Module 2: Cluster Setup

Exercise 1: Exploring ONTAP Management UIs

In this exercise, you explore the NetApp ONTAP clustershell CLI and NetApp ONTAP System Manager. You use both interfaces throughout this course.

Objectives

This exercise focuses on enabling you to do the following:

- Explore the clustershell CLI
- Navigate clustershell command directories
- Use the set command to adjust preferences
- Use the Tab key to complete commands
- Review command history
- Explore the ONTAP System Manager UI

Case Study

The NetApp storage system has arrived from Dwurgle Enterprises with the most recent version of NetApp ONTAP software installed. You need to explore the ONTAP CLI and adjust the settings to your preferences. Next, you need to explore the new ONTAP System Manager UI.

Lab Equipment

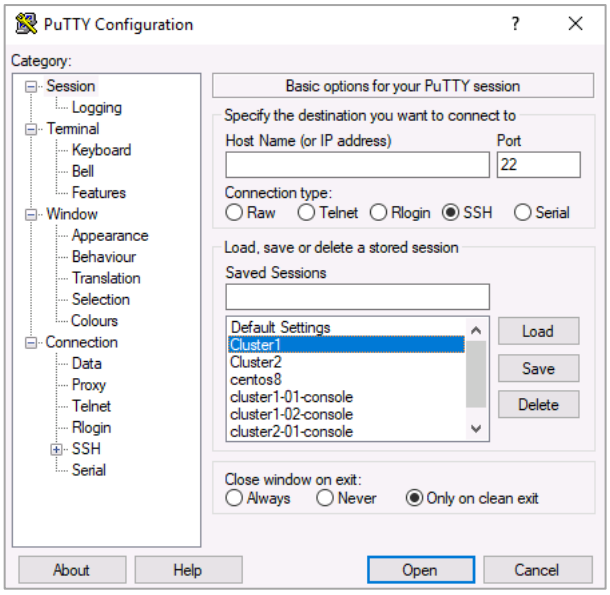
Use the following equipment to complete the exercise:

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!
ONTAP cluster-management LIF (cluster2)	cluster2	192.168.0.102	admin (case-sensitive)	Netapp1!

Task 1: Explore the Clustershell CLI

In this task, you log in to and navigate the clustershell CLI, and you view the manual pages.

Step	Action
1-1	From your Windows desktop, start the PuTTY application. 

Step	Action
1-2	In the PuTTY Configuration dialog box, verify that the cluster1 saved session is listed, and then double-click **Cluster1**. 
1-3	Use the following credentials to log in to cluster1: • log in as: **admin** • Password: **Netapp1!**
1-4	Remove the timeout threshold for sessions to the cluster: **`system timeout modify -timeout 0`**
1-5	Disabling automatic logout weakens security and should never be done outside of training environments.
1-6	Review the commands and command directories at the top level of the command hierarchy: **`?`**
1-7	You do not need to press Enter after typing a question mark. You can resize the PuTTY window to display more than 24 rows.
1-8	An entry that ends with a right-angle bracket (>) symbol is a command directory rather than a command. The structure resembles a UNIX or DOS shell, in that you cannot run command directory names as you do commands, but you can navigate to command directories. Command directories can contain subdirectories, commands, or both. Command directories are contextual and hierarchical groupings of commands. The command structure is not flat.
1-9	Review the objects in the `storage` command directory: **`storage ?`**
1-10	Erase the storage command from the prompt and then open the `cluster` directory: **`cluster`**

Step	Action
1-11	You can use the question mark at any level of the command hierarchy to see which commands and directories are available within that context. You notice that the clustershell prompt changes to indicate your context.
1-12	Review the available commands and directories at this level: **?**
1-13	Open the `statistics` directory: **statistics** You are now in the `cluster statistics` context.
1-14	Review the commands and directories that are available at this level: **?**
1-15	Go back one level by typing two periods and then pressing **Enter**: **..**
1-16	Verify that you are back at the `cluster` directory level.
1-17	From any level, you can type “top” to go directly to the top of the command hierarchy.
1-18	Examine the manual page for the `storage` command directory: **man storage**
1-19	Exit the manual page by entering **q**.
1-20	Examine the manual page for the `storage aggregate` directory, and compare the output with the output of the `man storage` command: **man storage aggregate**
1-21	Exit the manual page by entering **q**.
1-22	Examine the manual page for the `storage aggregate create` command: **man storage aggregate create**
1-23	Exit the manual page by entering **q**.

Task 2: Navigate Command Directories

Explore command directories and context, and use positional parameters.

Step	Action
2-1	Navigate to the `storage aggregate` directory level within the clustershell CLI: **storage aggr**

Step	Action
2-2	From the `storage aggregate` level, run the following command: **`modify ?`**
2-3	Square brackets (`[]`) indicate optional command elements. The output of this command shows the parameter `-aggregate` with brackets around the parameter name but not around the parameter value. The format means that the parameter name is optional, but the value is required. To save keystrokes, you can enter the aggregate name as a positional parameter rather than a named parameter. All other parameters and values are optional, except that if you enter a parameter value, you must also provide a parameter name. (The value cannot be specified based on position.) In this task, the aggregate name is required to determine which aggregate to modify. Although the other parameters are technically optional, you should specify at least one parameter for the command to be meaningful and to modify an attribute of the aggregate.
2-4	Review the possible keyword values for the `-state` parameter: **`modify -state ?`**
2-5	Type **<CNTL> C** to clear the command line.
2-6	Review the options for the `storage aggregate scrub` command: **`scrub ?`**
2-7	As with the `modify` command, the aggregate name is required, but the parameter name is optional. Also, the action value is required, but the parameter name (`action`) is optional. The command has two possible forms: • `storage aggregate scrub -aggregate aggr0_n1 -action start` • `storage aggregate scrub aggr0_n1 start`
2-8	Many commands also have additional information fields that are not shown with the default command syntax. You can see a list of these additional fields by using the `-fields` parameter.
2-9	Try this action with the `storage aggregate show` command: **`show -fields ?`**
2-10	Using the `-fields` paramater, display the name of node the aggregates are on and whether or not the aggregates are on their home node: **`show -fields node,is-home`**
2-11	Return to the top of the command hierarchy: **`top`**

Task 3: Use the `set` Command to Adjust Preferences

Use the `set` command to change privilege levels, display all available object attributes with a single command, and set a default storage VM (storage virtual machine, also known as SVM) for a clustershell session.

Step	Action
3-1	Look at the `volume` directory: **`volume ?`** The default privilege level is admin.
3-2	Review the commands that are available in this directory context at this privilege level.
3-3	Switch to the `advanced` privilege level: **`set -privilege advanced`**
3-4	 Because `-privilege` is an optional positional parameter of the `set` command, you can also specify the desired privilege level as a positional parameter: **`set advanced`**
3-5	While you are in the `advanced` privilege level, look again at the `volume` directory: **`volume ?`**
3-6	Review the other available commands.
3-7	 Each command and directory that is available for privilege levels other than `admin` has an asterisk (`*`) in front of the description.
3-8	Switch back to the `admin` privilege level: **`set admin`**
3-9	Return to the top of the command hierarchy: **`top`**
3-10	Look at the `set` directory: **`set ?`**
3-11	Display the list of nodes in the cluster: **`system node show`**
3-12	Set the option to show all fields in a query: **`set -showallfields true`**
3-13	Display the list of nodes in the cluster again: **`system node show`**
3-14	Adjust the width of your PuTTY window to correctly show all the fields in the command output, and then repeat the command that you entered in the previous step.
3-15	Turn off the option to show all fields: **`set -showallfields false`**
3-16	Display the list of volumes on the cluster: **`vol show`**

Step	Action
3-17	Set the default storage VM for your clustershell session to `c1_svm1`: **`set -vserver c1_svm1`**
3-18	View the list of volumes again: **`vol show`**
3-19	 You see only volumes that are associated with `c1_svm1`.
3-20	Turn off the default storage VM: **`set -vserver ""`**
3-21	Verify that the default storage VM is unset. **`set`**

Task 4: Use the Tab Key to Complete Commands

In this task, you enter command shortcuts and use Tab completion to simplify command syntax.

Step	Action
4-1	Display the LIFs: **`network interface show`**
4-2	Enter the following command: **`net i show`**
4-3	 The command fails because the form that you entered is ambiguous. Multiple options in the command hierarchy begin with the letter “i.”
4-4	Enter the command again, using `in`: **`net in show`**
4-5	Type **`ne`** (the first two letters of the `network` command directory), and then press **Tab**.
4-6	 When you enter an unambiguous substring and press Tab, the clustershell completes the substring.
4-7	Continue the command: • Type **`in`**, and then press **Tab**. • Type **`re`**, and then press **Tab**. You notice that `re` is ambiguous in this context. The clustershell displays the options for `re`.

Step	Action
4-8	Complete the command: • Type **ne**, and then press **Tab**. • Type **in**, and then press **Tab**. Type **revert *** and then press **Enter**

Task 5: Review Command History

Use the `history` command, the `redo` command, and the up arrow to retrieve previous commands.

Step	Action
5-1	Enter the following commands: **net int show** **net port show** **cluster show**
5-2	From the command line, press the up-arrow key multiple times to recall previous commands.
5-3	Press the down-arrow key to scroll back through the commands.
5-4	Review the command history: **history**
5-5	Rerun the most recent command: **redo**
5-6	The most recent command is `history`, which is the final command in the history list.
5-7	Check the history again: **history**
5-8	Rerun the command that was issued three commands ago: **redo -3**
5-9	Find the `vol show` command in the history list, and run the command by using the command number: **redo *<command_number>***
5-10	The number that is associated with the `vol show` command varies, based on the number of commands that you ran in this session.

Task 6: Explore the ONTAP System Manager UI

Step	Action
6-1	NetApp ONTAP System Manager is not a separate application. System Manager is a management solution that is built in to the ONTAP software. To access System Manager, you open a browser, connect to the cluster management LIF, and authenticate with the cluster admin username and password:

System	Host Name	IP Address	User Name	Password
ONTAP cluster management LIF	cluster1	192.168.0.101	admin (case sensitive)	Netapp1!

