Exercise 2: Managing FlexClone Volumes

In this exercise, you explore and manage FlexClone volumes.

Objectives

This exercise focuses on enabling you to create and split a FlexClone volume.

Case Study

The rocket motor division of Zarrot Industries is bringing a new customer relations application online. Before going live, the new application needs to be tested. You make a clone of the customer relations data so that the new application can be realistically tested without risking actual data.

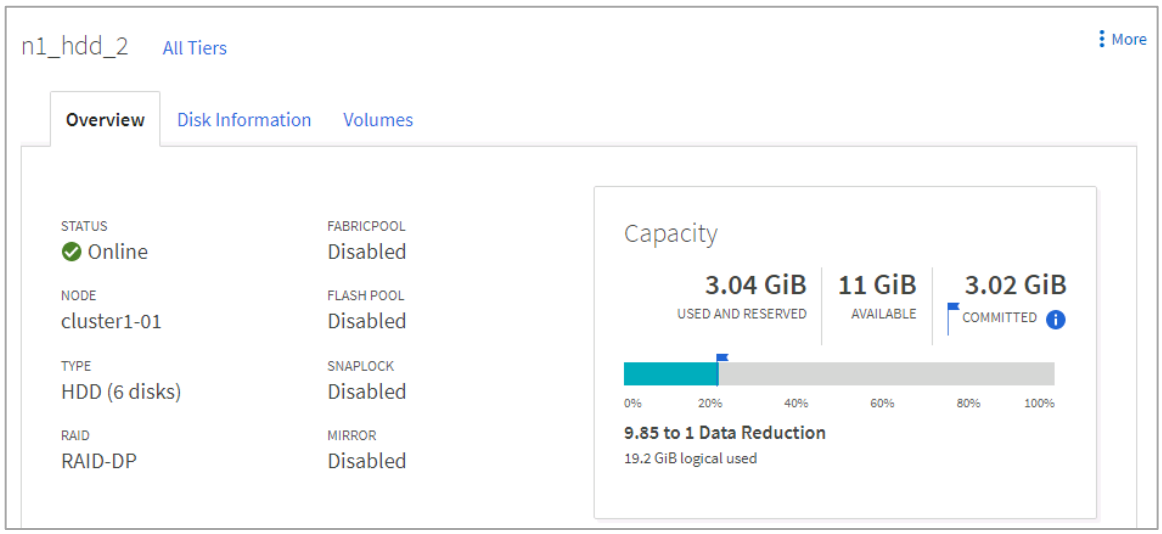
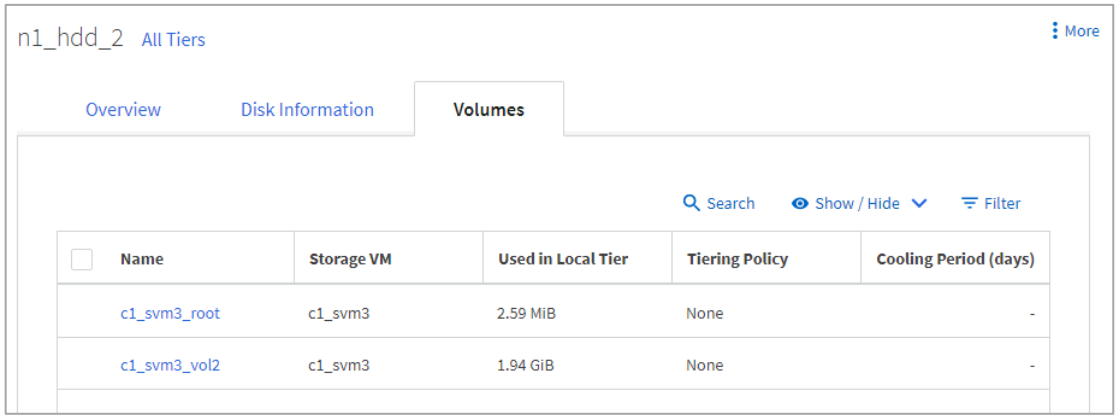
Lab Equipment

