

Module 5: Cloud Manager Management Functionality

Exercise 2: Manage Cloud Volumes ONTAP

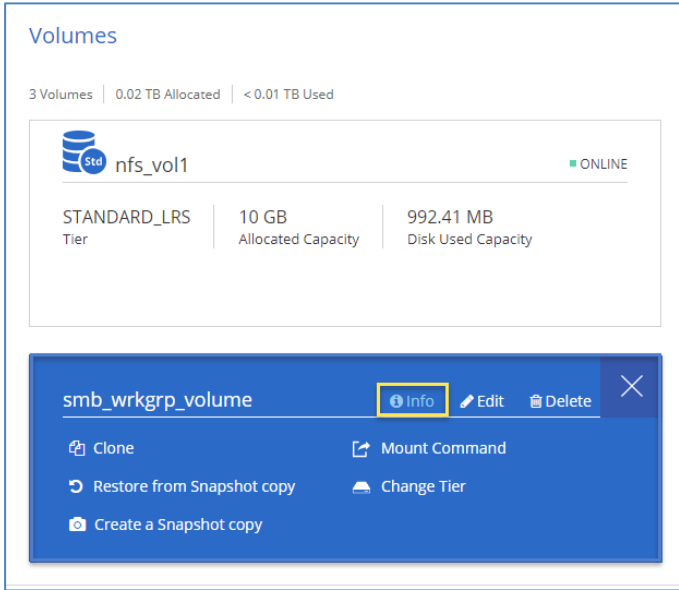
In this exercise, you use Cloud Manager to manage various aspects of a Cloud Volumes ONTAP system, including storage provisioning, modification, and movement. You also use other functions, such as configuring a Network Time Protocol (NTP) server, scheduling a shutdown schedule for Cloud Volumes ONTAP, and using Cloud Manager API commands to administrate Cloud Volumes ONTAP.

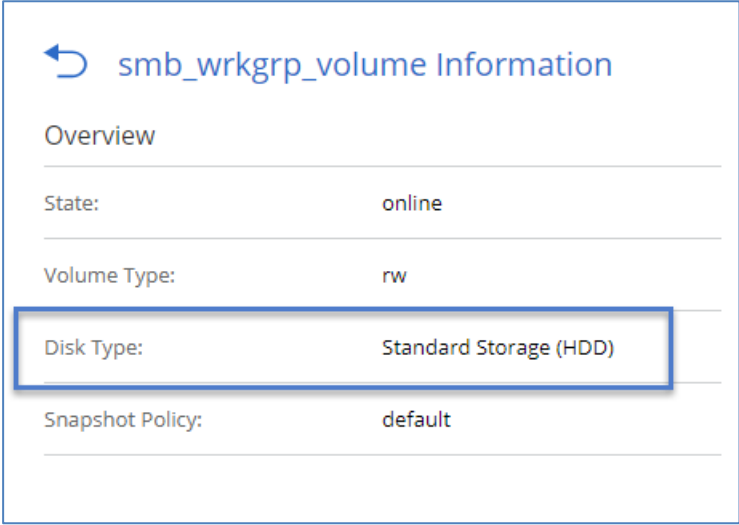
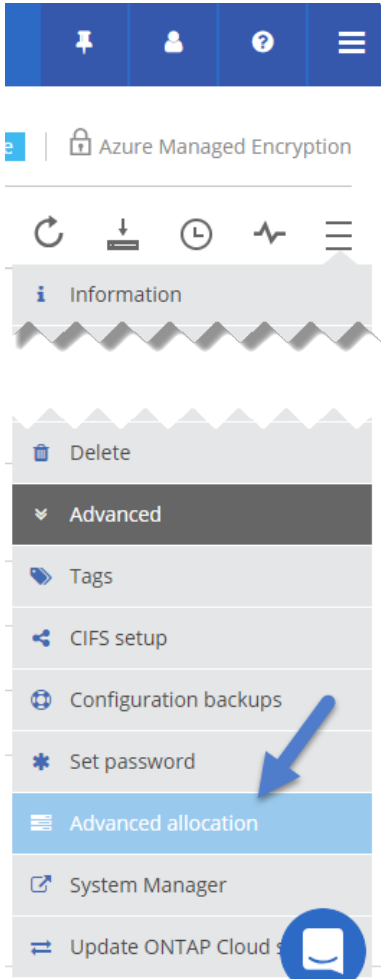
Objectives

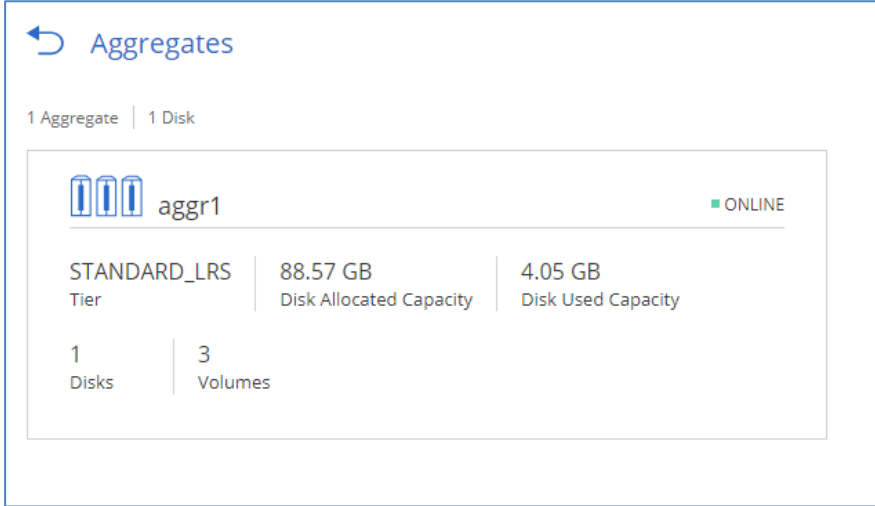
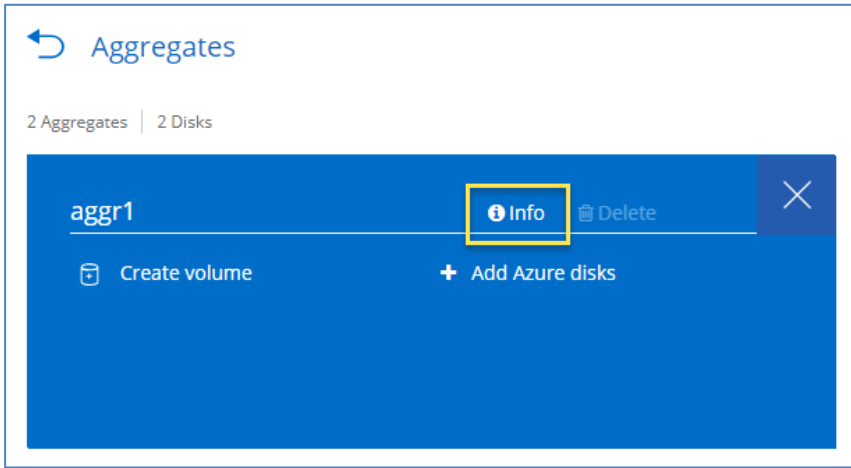
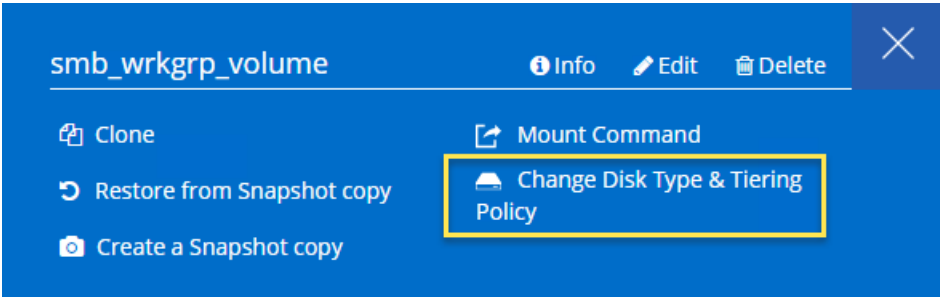
This exercise focuses on enabling you to do the following:








- Change the underlying disk type of a Cloud Volumes ONTAP volume
- Add disks to an aggregate
- Use System Manager to move volumes between aggregates
- Synchronize system time using NTP
- Schedule automatic shutdown of a Cloud Volumes ONTAP instance
- Use Cloud Manager API commands to administer Cloud Volumes ONTAP


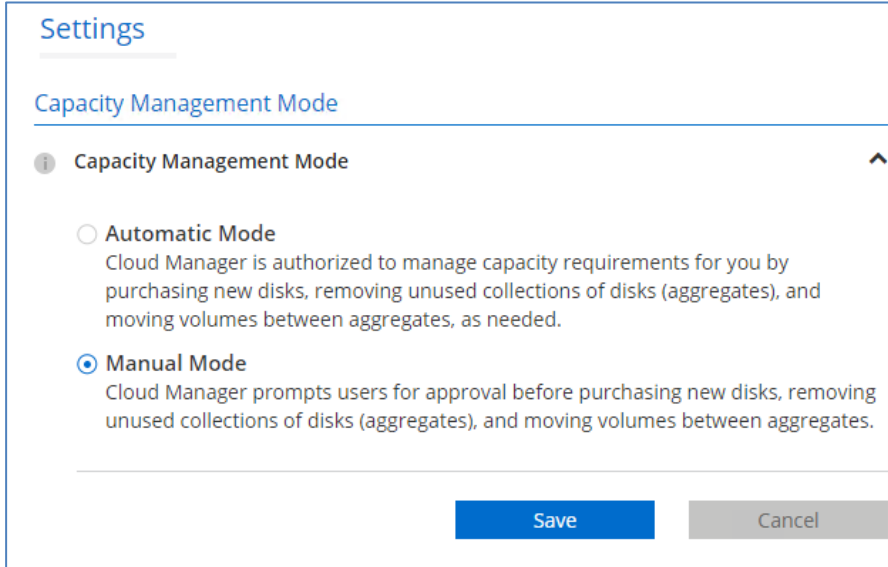
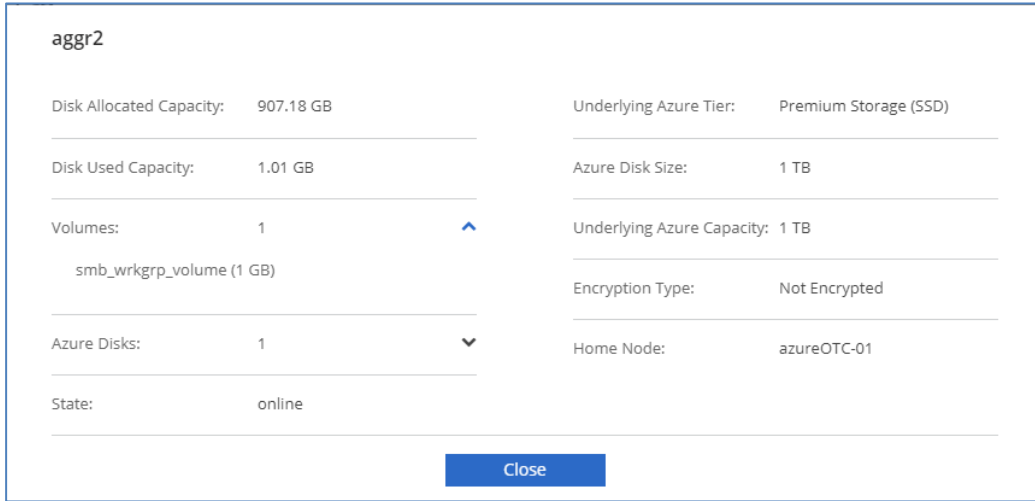
Task 1: Manage Volumes and Aggregates

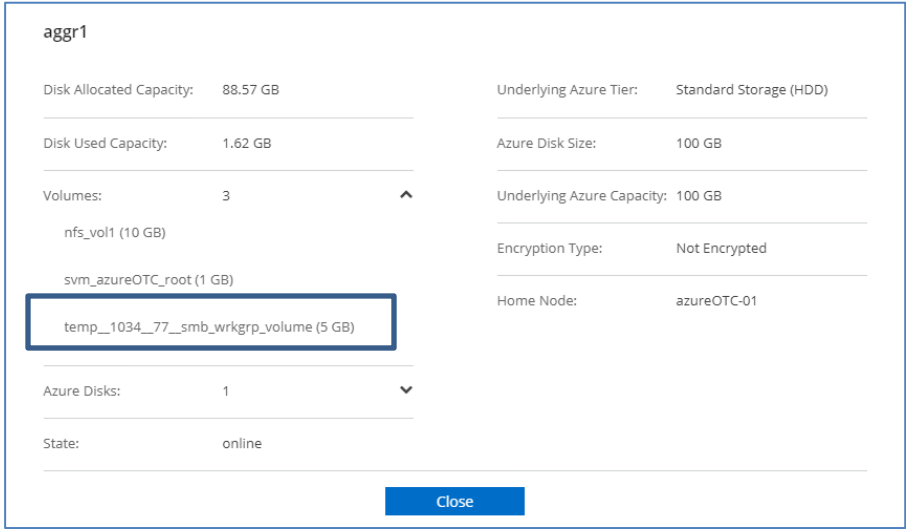
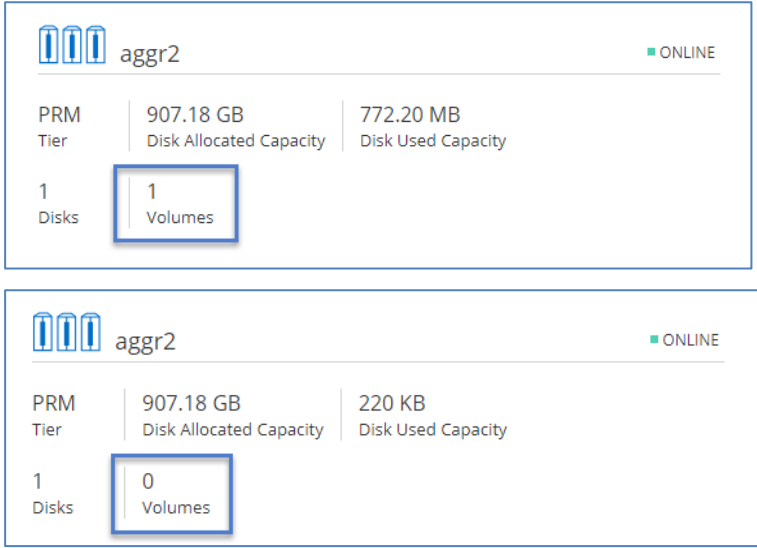