6-2

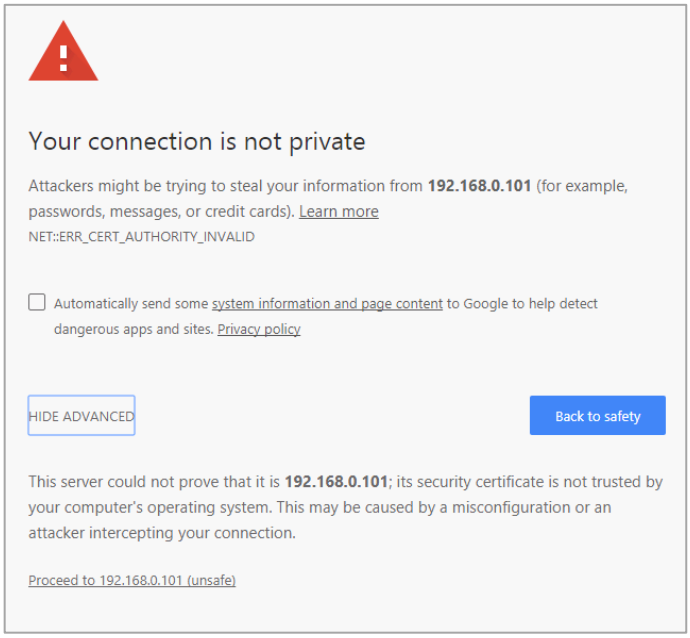
From the Windows Server desktop, access System Manager on cluster1:

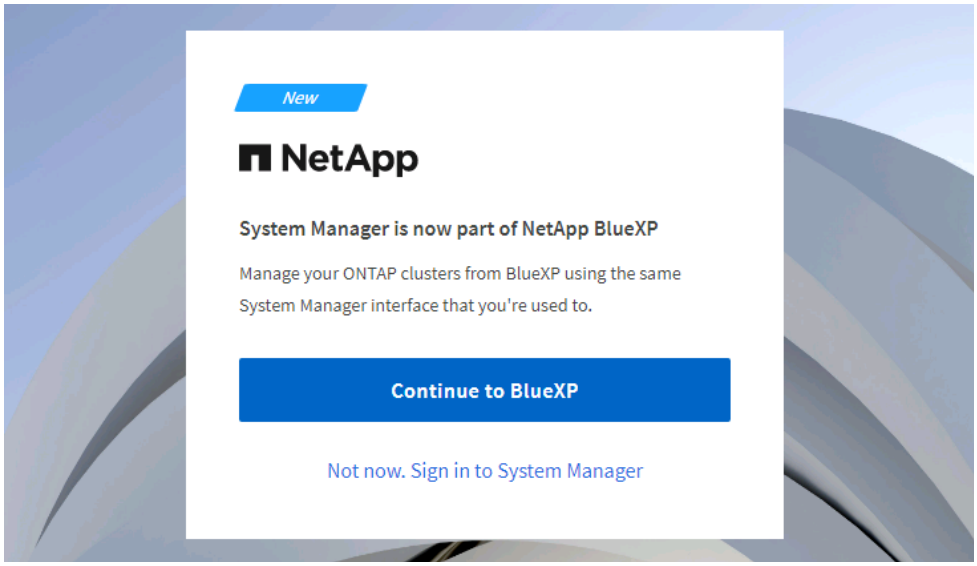
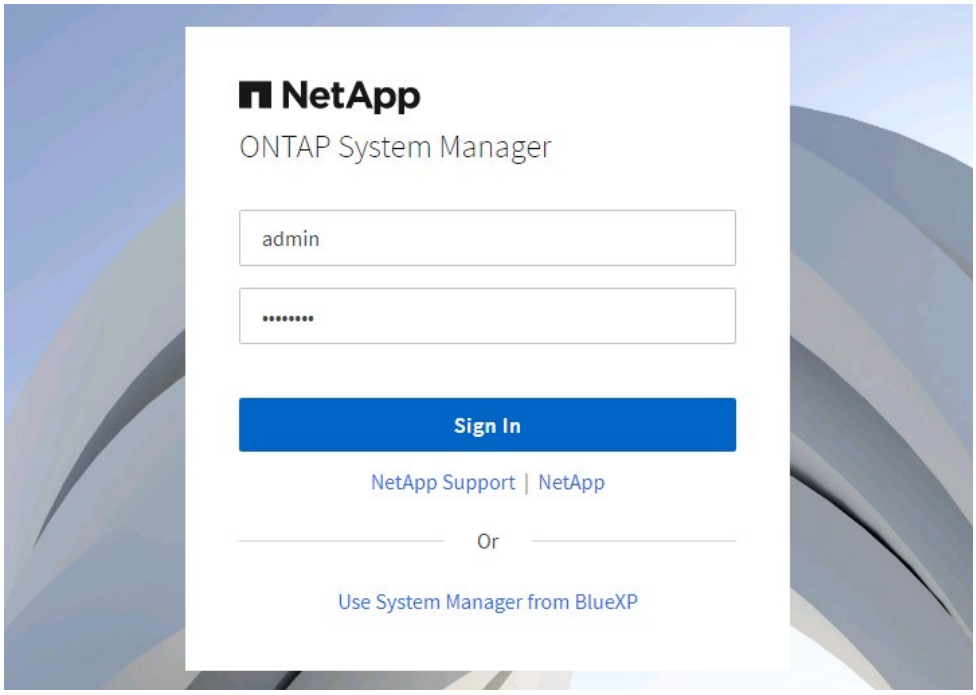
1. Open the Chrome web browser.

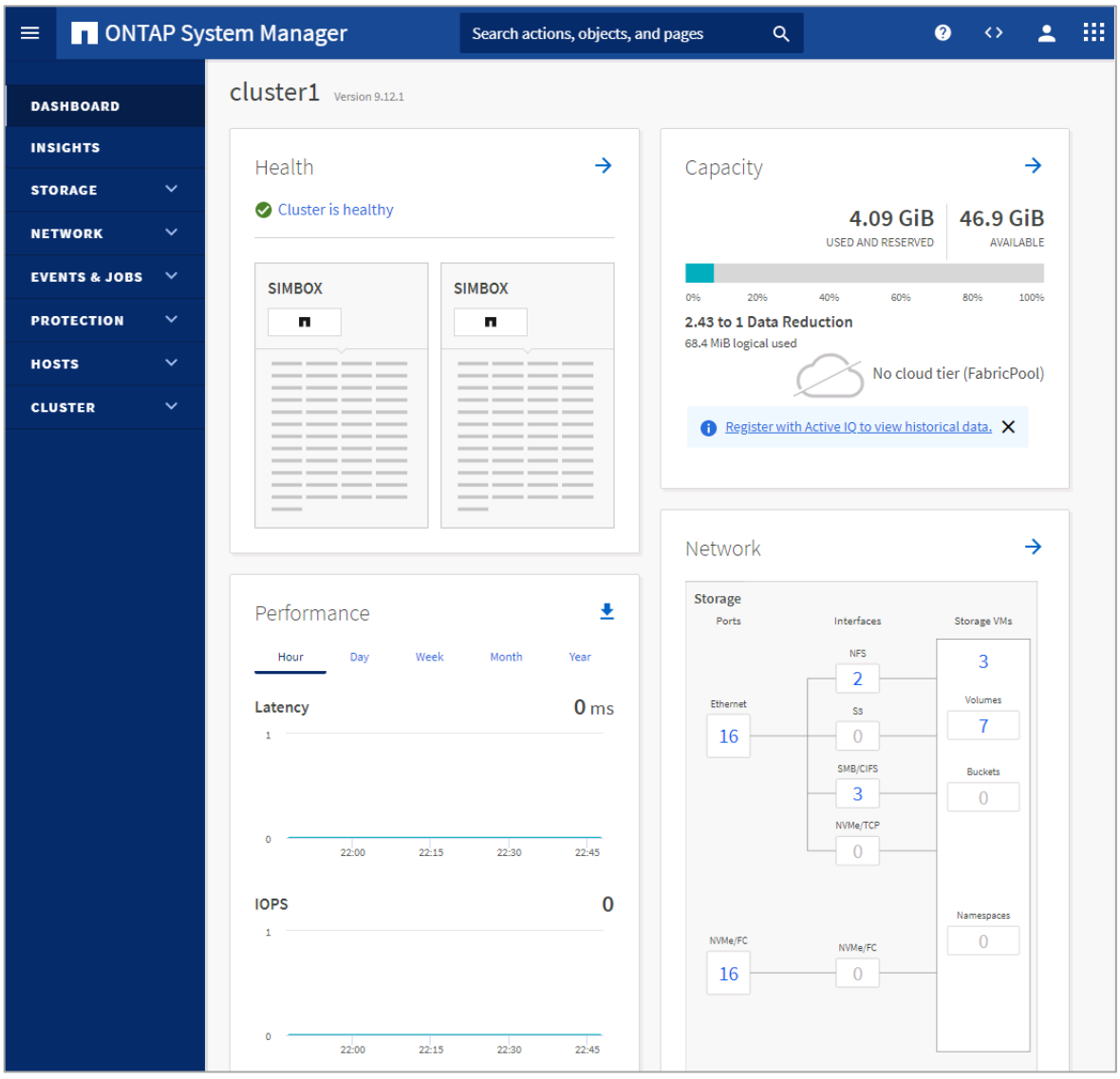
2. In the address bar, enter the cluster-management LIF IP address:
   `https://192.168.0.101`