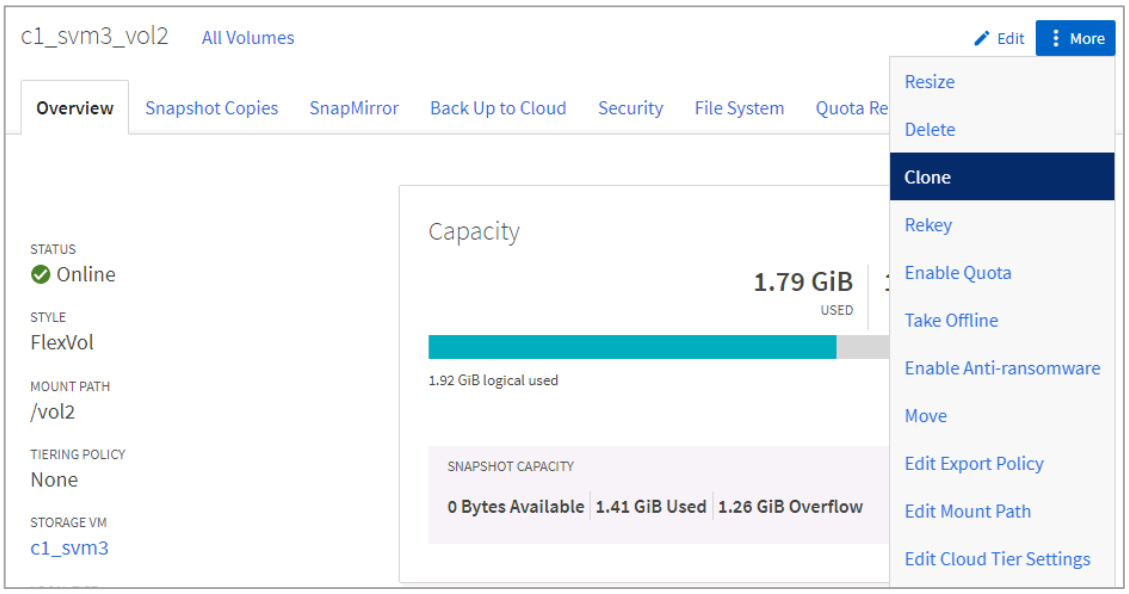
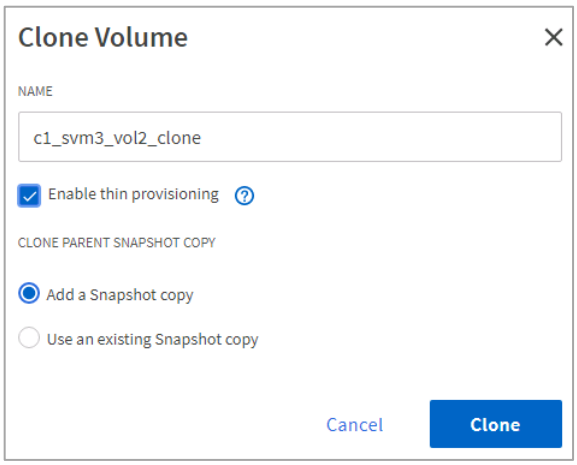
Use the following equipment to complete the exercise:

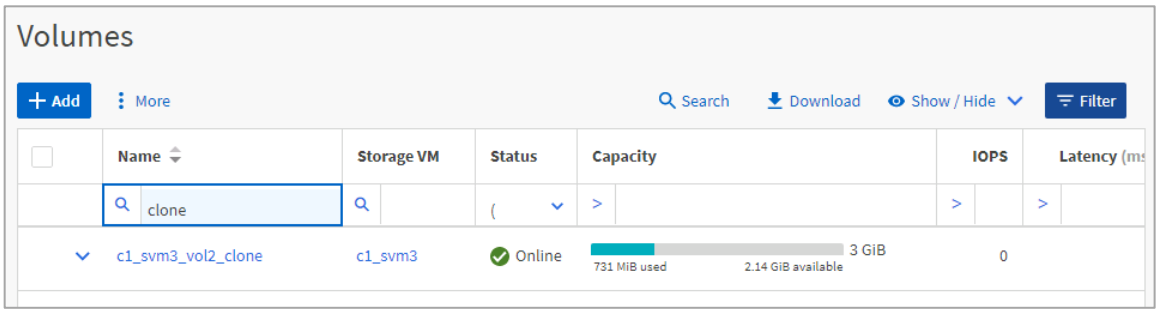
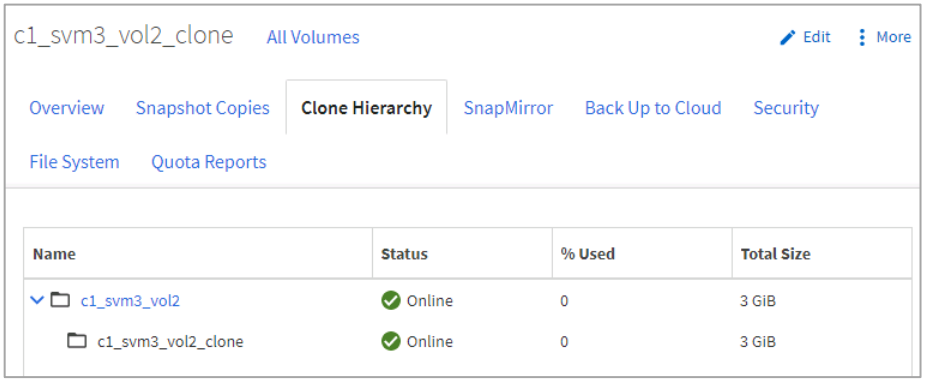
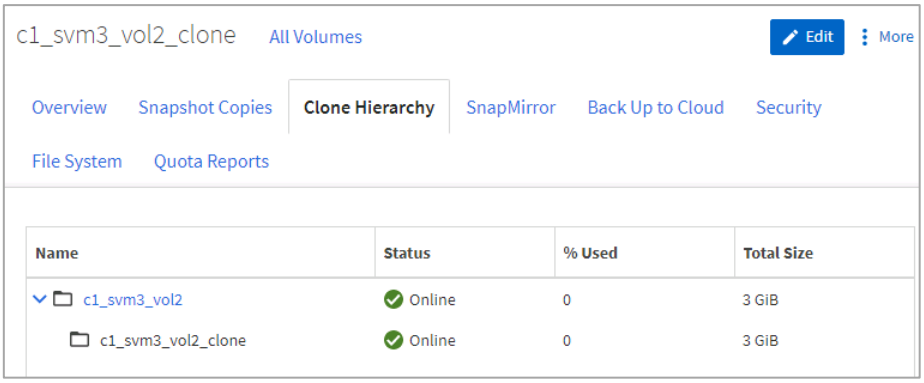
System	Host Name	IP Addresses	User Name	Password
Windows Server	jumphost	192.168.0.5	DEMO\Administrator	Netapp1!
ONTAP cluster-management LIF (cluster1)	cluster1	192.168.0.101	admin (case sensitive)	Netapp1!

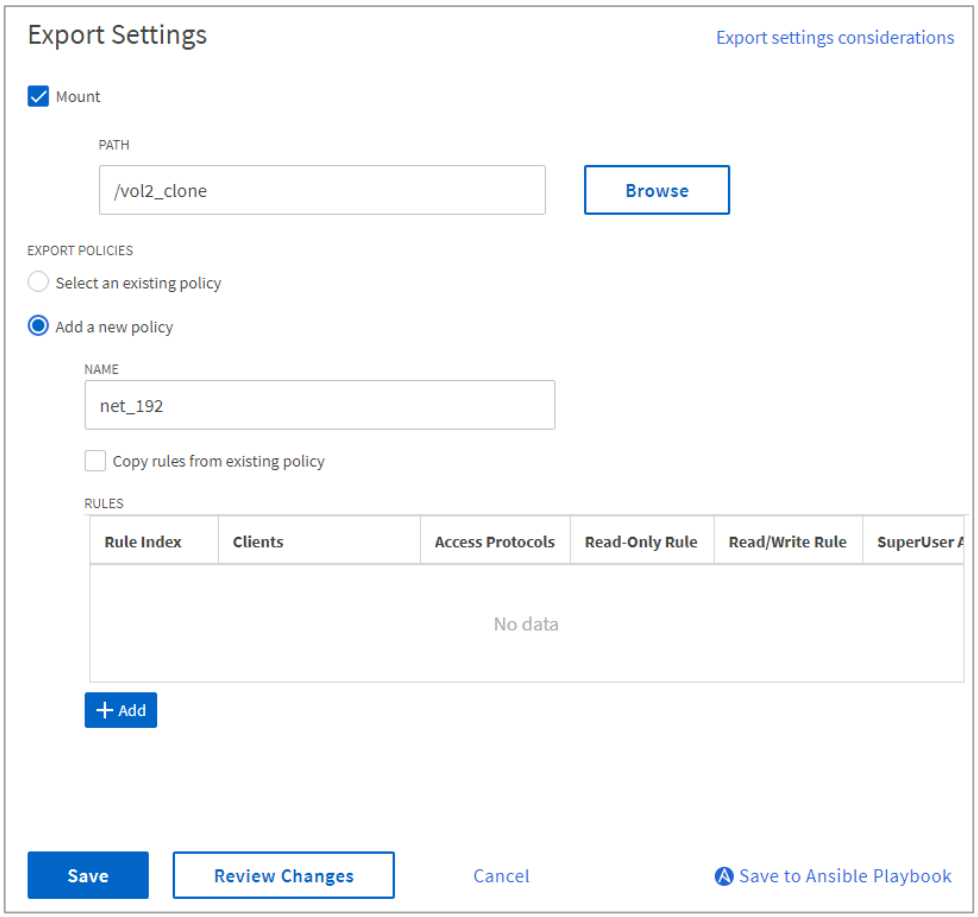
Task 1: Create and Split a FlexClone Volume