Step	Action
1-1	Return to the Cloud Manager interface.
1-2	<p>In the smb_wrkgrp_volume menu bar, select Info to view the current disk type for the SMB volume.</p> 

Step	Action
1-3	<p>Verify that the underlying disks are currently HDD.</p>  <p>The screenshot shows the 'smb_wrkgrp_volume Information' page. Under the 'Overview' section, the 'Disk Type' is listed as 'Standard Storage (HDD)', which is highlighted with a blue rectangular box. Other details include 'State: online', 'Volume Type: rw', and 'Snapshot Policy: default'.</p>
1-4	<p>In the far right drop-down menu, select Advanced > Advanced allocation to view the current data aggregate.</p>  <p>The screenshot shows the Azure Managed Encryption interface. In the top right corner, there is a blue navigation bar with icons for pin, user, help, and a menu. Below this, the 'Advanced allocation' option is selected in the far right drop-down menu, indicated by a blue arrow. The menu also includes options like 'Delete', 'Advanced', 'Tags', 'CIFS setup', 'Configuration backups', 'Set password', 'System Manager', and 'Update ONTAP Cloud'.</p>

Step	Action
1-5	<p>Verify that there is one aggregate named aggr1 and that it is housing three volumes.</p> 
1-6	<p>In the aggr1 menu bar, select Info.</p> 
1-7	Verify that the Underlying Azure Tier is Standard Storage (HDD).
1-8	Click Close .
1-9	Return to the Volumes tab.
1-10	<p>Select the smb_wrkgrp_volume volume, and then click Change Disk Type & Tiering Policy.</p> 

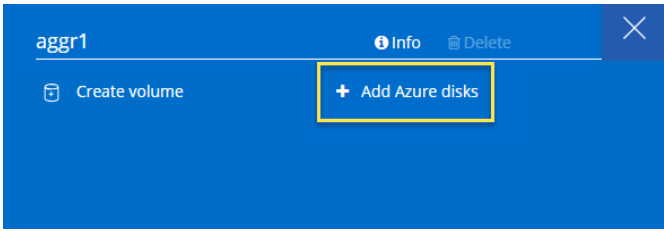
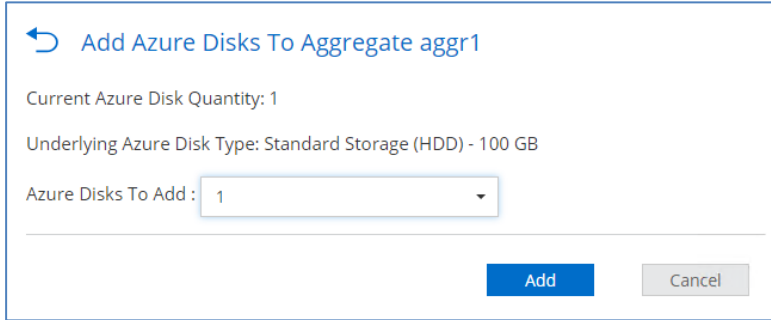
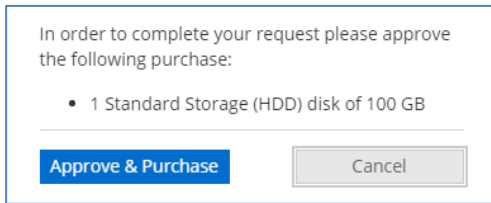
Step	Action
1-11	<p>Select Premium SSD, and click Change.</p> <div data-bbox="300 197 1360 968"> <p>Change Azure Disk Type and Tiering Policy for Volume smb_wrkgrp_volume</p> <p>Current disk type - Standard HDD</p> <div> <div>  <p>Premium SSD</p> </div> <div>  <p>Standard SSD</p> </div> <div>  <p>Standard HDD</p> </div> </div> <p> Tiering data to object storage</p> <p> Volume Tiering Policy Disabled - Cannot create capacity tiered volume on Cloud Volumes ONTAP Explore license</p> <p> Working Environment Blob Storage Tier: Hot</p> <p>Changing the tier impacts cost, performance, and maximum capacity. Refer to Cloud Manager documentation for more details. Note that this action is non-disruptive.</p> <div> Change Cancel </div> </div>
1-12	<div data-bbox="300 997 402 1102">  </div> <p>This option is nondisruptive. A new aggregate is automatically created, and the volume is moved to the new aggregate in the background. This process can take several minutes as the new disks are acquired for the new solid-state drive (SSD) aggregate.</p>