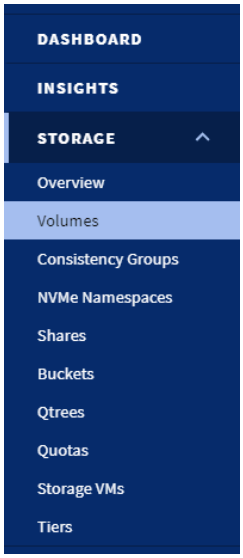
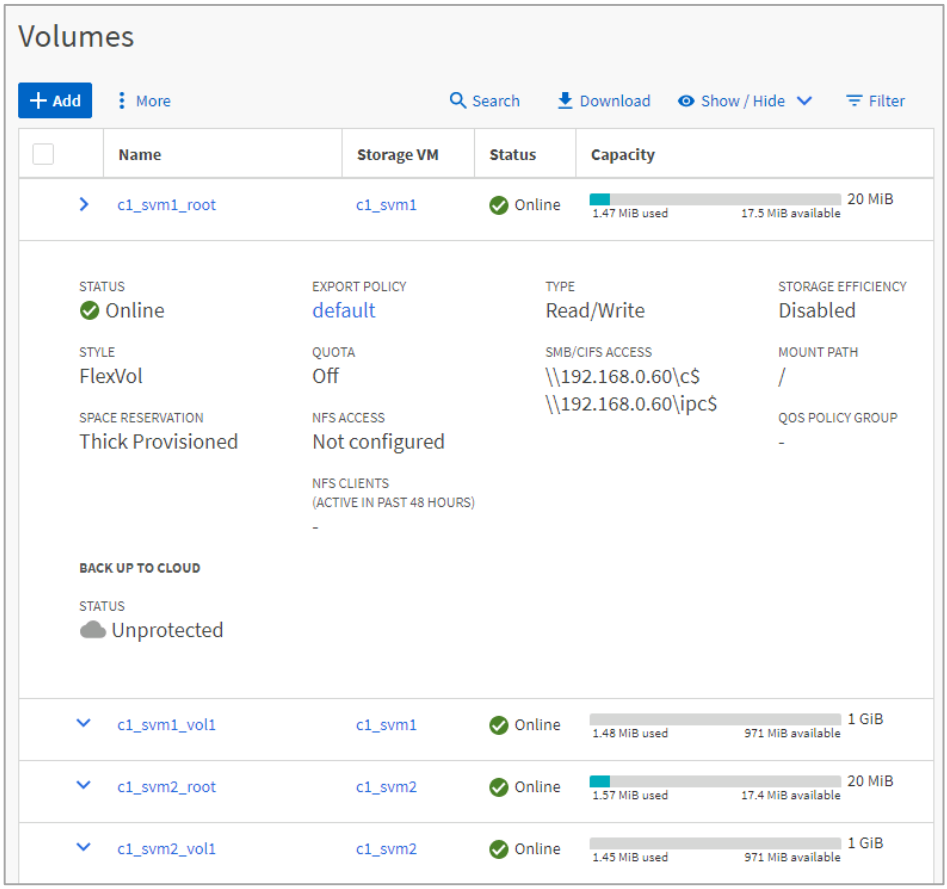
6-3

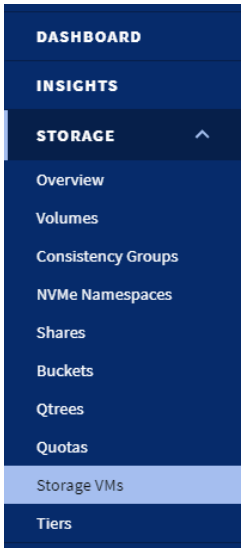
If you are prompted, click **Advanced** and click **Proceed to 192.168.0.101 (Unsafe)** to proceed to ONTAP System Manager.

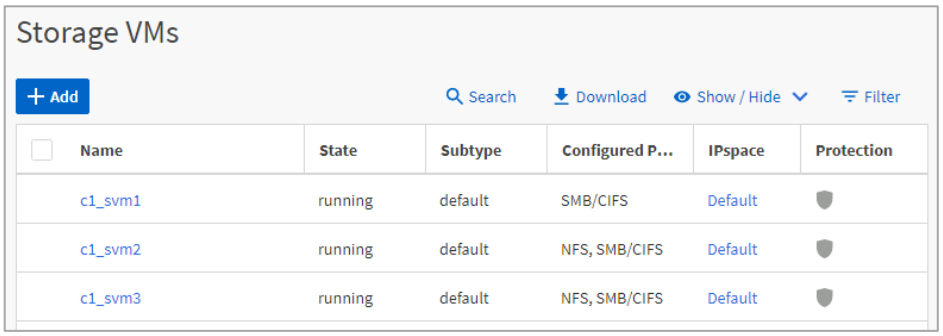
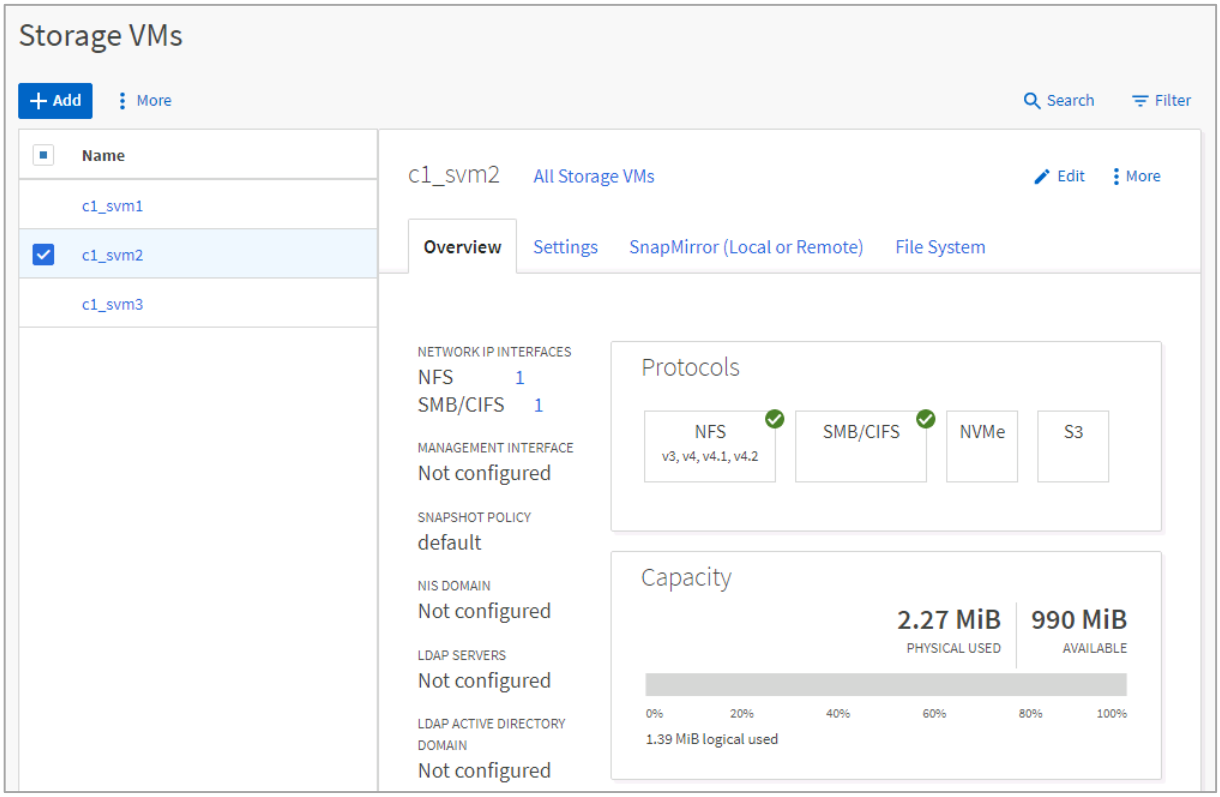


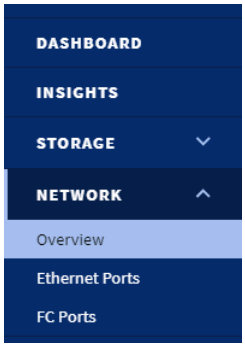
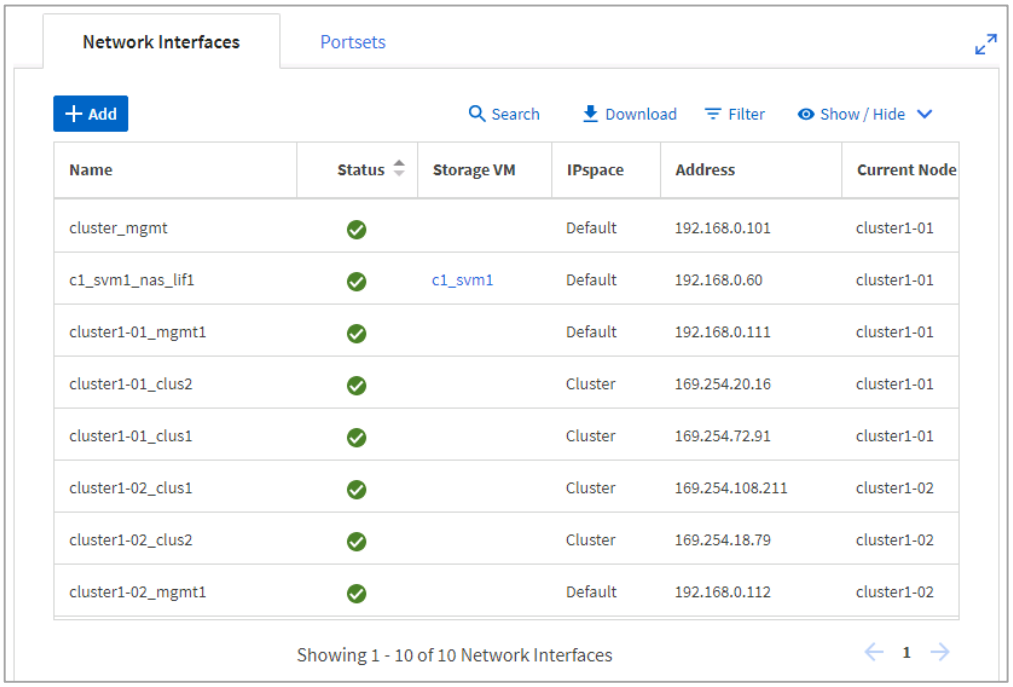
Step	Action
6-4	Click **Not now. Sign on to System Manager** to bypass NetApp BlueXP and access cluster1 directly. 
6-5	When the System Manager window opens, enter your login credentials: • Username: **admin** • Password: **Netapp1!** 