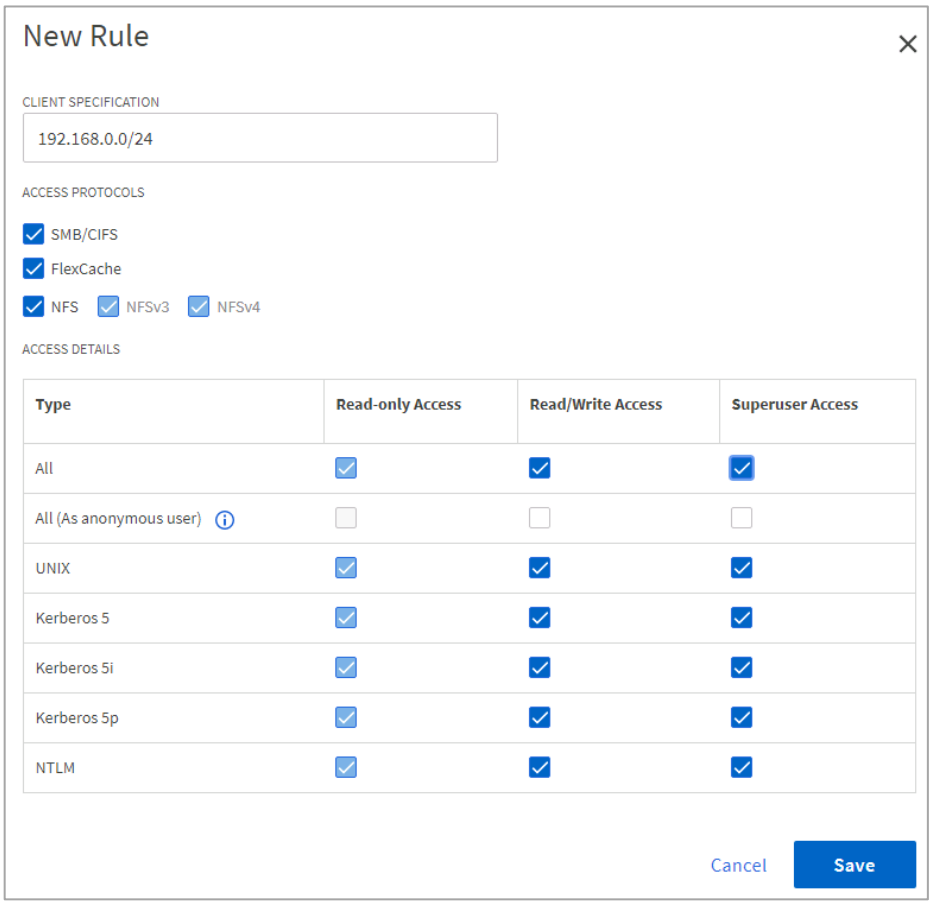
Step	Action
1-1	Log in to NetApp ONTAP System Manager for **cluster1**.
1-2	From the System Manager menu, select **Storage > Volumes**.
1-3	In the Volumes pane, click **c1_svm3_vol2**.
1-4	On the c1_svm3_vol2 details page, click the **Overview** tab, and then click the local storage tier name **n1_hdd_2**.