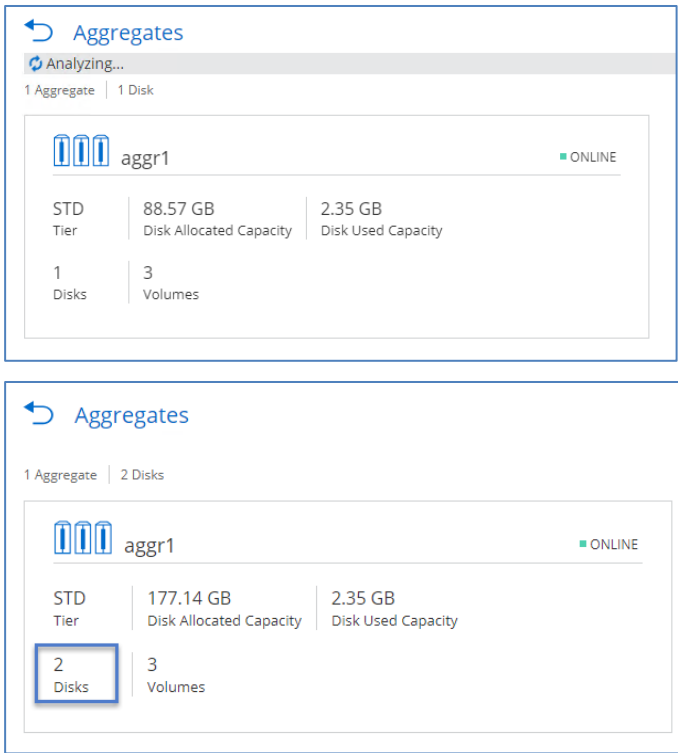

Step	Action
1-13	<div>  <p>In the Cloud Manager settings, set the Capacity Management Mode to Manual Mode if you want to be prompted for approval before the following:</p> <ul style="list-style-type: none"> Purchasing any new disks Removing unused collections of disks (aggregates) Moving volumes between aggregates </div> <div>  <p>The screenshot shows the 'Settings' page with the 'Capacity Management Mode' section. The 'Manual Mode' radio button is selected, indicating that users will be prompted for approval before purchasing new disks, removing unused collections of disks (aggregates), and moving volumes between aggregates. The 'Automatic Mode' option is also visible, which would allow Cloud Manager to manage capacity requirements automatically.</p> </div>
1-14	<p>Return to the Advanced Allocation menu to see that a new aggr2 is created and that the smb_wrkgrp_volume has been moved to this aggregate.</p> <p>(It can take several minutes for the new aggregate to be created.)</p> <div>  <p>The screenshot displays the 'aggr2' Advanced Allocation menu. It shows the following details:</p> <ul style="list-style-type: none"> Disk Allocated Capacity: 907.18 GB Disk Used Capacity: 1.01 GB Volumes: 1 (smb_wrkgrp_volume (1 GB)) Azure Disks: 1 State: online Underlying Azure Tier: Premium Storage (SSD) Azure Disk Size: 1 TB Underlying Azure Capacity: 1 TB Encryption Type: Not Encrypted Home Node: azureOTC-01 </div>
1-15	Change the smb_wrkgrp_volume back to the Standard HDD Tier.

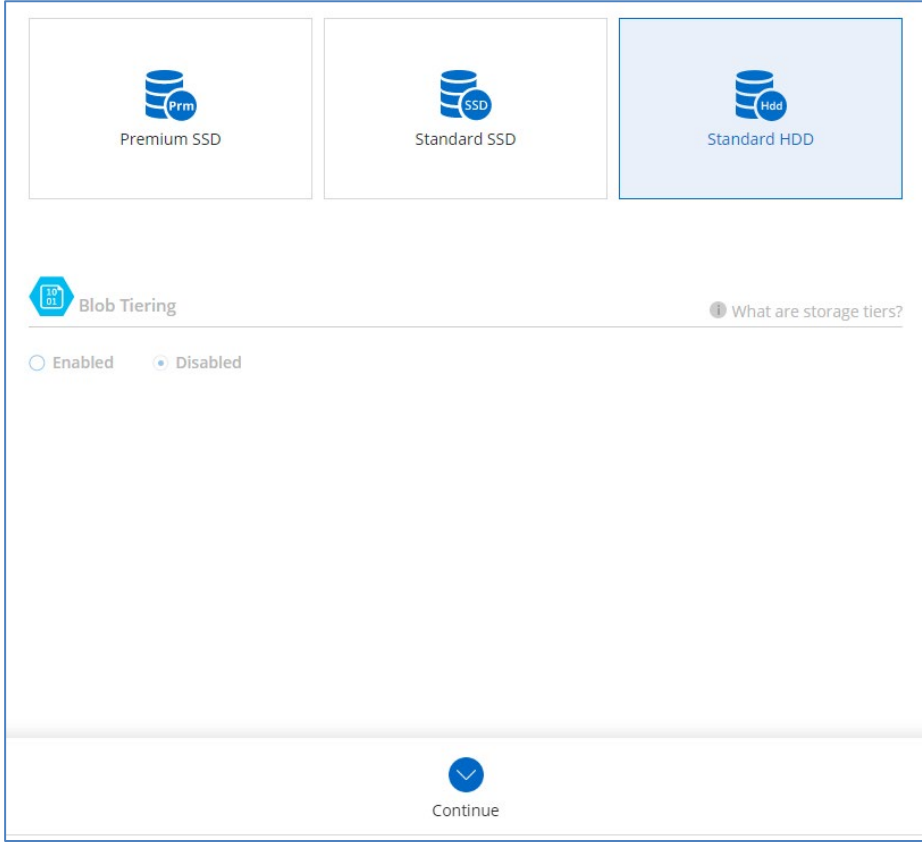
Step	Action
1-16	<p>Return to the aggregate page and view the info for aggr1.</p> <p>Note: You can see a temp volume that is being used to transfer the volume back to HDD storage.</p> 
1-17	<p>Wait for aggr2 to indicate 0 Volumes.</p> 
1-18	 <p>Notice that aggr2 is not automatically deleted.</p>
1-19	<p>Select aggr2, and click Delete.</p>

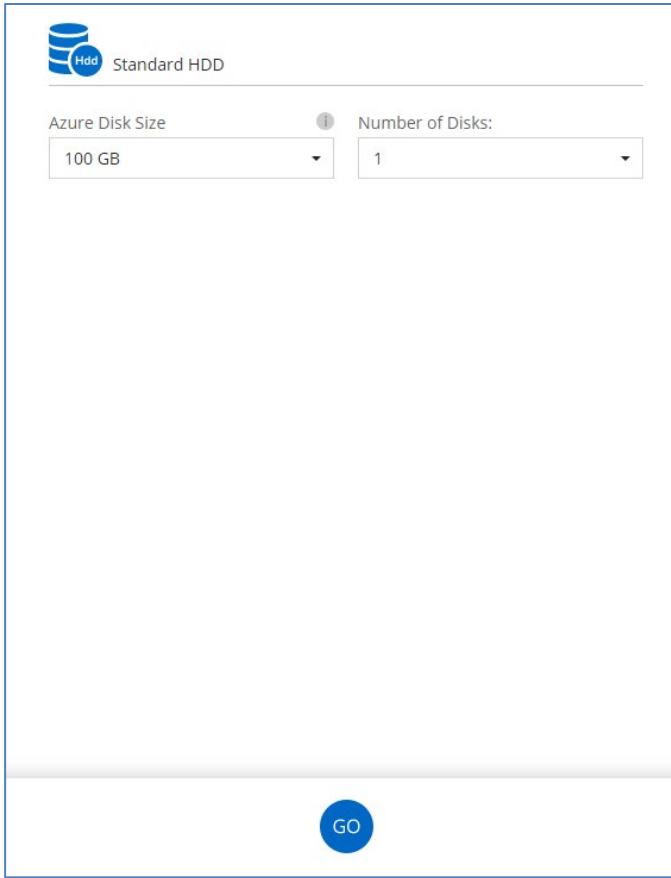
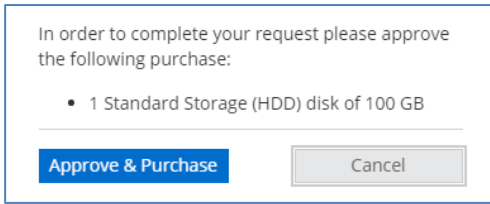
Step	Action
1-20	<p data-bbox="298 149 1273 184">In the “Are you sure you want to delete aggregate aggr2?” dialog box, click Delete.</p> <div data-bbox="298 197 896 472"><p data-bbox="355 224 812 287">Are you sure you want to delete aggregate aggr2?</p><p data-bbox="355 319 677 344">This operation cannot be undone.</p><hr data-bbox="355 386 841 390"/><div data-bbox="358 411 841 453"><div data-bbox="358 411 550 453">Delete</div><div data-bbox="644 411 841 453">Cancel</div></div></div>