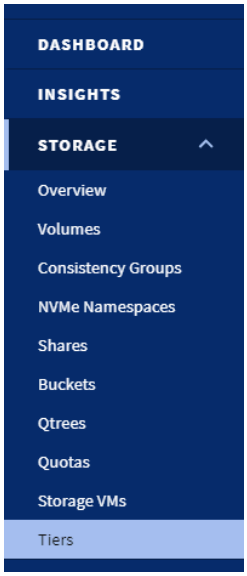
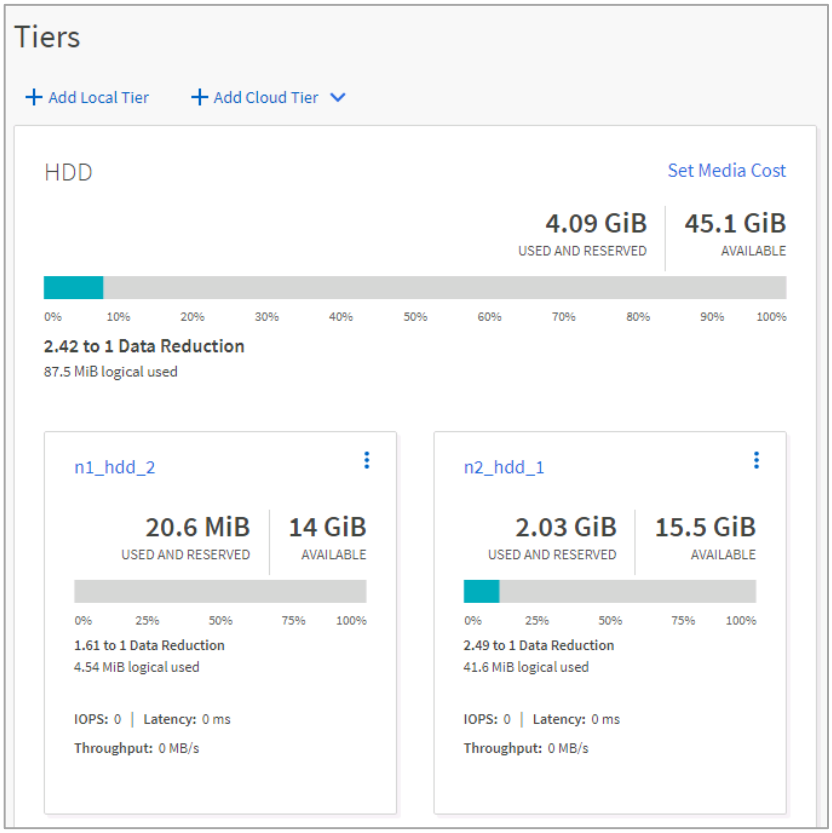
Step	Action
6-6	Review the information on the Dashboard, which is the System Manager landing page: 
6-7	Use the Dashboard to answer the following questions: • How many nodes are in the cluster? _____ • How many storage VMs are configured? _____ • What are the savings from storage efficiency? _____ In the Performance pane, which information is presented? _____

Step	Action
6-8	From the System Manager menu, select **Storage > Volumes**: 
6-9	Review the Volumes pane and volume information, and then expand each row by clicking the chevron (“V”) in the first column. 

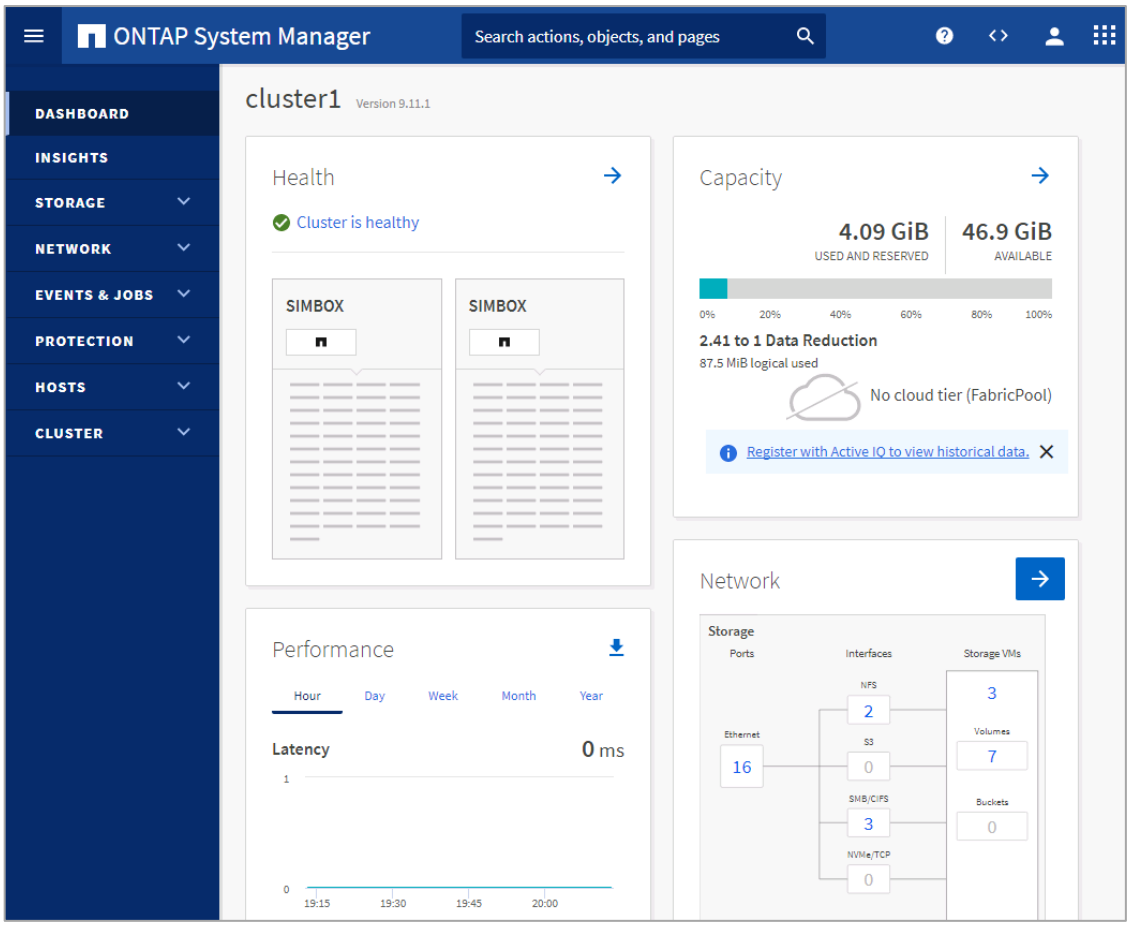
Step	Action
6-10	From the Windows Server desktop, access NetApp ONTAP System Manager on **cluster2** by following these steps: 1. Open a web browser. 2. In the address bar, enter the cluster-management LIF IP address: `https://192.168.0.102/`
6-11	If you are prompted, click **Advanced** and click **Proceed to 192.168.0.102 (Unsafe)** to proceed to ONTAP System Manager.
6-12	Click **Not now. Sign on to System Manager** to bypass BlueXP and access cluster2 directly.
6-13	When the System Manager window opens, enter your login credentials: • User name: **admin** • Password: **Netapp1!**
6-14	Compare the menu bars between the two clusters.
6-15	Answer the following questions: • Is there a LUNs tab on the cluster1 Storage menu bar? _____ • If not, why not? _____
6-16	Return to the System Manager session for **cluster1** (192.168.0.101).
6-17	From the System Manager menu, select **Storage > Storage VMs**. 

