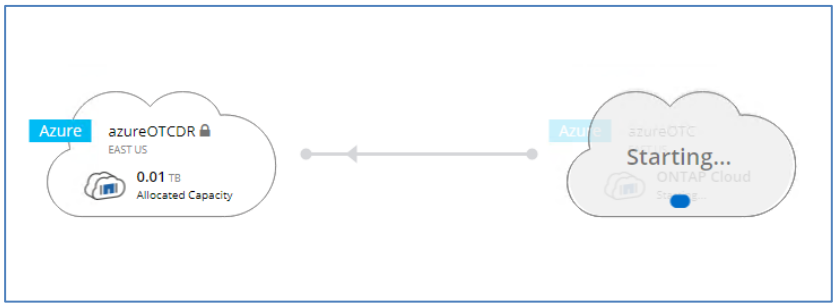
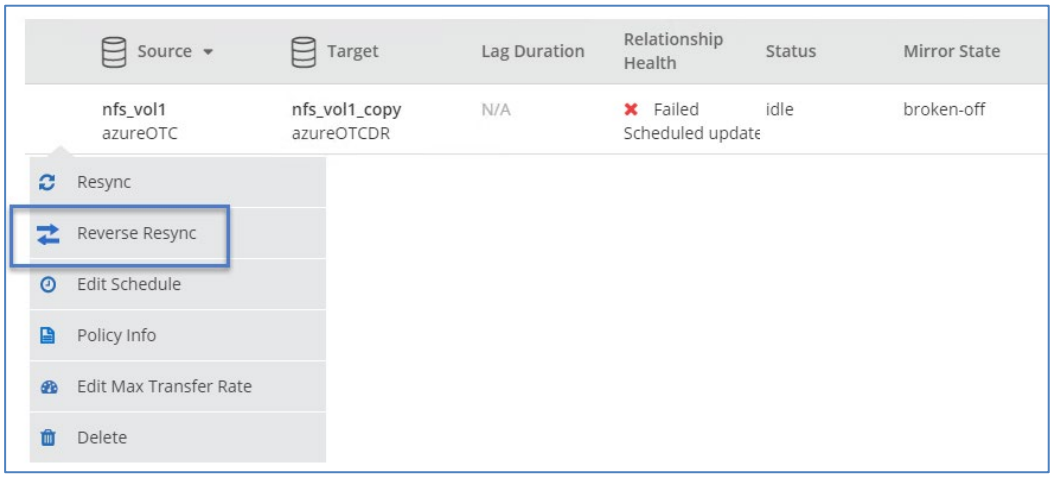
Task 3: Restore a SnapMirror Relationship

Step	Action
3-1	Return to the Working Environments page in Cloud Manager.
3-2	Select **azureCVO**, and then click **Turn On**. 
3-3	Wait for the azureCVO system to become available. 
3-4	Click the **Replication** tab.
3-5	Click the **Menu** icon and then select **Reverse Resync**. This action writes the new data that was written to the nfs_vol1_copy during disaster recovery back to the nfs_vol1. 