Task 2: Add Disks to an Aggregate

Step	Action
2-1	 <p>The screenshot shows a management interface for an aggregate named 'aggr1'. At the top, there are tabs for 'Info' and 'Delete', and a close button (X). Below the tabs, there are two buttons: 'Create volume' and '+ Add Azure disks'. The '+ Add Azure disks' button is highlighted with a yellow rectangular box.</p>
2-2	<p>For the Azure Disks to Add, select 1, and click Add.</p>  <p>The screenshot shows a dialog box titled 'Add Azure Disks To Aggregate aggr1'. It contains the following text: 'Current Azure Disk Quantity: 1' and 'Underlying Azure Disk Type: Standard Storage (HDD) - 100 GB'. Below this, there is a dropdown menu labeled 'Azure Disks To Add' with the value '1' selected. At the bottom right, there are two buttons: 'Add' (highlighted in blue) and 'Cancel' (grayed out).</p>
2-3	<p>In the dialog box, click Approve & Purchase.</p>  <p>The screenshot shows a dialog box with the text: 'In order to complete your request please approve the following purchase:'. Below this, there is a list item: '• 1 Standard Storage (HDD) disk of 100 GB'. At the bottom, there are two buttons: 'Approve & Purchase' (highlighted in blue) and 'Cancel' (grayed out).</p>

Step	Action
2-4	<p>Wait for the Analyzing... prompt to disappear, and verify that you now have two disks in the aggregate. It might take several minutes for the disk to be added and displayed.</p> 
2-5	 <p>After you add a disk to an aggregate, the disk cannot be removed from the aggregate. The aggregate must be destroyed to remove disks from the aggregate. In the next exercise, you move volumes from one aggregate to another. This method reduces aggregate size by moving the volumes to a smaller aggregate and then deleting the larger aggregate.</p>
2-6	Click Add Aggregate .
2-7	In the Aggregate Details page, enter the Aggregate name aggr2 , and click Continue .

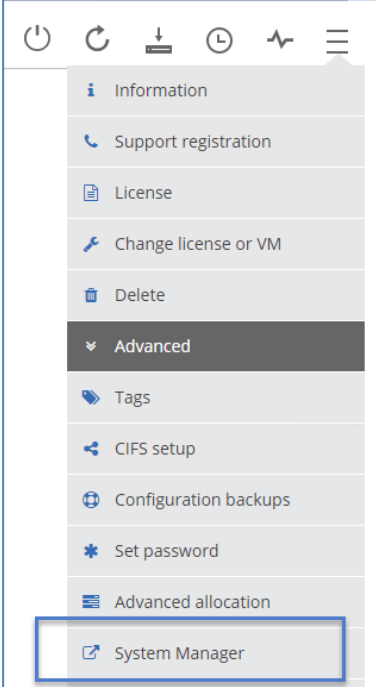
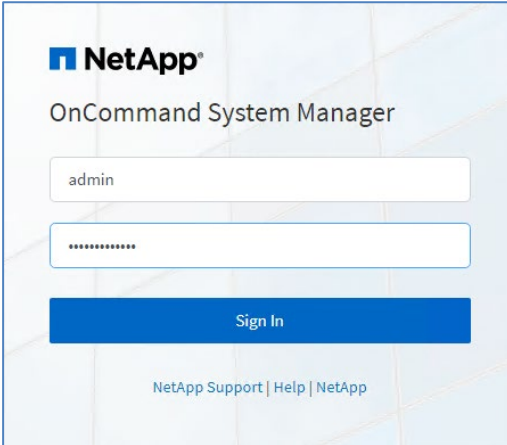
Step	Action
2-8	<p data-bbox="298 149 1143 180">In the Aggregate Tier page, select Standard HDD, and click Continue.</p> <div data-bbox="298 197 1214 1033">  <p>The screenshot displays the 'Aggregate Tier' configuration page. At the top, there are three storage tier options, each represented by a disk icon and a label: 'Premium SSD' (with a 'Prm' icon), 'Standard SSD' (with an 'SSD' icon), and 'Standard HDD' (with an 'Hdd' icon). The 'Standard HDD' option is selected, indicated by a blue border and a light blue background. Below these options is a 'Blob Tiering' section, which includes a toggle switch currently set to 'Disabled'. To the right of the toggle is a link that says 'What are storage tiers?'. At the bottom of the page, there is a 'Continue' button with a blue checkmark icon.</p> </div>

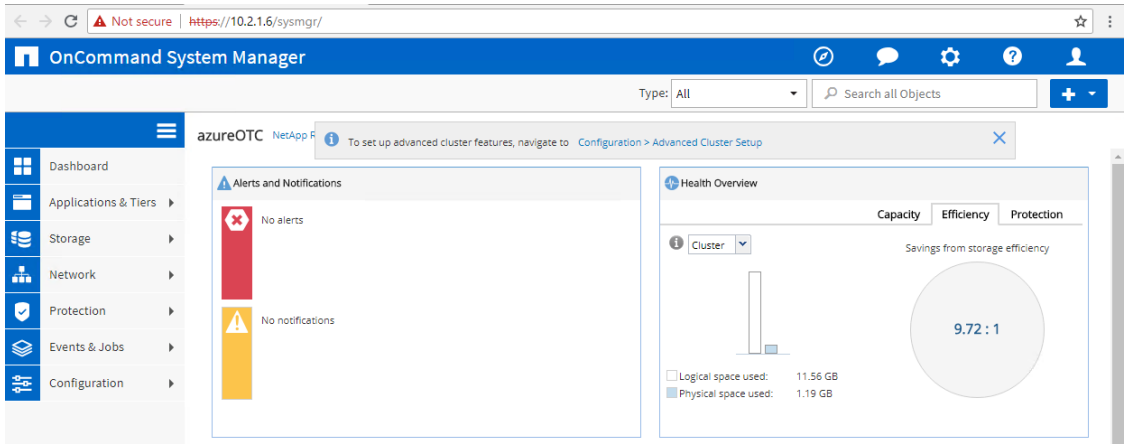
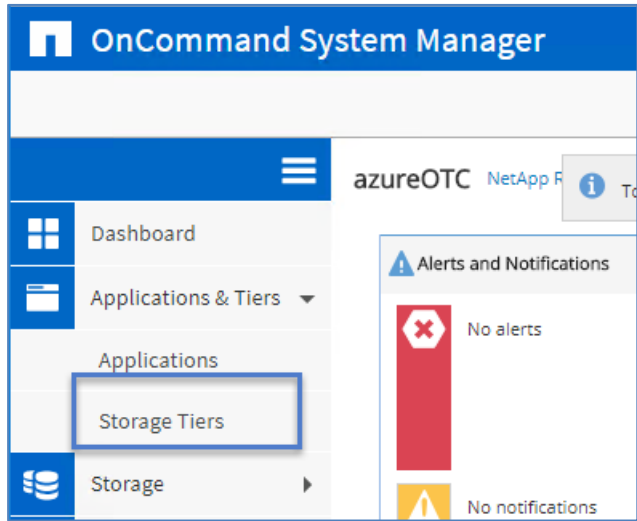
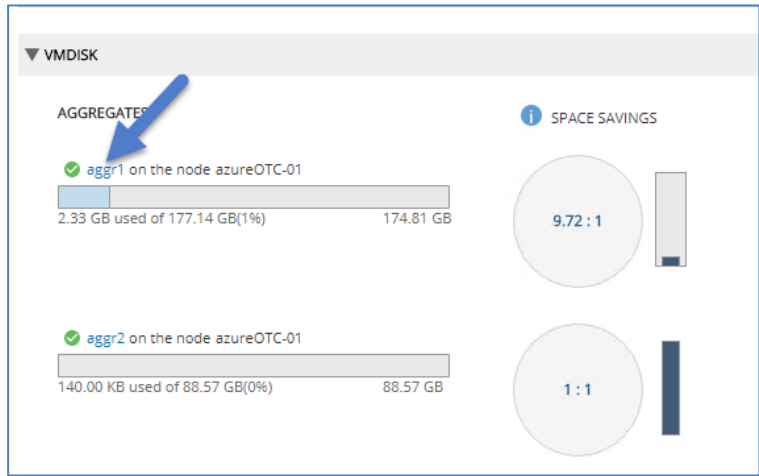
Step	Action
2-9	<p>In the Aggregate Disks page, for the Azure Disk Size, select 100 GB, and for the Number of Disks, select 1.</p> 
2-10	Click GO .
2-11	<p>In the dialog box, click Approve & Purchase.</p> 
2-12	Verify that aggr2 is created.