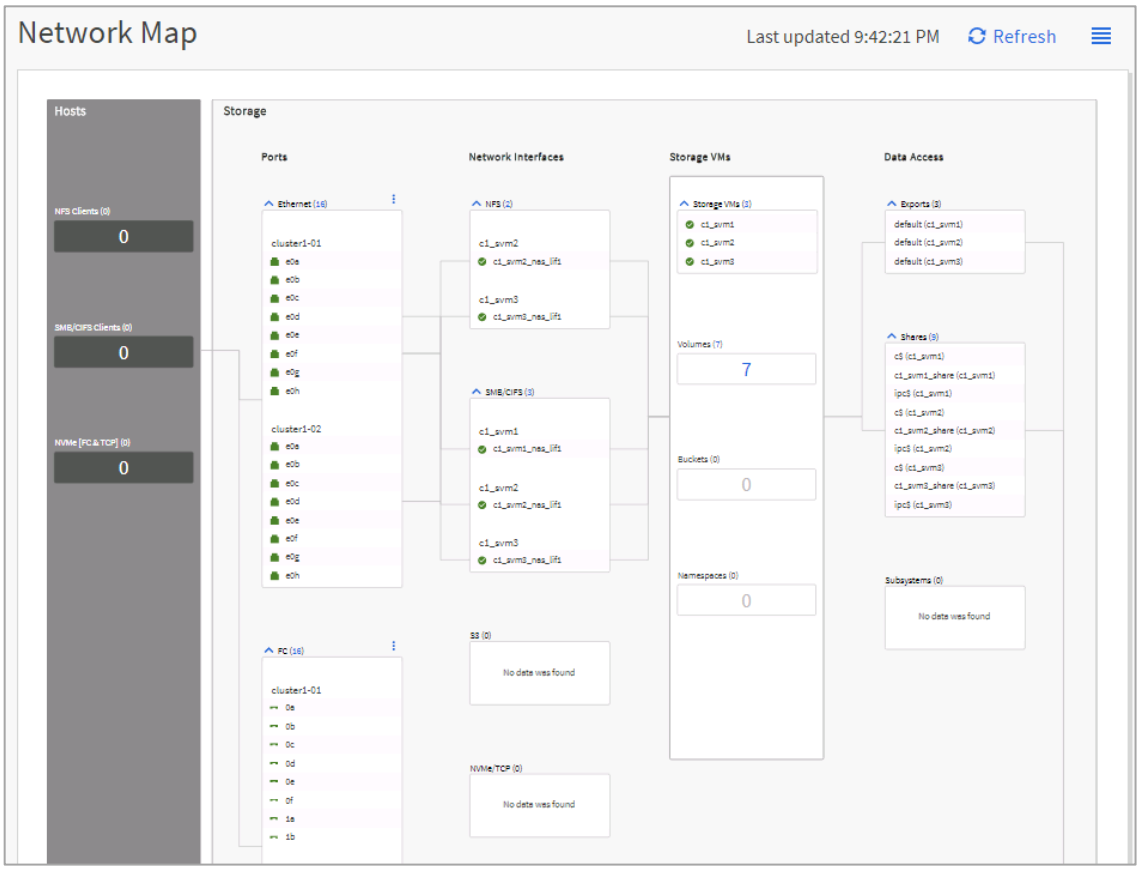
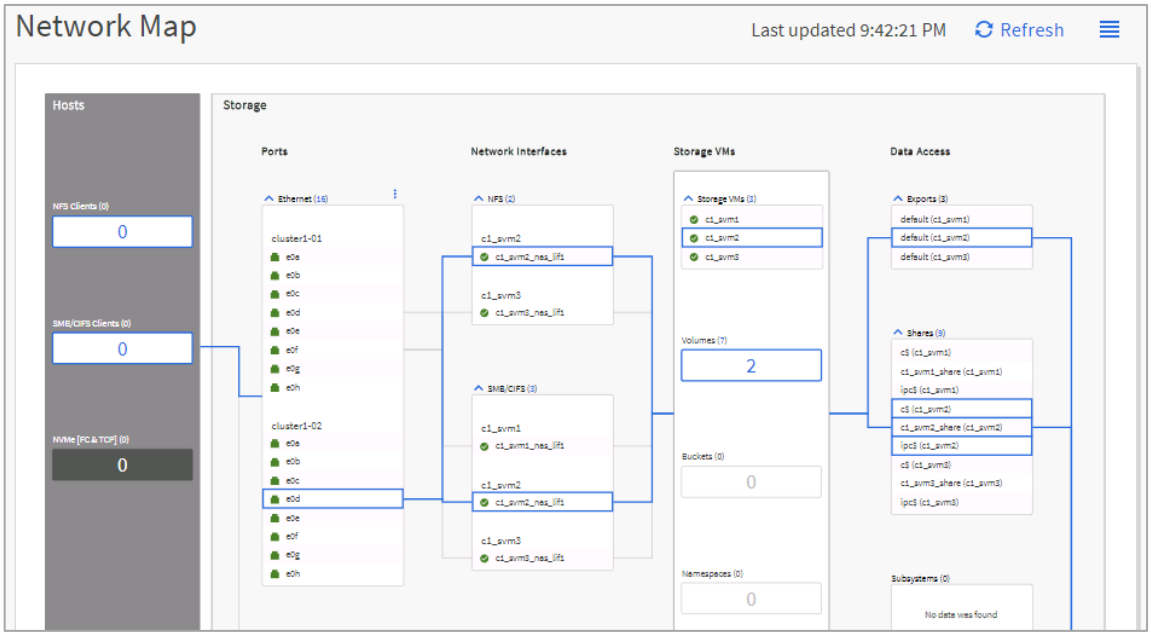
Step	Action
6-18	Review the Storage VMs pane. 
6-19	In the Name column of the Storage VMs page, click **c1_svm2**. 
6-20	On the Storage VMs page, review each pane and answer the following question: Which protocols are enabled for c1_svm2? _____

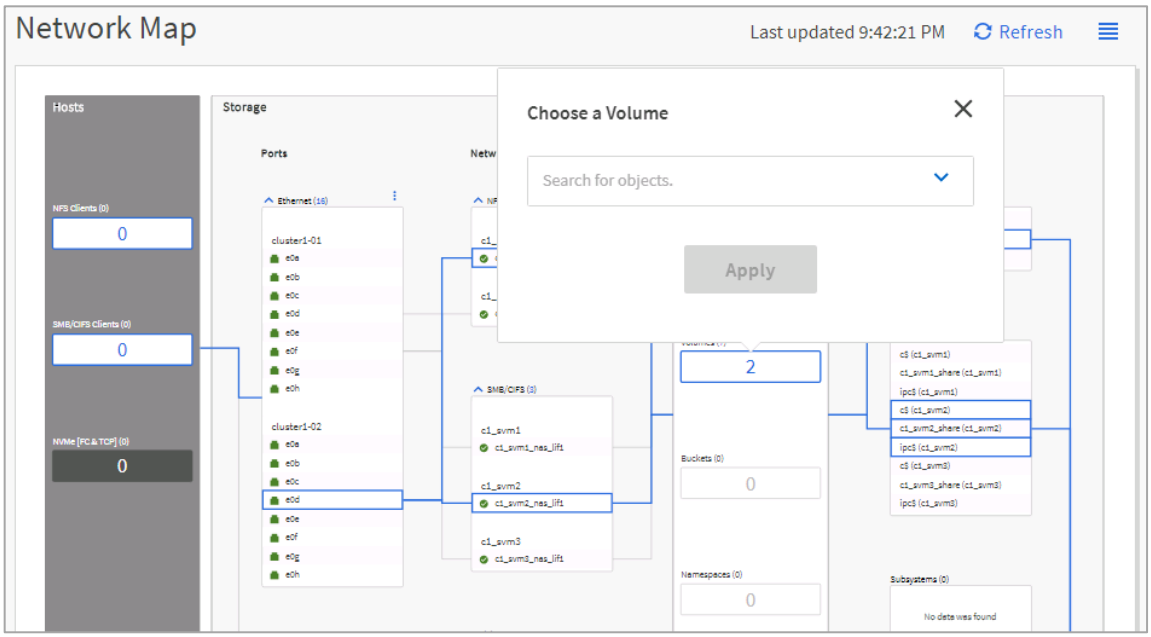
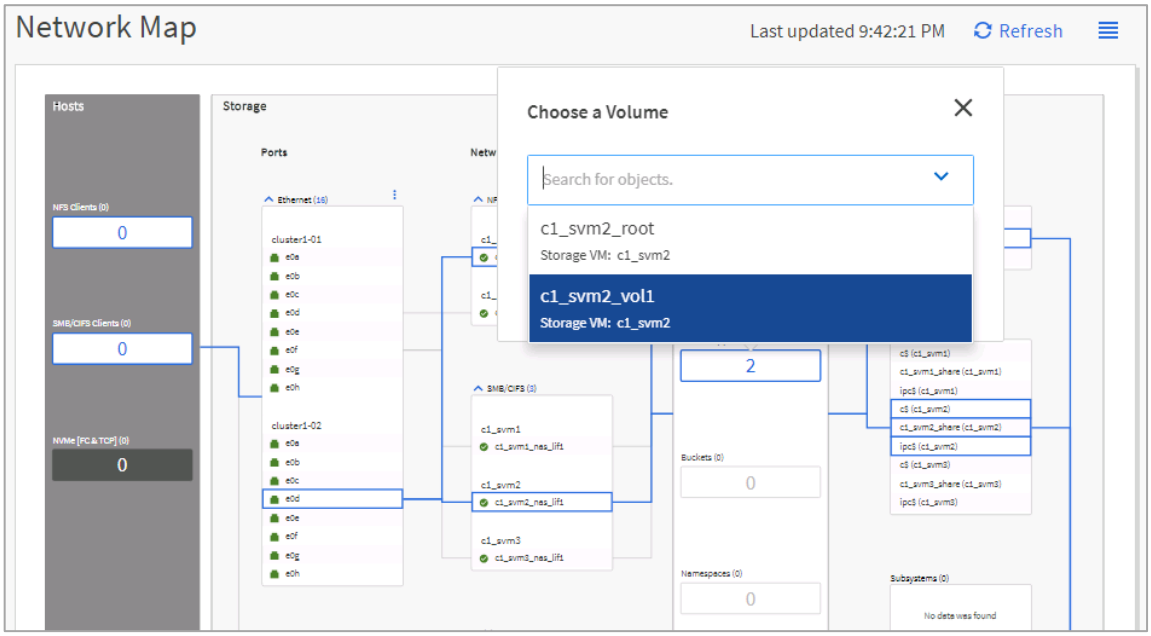
Step	Action
6-21	From the System Manager menu, select **Network > Overview**. 
6-22	Review the Network Interfaces pane. 
6-23	Answer the following question: Which network interfaces belong to c1_svm2? _____