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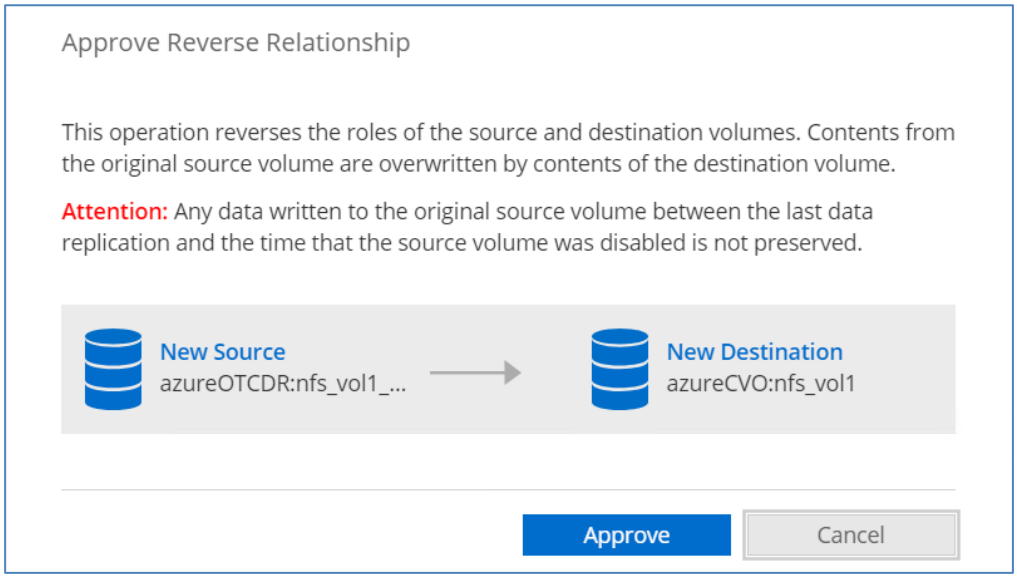
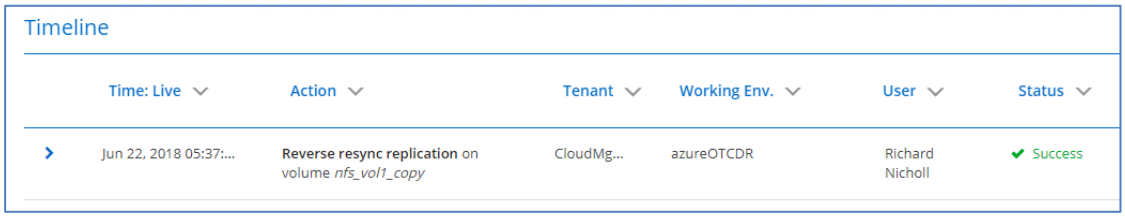
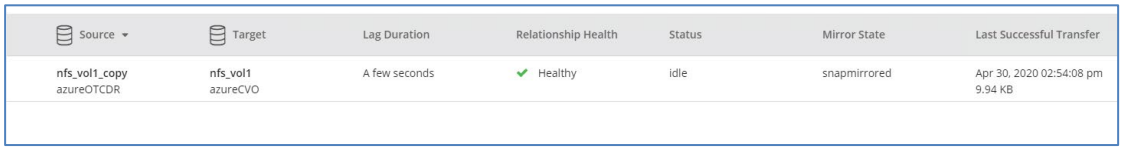
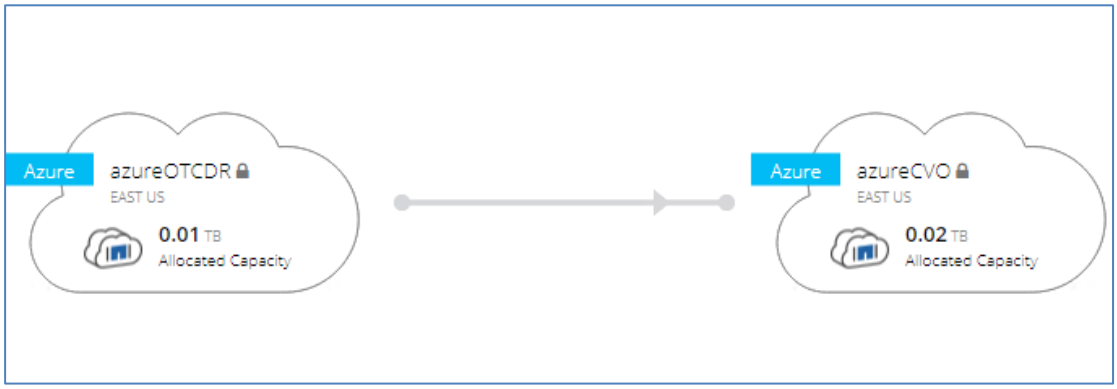
Step	Action
3-6	Read the Approve Reverse Relationship text, and then click **Approve**. 
3-7	You can view the status in the Timeline tab. Wait for the Status to be success. 
3-8	Click the Replication Status tab, and verify that the Relationship Health is Healthy. 
3-9	Click the Working Environments tab, and verify that the arrow that represents the SnapMirror relationship now has the source as azureOTCDR system and the destination as the azureOTC system. 
3-10	Click the **Replication Status** tab.