Task 3: Move Volumes Using System Manager

In this task, you move all your volumes from aggr1 to aggr2, and then you delete aggr1.

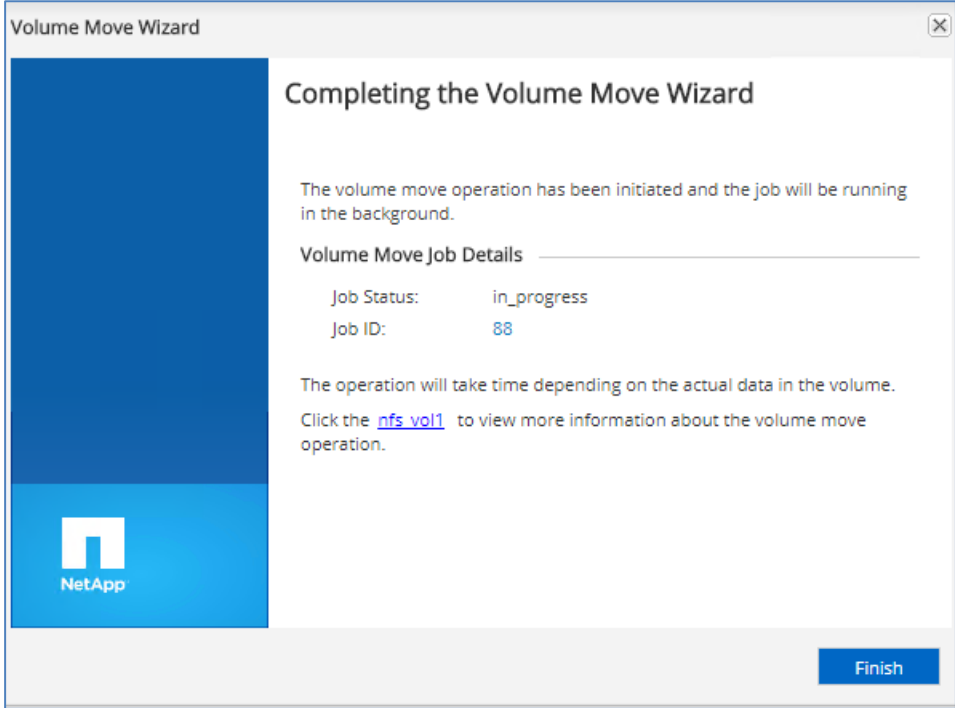
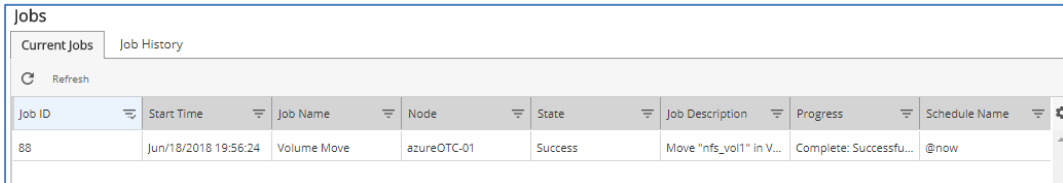
Step	Action
3-1	Return to your W2K16-jumphost Windows Server.
3-2	Connect to Cloud Manager from the web browser on the Windows Server. (Chrome or Firefox is recommended)

Step	Action
3-3	<p>In the working environment, click the menu icon, and then click Advanced > System Manager.</p> 
3-4	<p>In the Launch System Manager dialog box, click Launch.</p>
3-5	<p>Ignore any security warnings (the appearance is different depending on the browser that you are using).</p>
3-6	<p>In the OnCommand System Manager login page, enter the following:</p> <ul style="list-style-type: none"> For User name, enter admin. For Password, enter HappyCloud123. 


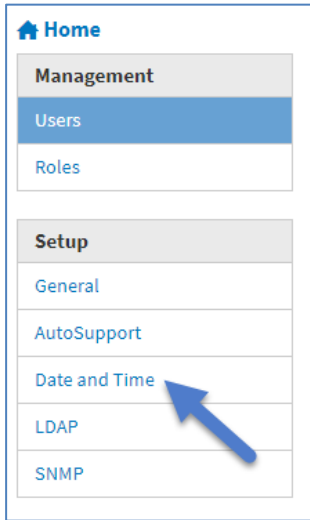
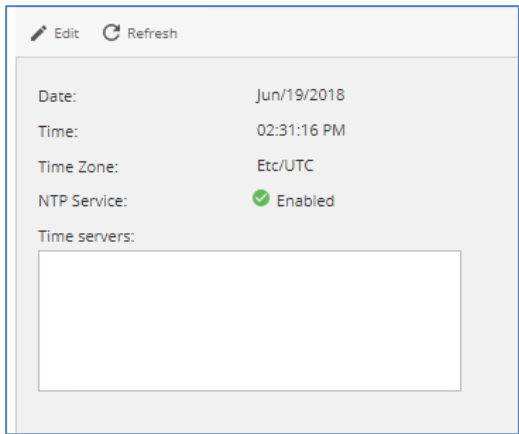
Step	Action
3-7	<p>Verify that the dashboard appears.</p> 
3-8	<p>In the left navigation pane, select Applications & Tiers > Storage Tiers.</p> 
3-9	<p>In the VMDISK section, click aggr1.</p> 