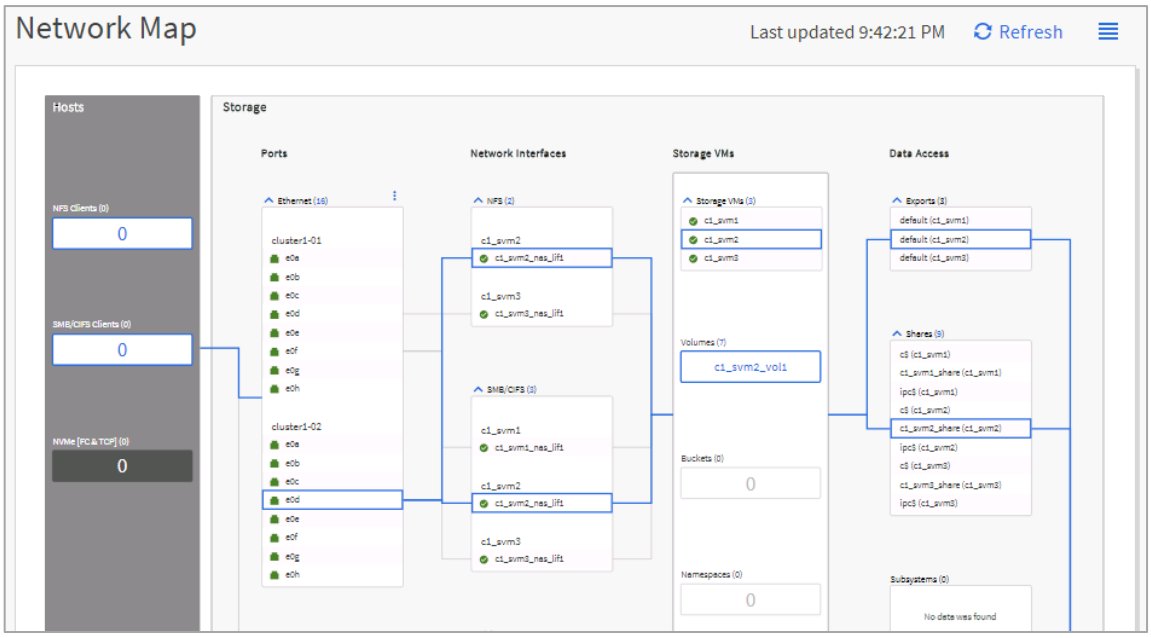
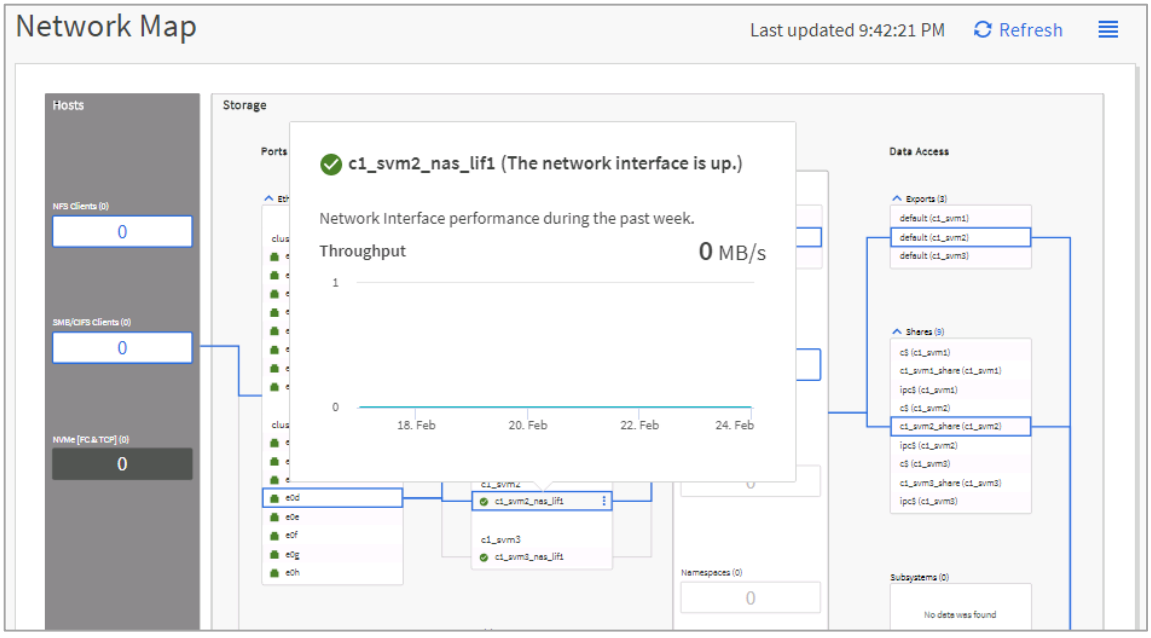
Step	Action
6-24	From the System Manager menu, select **Storage > Tiers**. 
6-25	Review the Tiers page. 
6-26	On the navigation pane, click **Dashboard**.

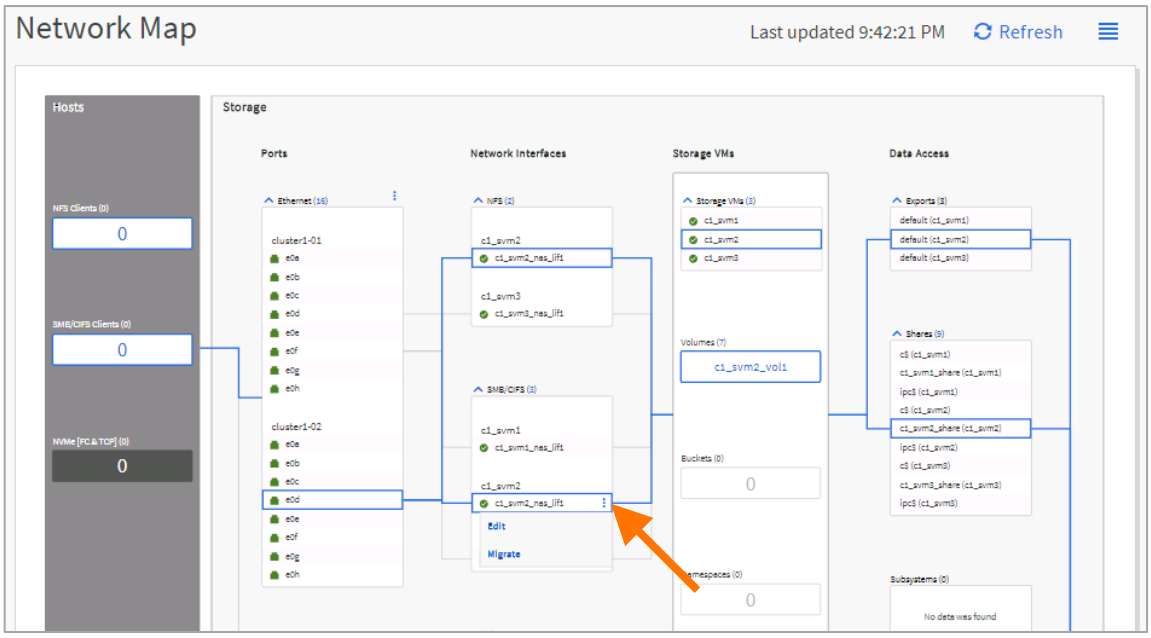
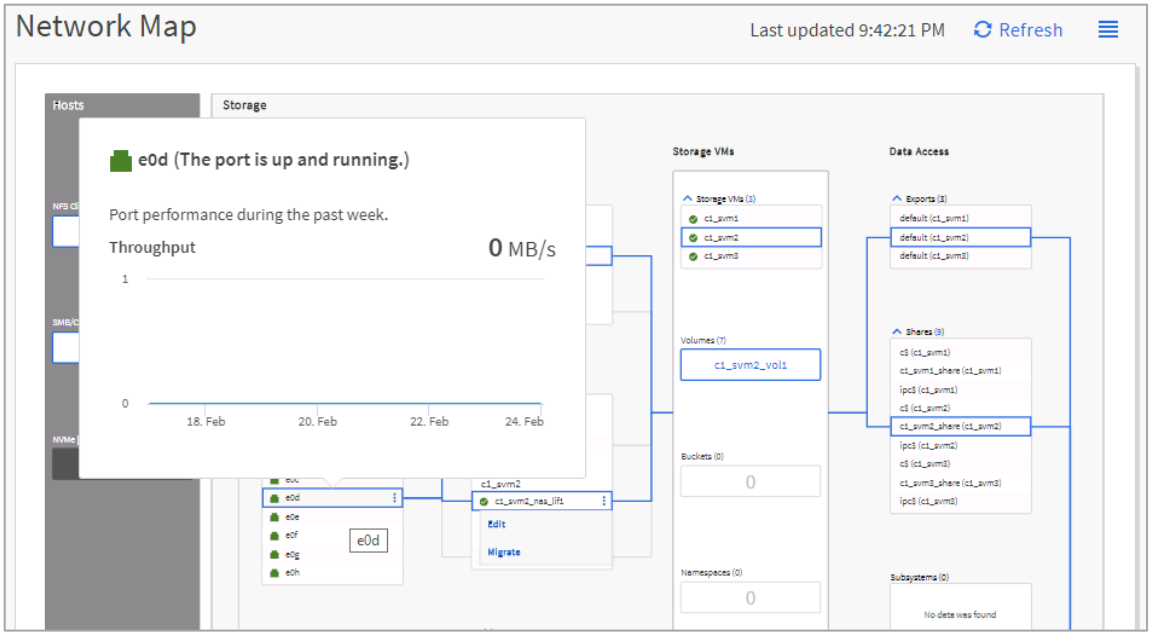
Step	Action
6-27	From the System Manager Dashboard, click the right arrow in the Network pane to navigate to the Network Map page.