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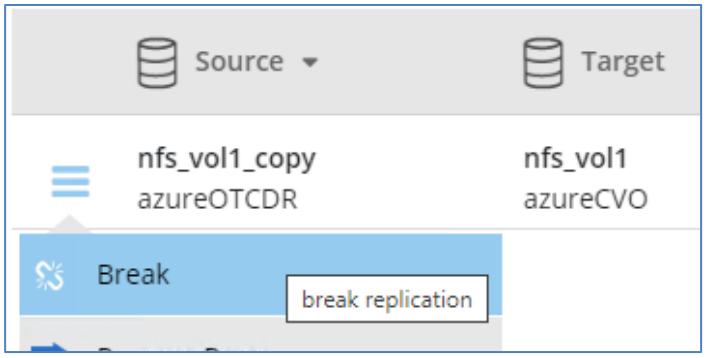
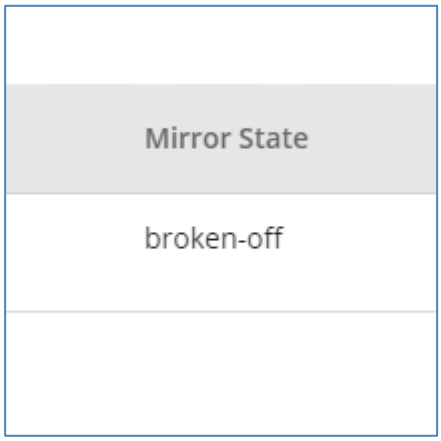
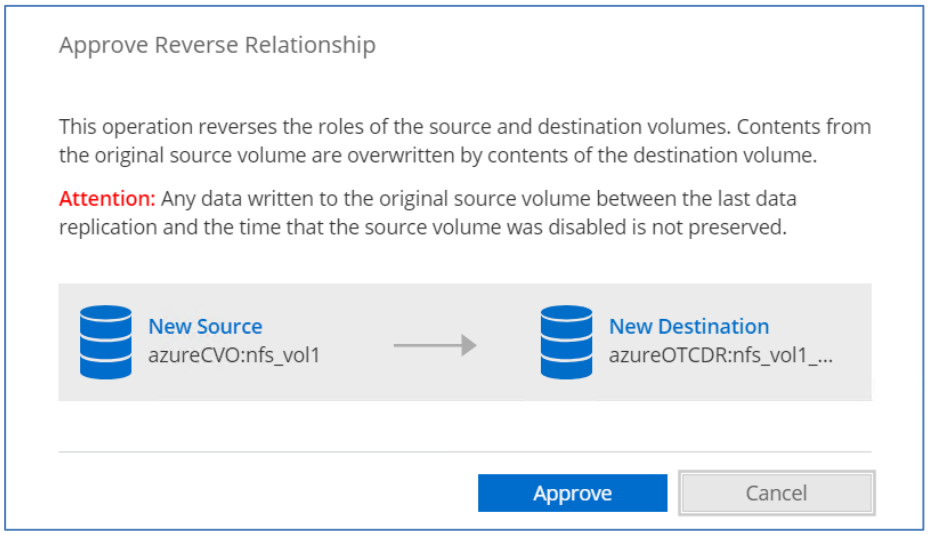
Step	Action
3-11	You need to revert the SnapMirror relationship to its original configuration. Click the menu icon, and then select **Break**. 
3-12	In the window that asks “Are you sure you want to break the relationship between ‘nfs_vol1_copy’ and ‘nfs_vol1,’” click **OK**.
3-13	Verify that the Mirror State is broken-off. 
3-14	Click the menu icon, and then select **Reverse Resync**.
3-15	In the Approve Reverse Relationship window, click **Approve**. 

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Step	Action
3-16	Click the Working Environments tab, and verify that the arrow has reverted to the source being azureCVO and the destination being azureOTCDR.
3-17	You should now be able to mount the original nfs_vol1 volume and verify that it contains all the data, including the **`NewFileWhileinDR`** file. Also, you should be able to write data to nfs_vol1.
3-18	Break and delete the SnapMirror relationship, then shut down and delete **azureOTCDR**.

End of Exercise

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