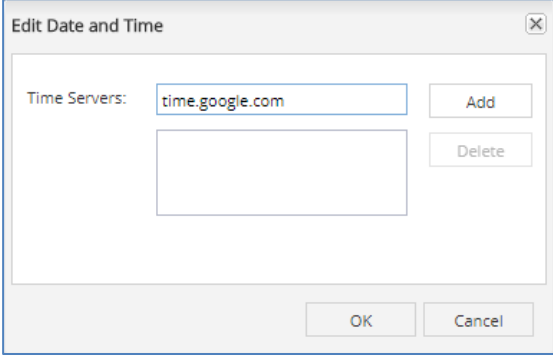

Step	Action												
3-10	<p>In the <code>aggr1</code> page, select More Actions > Volume Move.</p> <div><div><div>Storage Tiers</div><div>Aggregate: <code>aggr1</code></div><div><div>< Back to storage tiers</div><div>More Actions</div><div>Edit</div><div>X</div></div><div><div>Overview</div><div>Disk Information</div><div>Volumes</div><div>Performance</div></div><div><div>Status</div><div>online</div></div><div><div>Node</div><div>azureOTC-01</div></div><div><div>RAID Configuration</div><div>raid0 (Data RAID group size of 12 disks)</div></div></div><div><div>Status</div><div>Add Capacity</div><div>Add Cache</div><div>Mirror</div><div>Volume Move</div><div>Attach External Capacity Tier</div></div></div>												
3-11	<p>In the Welcome to Volume Move Wizard page, click Next.</p> <div><div>Volume Move Wizard</div><div><div>Welcome to Volume Move Wizard</div><div>This wizard will help you choose the volume to move non-disruptively from this aggregate to the destination aggregate.</div><div><div>NetApp</div><div>Back</div><div>Next</div><div>Cancel</div></div></div></div>												
3-12	<p>In the Source Volume page, select the <code>nfs_vol1</code> row, and then click Next.</p> <div><div>Volume Move Wizard</div><div><div>Source Volume</div><div>Select the volume to move from 'aggr1'.</div><div><table><thead><tr><th>Volume Name</th><th>Total Committed Space</th><th>Storage Virtual Machine</th></tr></thead><tbody><tr><td><code>nfs_vol1</code></td><td>464.11 MB</td><td>svm_azureOTC</td></tr><tr><td><code>smb_wrkgrp_volume</code></td><td>977.72 MB</td><td>svm_azureOTC</td></tr><tr><td><code>svm_azureOTC_root</code></td><td>1 GB</td><td>svm_azureOTC</td></tr></tbody></table><div><div>Details</div><div>Source Aggregate: <code>aggr1</code></div><div>Aggregate Storage Type: <code>VMDISK</code></div><div>Selected Volume: <code>nfs_vol1</code></div></div><div><div>Back</div><div>Next</div><div>Cancel</div></div></div></div></div>	Volume Name	Total Committed Space	Storage Virtual Machine	<code>nfs_vol1</code>	464.11 MB	svm_azureOTC	<code>smb_wrkgrp_volume</code>	977.72 MB	svm_azureOTC	<code>svm_azureOTC_root</code>	1 GB	svm_azureOTC
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Step	Action														
3-13	<p>In the Destination Aggregate page, select aggr2, leave all other values as the defaults, and click Next.</p> <div><div>Volume Move Wizard</div><div><div>Destination Aggregate</div><div>Select the destination to move the selected volume non-disruptively. Following list shows all the eligible aggregates that have enough space to accommodate the volume.</div><table><thead><tr><th>Name</th><th>Available Space</th><th>Storage Type</th><th>FabricPool</th></tr></thead><tbody><tr><td>aggr2</td><td>88.57 GB</td><td>VMDISK</td><td>No</td></tr></tbody></table><div>Tiering Policy: <div>snapshot-only</div></div><div>Tell me more about external capacity tier and tiering policies.</div><div>Details</div><div><div>Destination Aggregate:</div><div>aggr2</div><div>Total committed space for the selected volume:</div><div>464.11 MB</div><div>Destination Aggregate Space</div><table><tbody><tr><td>Data</td><td>Available Before Move: 174.81 GB</td><td>Available After Move: 88.12 GB</td></tr><tr><td>Capacity Tier</td><td>Used Before Move: -NA-</td><td>Used After Move: -NA-</td></tr></tbody></table><div>Know more about the changes in volume settings on the destination aggregate.</div></div><div><div>Back</div><div>Next</div><div>Cancel</div></div></div></div>	Name	Available Space	Storage Type	FabricPool	aggr2	88.57 GB	VMDISK	No	Data	Available Before Move: 174.81 GB	Available After Move: 88.12 GB	Capacity Tier	Used Before Move: -NA-	Used After Move: -NA-
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Capacity Tier	Used Before Move: -NA-	Used After Move: -NA-													
3-14	<p>In the Summary page, review the details, and click Next.</p> <div><div>Volume Move Wizard</div><div><div>Summary</div><div>Please review this summary before moving the selected volume.</div><div><div>Selected Volume:</div><div>nfs_vol1</div><div>Source Aggregate:</div><div>aggr1</div><div>Destination Aggregate:</div><div>aggr2</div><div>Source Storage Type:</div><div>VMDISK</div><div>Destination Storage Type:</div><div>VMDISK</div><div>Free Space before Move Operation</div><div><div>Aggregate 'aggr1': 174.81 GB</div><div>Aggregate 'aggr2': 88.57 GB</div></div><div>Free Space after Move Operation</div><div><div>Aggregate 'aggr1': 175.27 GB</div><div>Aggregate 'aggr2': 88.12 GB</div></div></div><div><div>Back</div><div>Next</div><div>Cancel</div></div></div></div>														

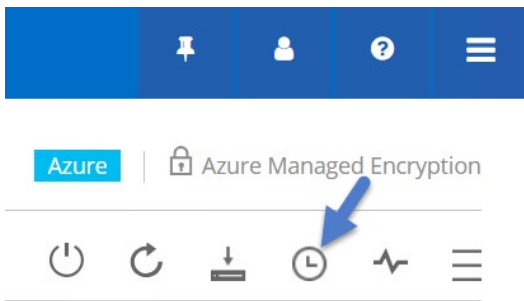
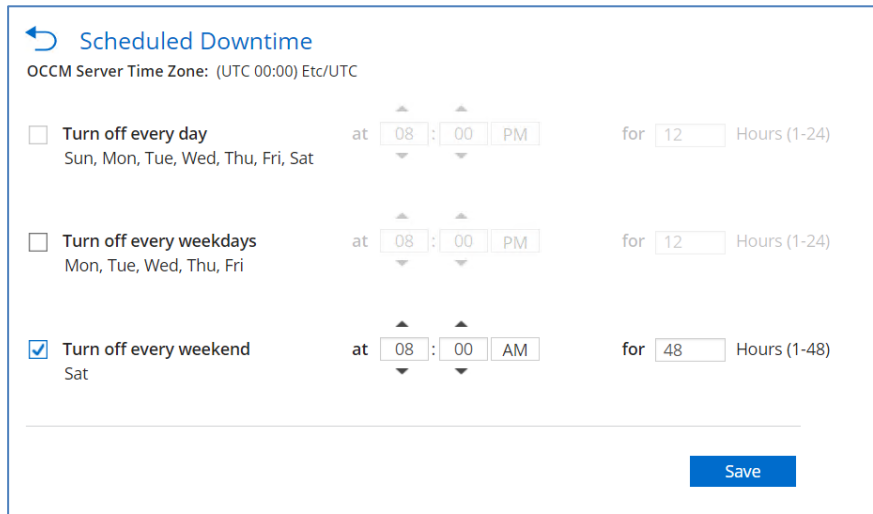


Step	Action
3-15	<p>Record the Job ID: _____</p> 
3-16	Click Finish .
3-17	In the left Navigation pane, select Events & Jobs > Jobs .
3-18	<p>Verify that the job ID for the Volume Move is Completed Successfully.</p> 
3-19	Repeat the Volume Move Wizard for volumes smb_wrkgrp_volume and svm_azureCVO_root.
3-20	Return to Cloud Manager, and delete aggr1.