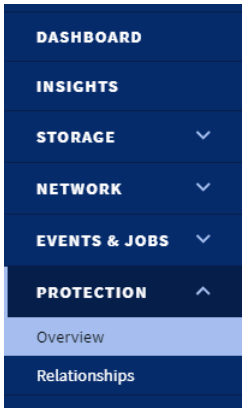
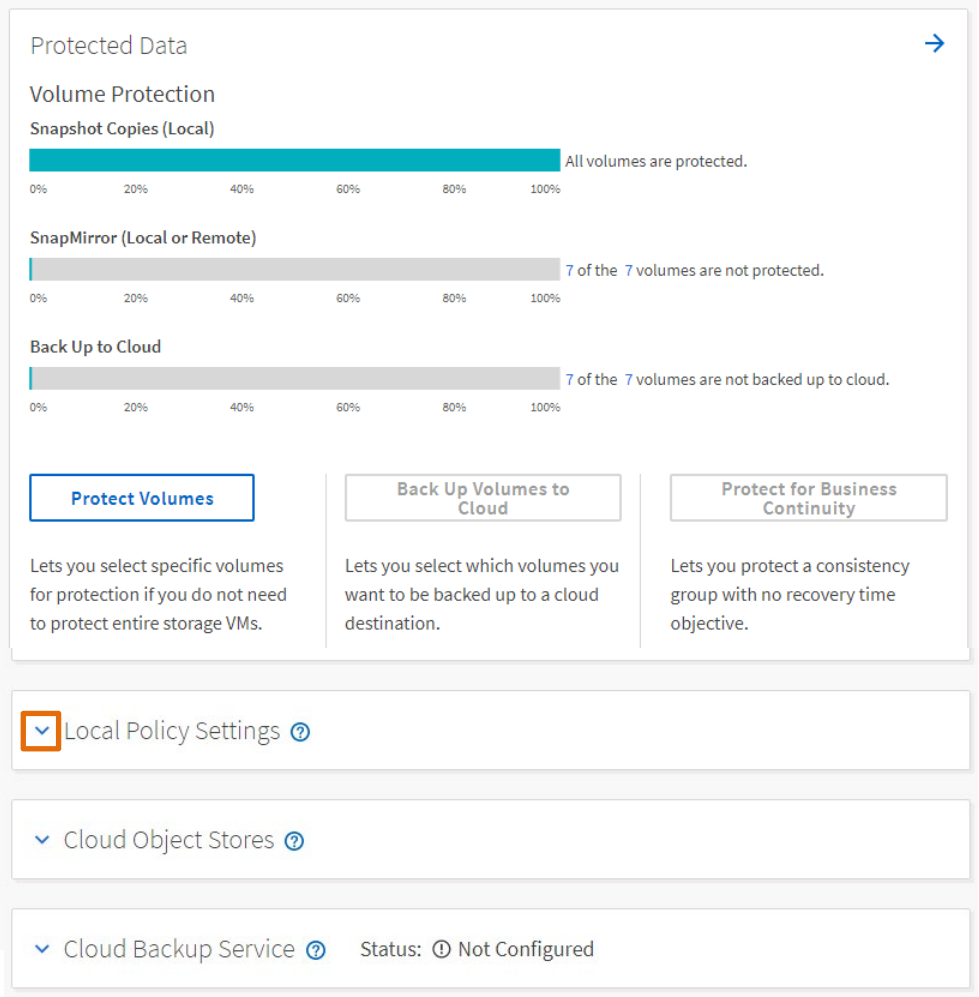


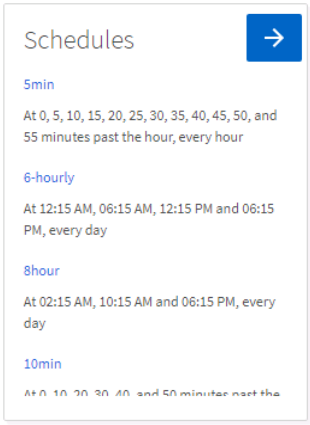
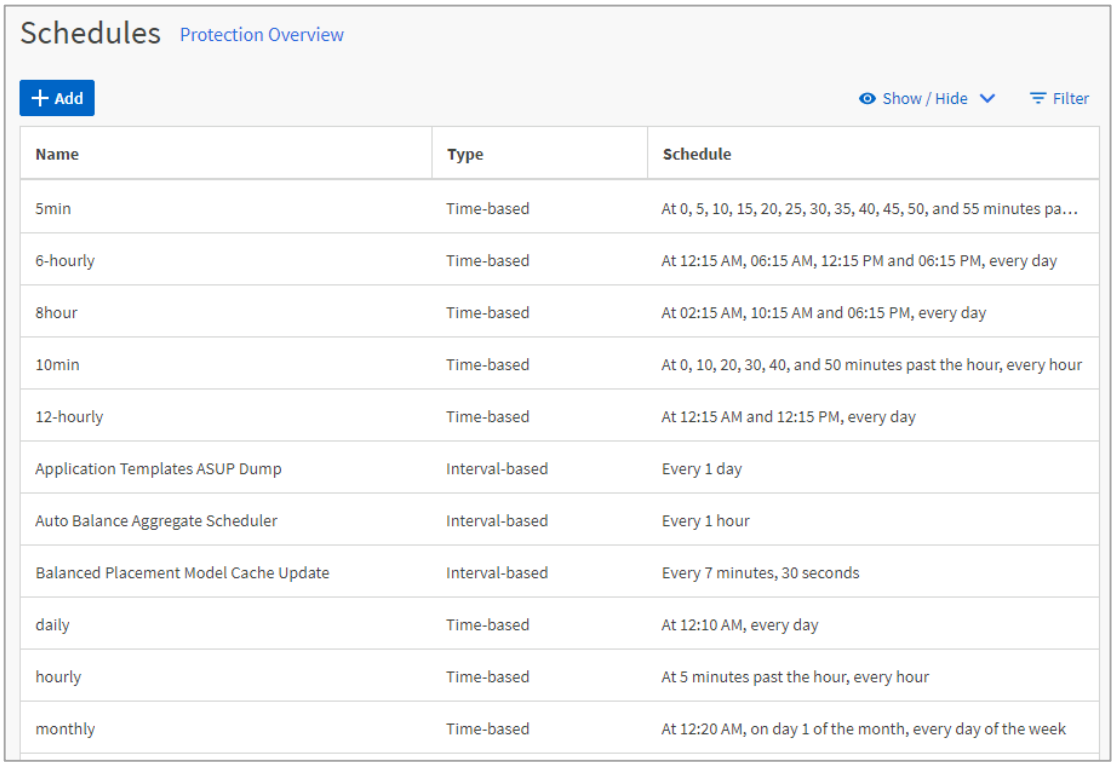
Step	Action
6-28	Review the Network Map page and observe the configured cluster resources. 
6-29	In the Network Map page, click the storage VM **c1_svm2**. Observe that the cluster resources that the storage VM is using are highlighted. 

Step	Action
6-30	While c1_svm2 is selected, click the number "**2**" in the volumes box in the Storage VMs list. 
6-31	Use the menu in the Choose a Volume window to select volume **c1_svm2_vol1**. 
6-32	Click **Apply**.

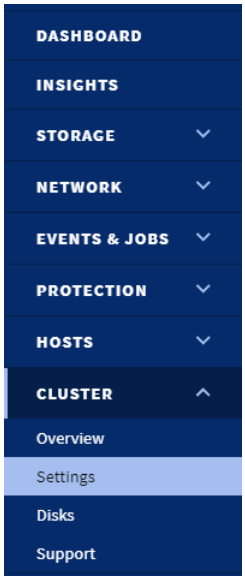
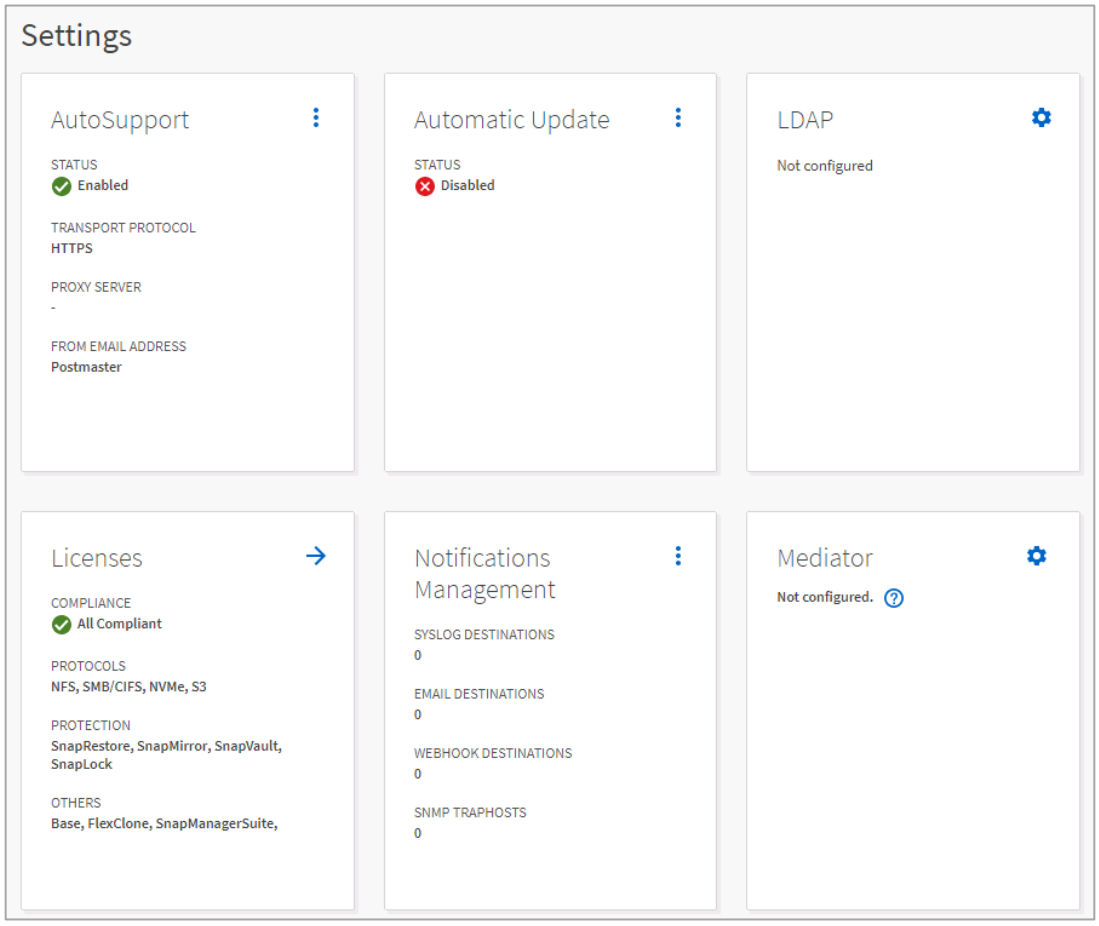
Step	Action
6-33	Observe that the Network Map was updated to highlight only the cluster resources that relate to volume c1_svm2_vol1. 
6-34	Position your cursor over SMB/CIFS LIF **c1_svm2_nas_lif1** and observe the LIF status and throughput. 