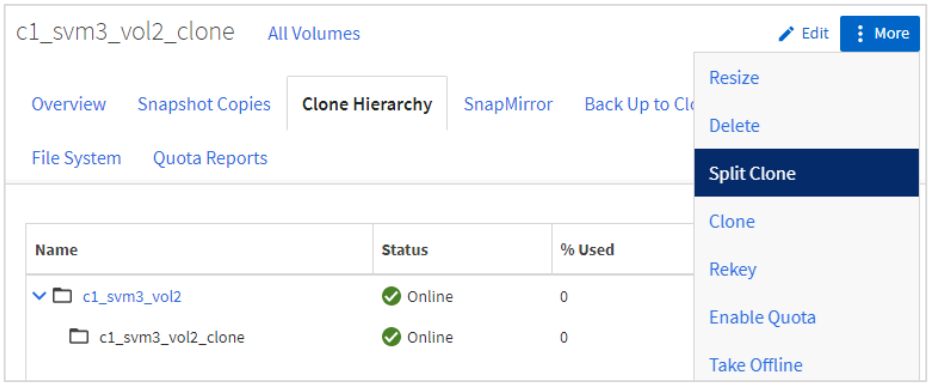
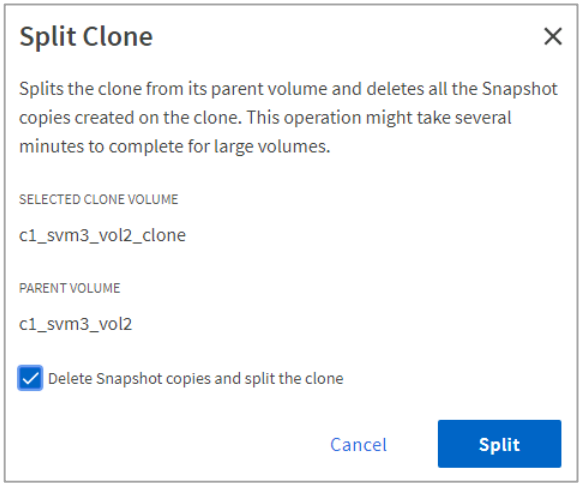
Step	Action
1-5	Examine the Overview tab of the local tier, and then answer the following questions: • How much of the aggregate capacity is used? _____ • What is the data reduction ratio? _____ 
1-6	Click the **Volumes** tab.
1-7	Observe the number of volumes in the aggregate and the amount of storage space that each volume uses in the local tier. 
1-8	Click **c1_svm3_vol2** to return to the volume page.

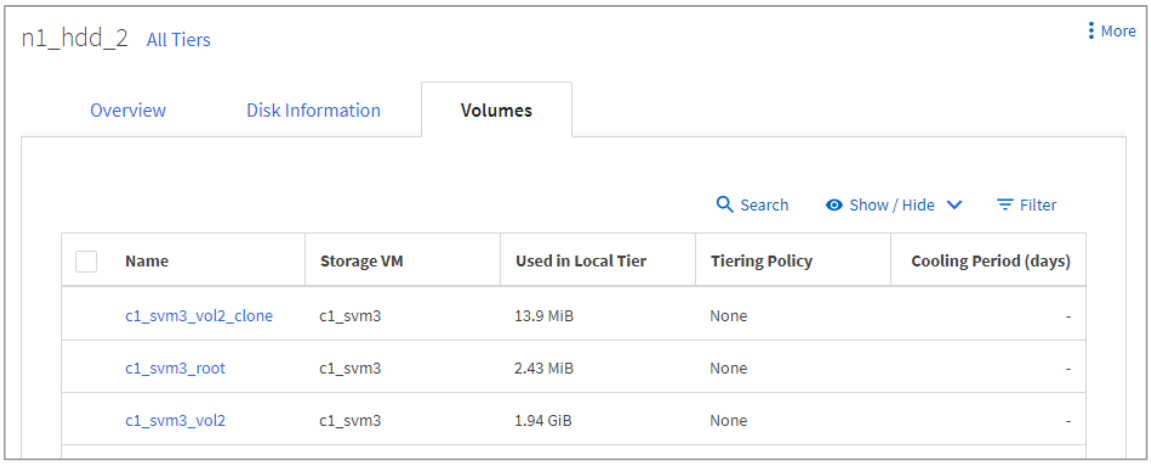
Step	Action
1-9	From the More menu, select **Clone.** 
1-10	In the Clone Volume dialog box, specify the following settings: • Name: **c1_svm3_vol2_clone** • Enable thin provisioning: **<selected>** • Add a Snapshot copy: **<selected>** (default) 
1-11	Click **Clone**.