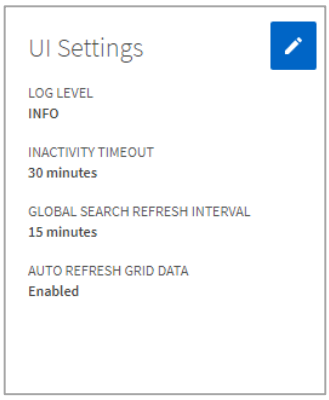
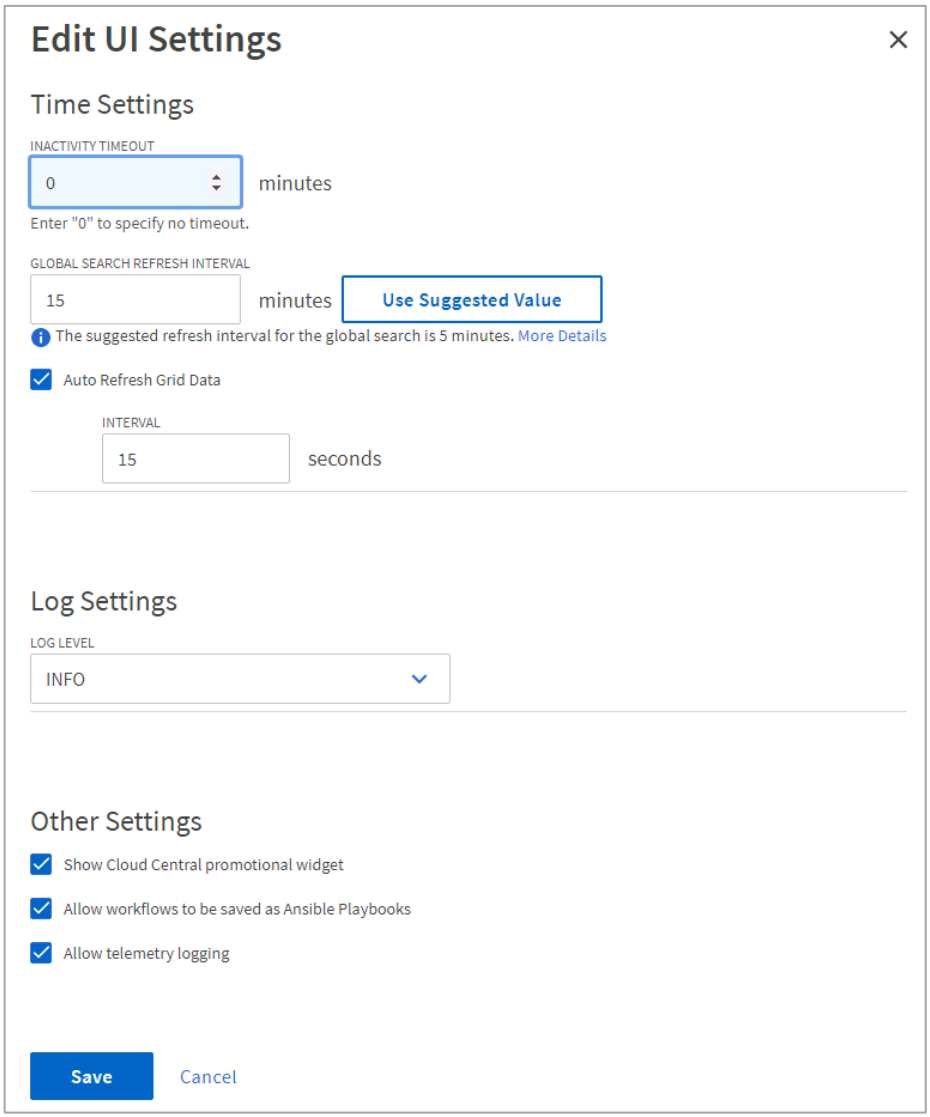
Step	Action
6-35	Click the more menu button for LIF c1_svm2_nas_lif1, and observe that you can edit or migrate the LIF. 
6-36	Position your cursor over network port **e0d** on node cluster1-02, and observe the port status and throughput. 
6-37	From the System Manager menu, explore the remaining selections under **Storage**.

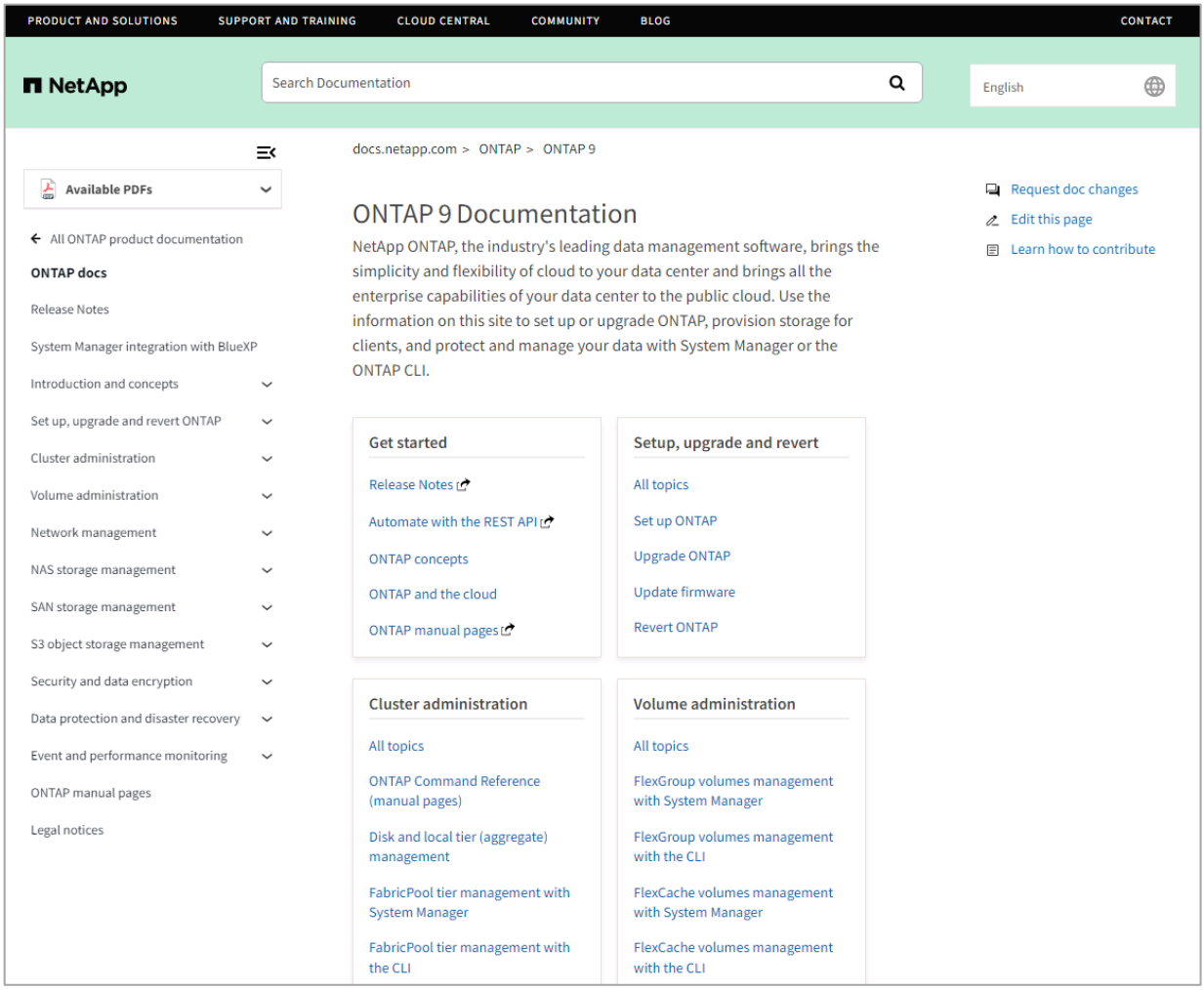
Step	Action
6-38	From the System Manager menu, click **Protection**, and then click **Overview**. 
6-39	In the Overview page, expand the **Local Policy Setting**s panel by clicking the chevron. 

Step	Action
6-40	Click the right arrow in the Schedules pane to navigate to the Schedules page. 
6-41	Review the Schedules page. 

Name	Type	Schedule
5min	Time-based	At 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, and 55 minutes pa…
6-hourly	Time-based	At 12:15 AM, 06:15 AM, 12:15 PM and 06:15 PM, every day
8hour	Time-based	At 02:15 AM, 10:15 AM and 06:15 PM, every day
10min	Time-based	At 0, 10, 20, 30, 40, and 50 minutes past the hour, every hour
12-hourly	Time-based	At 12:15 AM and 12:15 PM, every day
Application Templates ASUP Dump	Interval-based	Every 1 day
Auto Balance Aggregate Scheduler	Interval-based	Every 1 hour
Balanced Placement Model Cache Update	Interval-based	Every 7 minutes, 30 seconds
daily	Time-based	At 12:10 AM, every day
hourly	Time-based	At 5 minutes past the hour, every hour
monthly	Time-based	At 12:20 AM, on day 1 of the month, every day of the week

Step	Action
6-42	From the System Manager menu, select **Cluster > Settings**. 
6-43	Explore each of the panes of the Settings page: 

Step	Action
6-44	In the UI Settings pane, click the pencil (Edit) icon. 
6-45	Disable automatic logout due to inactivity by setting the inactivity timeout to **0** minutes. 
6-46	Disabling automatic logout weakens security and should never be done outside of training environments.

Step	Action
6-47	Click **Save**.
6-48	For help with any System Manager command, on the menu bar, click the Help (“?”) icon: 
6-49	On the menu bar, click **Help**, and then explore the ONTAP System Manager documentation: 

End of exercise