Step	Action
1-12	In the Volumes pane, click the name of the new clone volume. 
1-13	On the volume details page, click the **Clone Hierarchy** tab, and then observe the parent Snapshot copy name. 
1-14	Click **Edit**. 

Step	Action
1-15	In the Export Settings section of the Edit Volume page, specify the following settings: • Mount: **<selected>** • Mount Path: **/vol2_clone** • Add a new policy: **<selected>** • Export policy name: **net_192** 
1-16	Click **Add** to create a new export rule.

Step	Action
1-17	In the New Rule window, specify the following settings: • Client specification: **192.168.0.0/24** • Grant all types of access to users whose identity is verified using any of the authentication methods. 
1-18	Click **Save** to create the new rule.
1-19	Click **Save** to complete your changes to the volume.
1-20	From PuTTY, log in to your Linux system.
1-21	Create the directory /mnt/clone: `mkdir /mnt/clone`
1-22	Mount the clone volume to your Linux computer: `mount -t nfs 192.168.0.62:/vol2_clone /mnt/clone`
1-23	Navigate to the clone volume: `cd /mnt/clone`
1-24	Create a file called clonefile: `echo "Edited from a FlexClone..." >> clonefile.txt`

Step	Action
1-25	List the contents of the clone directory: **`ls`** Sample output: `clonefile.txt  file1  file2  hugefile`
1-26	Review the contents of the file on the parent volume, and then verify that although the clone and parent share data blocks, they function as separate volumes: **`cd ../svm3/vol2`** **`ls`** Sample output: `file1  file2  hugefile`
1-27	Return to System Manager for cluster1.
1-28	In the volume details view of the clone, from the More menu, select **Split Clone**. 
1-29	In the Split Clone dialog box, select **Delete Snapshot copies and split the clone**, and then click **Split.** **Note:** The split takes some time. 

Step	Action
1-30	On the Volumes page, review the status. **Note:** When the split finishes, the clone no longer shares blocks with the parent and is a separate volume.
1-31	From the System Manager menu, select **Storage > Tiers**, and then select **n1_hdd_2**.
1-32	Click the **Volumes** tab, and then answer the following questions: • Has the amount of Used Space increased, decreased, or remained the same? _____ • Is there an ONTAP software efficiency feature that would explain why or why not? _____ 

Task 2: Enable Logical Space Reporting and Enforcement

Step	Action
2-1	Open a PuTTY session to cluster1.

2-2	View the available and used physical space and available and used logical space in vol2 and its clones in c1_svm3:
	`volume show -vserver c1_svm3 -volume c1_svm3_vol2* -fields available,physical-used,logical-used,logical-available`
	Sample output:
	`vserver volume available physical-used logical-used logical-available`
	`------- ---------- --------- ------------- ------------ -----------------`
	`c1_svm3 c1_svm3_vol2 1.06GB 1.94GB 3.00GB -`
	`c1_svm3 c1_svm3_vol2_clone 2.84GB 13.92MB 1.92GB -`
	`2 entries were displayed.`

2-3	Enable logical space reporting for vol2 and its clones: **`volume modify -vserver c1_svm3 -volume c1_svm3_vol2* -is-space-reporting-logical true`**

Step	Action
2-4	Enable logical space enforcement on vol2 and its clones: **volume modify -vserver c1_svm3 -volume c1_svm3_vol2* -is-space-enforcement-logical true**
2-5	Type **y** to confirm the exception for any volumes that are not thin-provisioned.

2-6	View the differences in available and used physical space and available and used logical space in the NFS volumes in c1_svm3:
	volume show -vserver c1_svm3 -volume c1_svm3_vol2* -fields available,physical-used,logical-used,logical-available
	Sample output:
	`vserver volume available physical-used logical-used logical-available`
	`------- ------------ --------- ------------- ------------ -----------------`
	`c1_svm3 c1_svm3_vol2 1.06GB 1.94GB 3.00GB 1.06GB`
	`c1_svm3 c1_svm3_vol2_clone 2.84GB 13.92MB 1.92GB 949.8MB`
	`2 entries were displayed.`

End of exercise