Task 4: Synchronize the System Time Using NTP

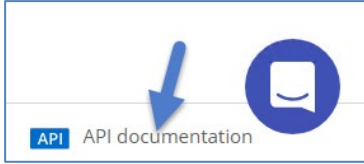


Step	Action
4-1	Return to the System Manager tab in the browser.
4-2	<p>In the System Manager toolbar, click the settings icon.</p> 
4-3	<p>In the left panel, click Date and Time.</p> 
4-4	<p>Click Edit.</p> 

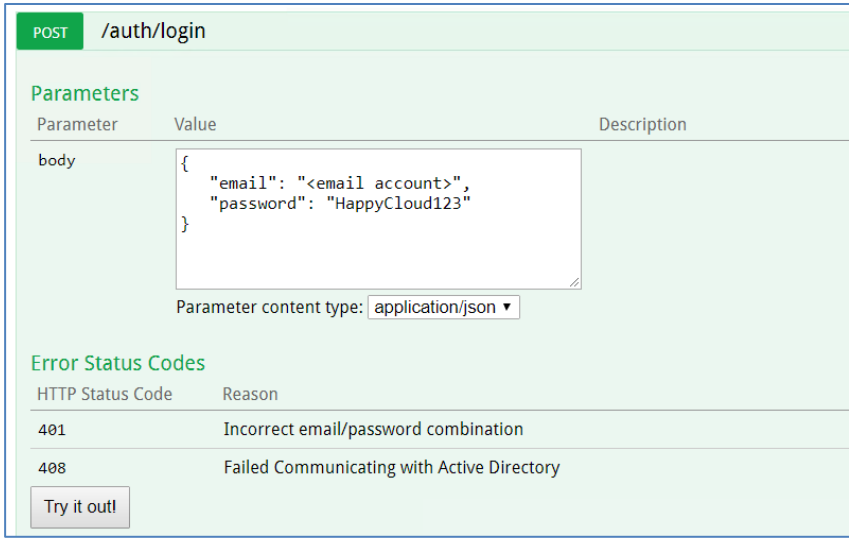


Step	Action
4-5	<p>For the Time Server, enter time.google.com, and then click Add.</p> 
4-6	Click OK .
4-7	To see the new time server, click Refresh .
4-8	 <p>You used the google NTP server because there is no dedicated NTP server for the class. Typically, a customer environment in Azure could use a domain controller in which the NTP server functionality is enabled or have a dedicated NTP server. The only requirement is that the NTP server is reachable from the Cloud Volumes ONTAP system.</p>

Task 5: Schedule Automatic Shutdown of a Cloud Volumes ONTAP Instance

Step	Action
5-1	Return to the Cloud Manager tab in the browser.
5-2	<p>In the working environment, click the schedule downtime icon.</p> 
5-3	<p>In the Schedule Downtime window, select the Turn off every weekend checkbox, leave the other values as the defaults, and then click Save.</p> 
5-4	<p> This arrangement is for a scenario in which there is no activity needed on the Cloud Volumes ONTAP system during the weekend. Another possibility is one in which Cloud Volumes ONTAP is used as a backup system with backups that are scheduled for only the weekend. In that situation, you use the “Turn off every weekdays” setting.</p>
5-5	<p>Verify that the Schedule Downtime icon now has a check mark on it.</p> 

Task 6: Use Swagger to Send API Commands to Cloud Manager

Step	Action
6-1	Return to the Cloud Manager tab in the browser.
6-2	<p>At the bottom-right of the page, click API documentation.</p> 
6-3	A new tab opens in the browser with the API Documentation. Wait for the page to populate. It might take several minutes.
6-4	<p>Click User management operations.</p> 
6-5	Select auth > /auth/login .
6-6	 <p>The authorization API needs to be run before any other API. This API logs you in to Cloud Manager. If the authorization API is not run first, you get an authentication error in any other API that you later use.</p>

Step	Action
6-7	<p>Enter the value as shown in the illustration, replacing <email account> with the email account and password that you use to log in to Cloud Manager.</p>  <p style="text-align: right;">H</p>
6-8	Click Try it out!
6-9	<p>Verify that the response code is 204.</p> 
6-10	 <p>HTTP Status Code 204: The server has successfully fulfilled the request and there is no additional content to send in the response payload body.</p>

Step	Action															
6-11	<p>Select Working environment operations > working-environments > GET /working-environments.</p> <div><p>Working environment operations</p><p>working-environments : Common working environment operations</p><div>Show/Hide List Operations Expand Operations Raw</div><table><tr><td>GET</td><td>/working-environments/actionRequired/{tenantId}</td><td>Returns all non prem working environment actions required in a givent tenant.</td></tr><tr><td>GET</td><td>/working-environments</td><td>Retrieves all working environments.</td></tr><tr><td>GET</td><td>/working-environments/exists/{workingEnvironmentName}</td><td>Returns true if working environment with that name already exists, false otherwise.</td></tr></table></div>	GET	/working-environments/actionRequired/{tenantId}	Returns all non prem working environment actions required in a givent tenant.	GET	/working-environments	Retrieves all working environments.	GET	/working-environments/exists/{workingEnvironmentName}	Returns true if working environment with that name already exists, false otherwise.						
GET	/working-environments/actionRequired/{tenantId}	Returns all non prem working environment actions required in a givent tenant.														
GET	/working-environments	Retrieves all working environments.														
GET	/working-environments/exists/{workingEnvironmentName}	Returns true if working environment with that name already exists, false otherwise.														
6-12	<p>At the bottom of the window, click Try it out!</p> <div><p>Response Content Type application/json</p><p>Parameters</p><table><thead><tr><th>Parameter</th><th>Value</th><th>Description</th><th>Parameter Type</th><th>Data Type</th></tr></thead><tbody><tr><td>tenantId</td><td><input type="text"/></td><td>Filter working environments by tenantId. Required for Oncloud Admin if performing operation requesting specific fields</td><td>query</td><td>string</td></tr><tr><td>fields</td><td><input type="text"/></td><td></td><td>query</td><td>string</td></tr></tbody></table><p>Try it out! Hide Response</p></div>	Parameter	Value	Description	Parameter Type	Data Type	tenantId	<input type="text"/>	Filter working environments by tenantId. Required for Oncloud Admin if performing operation requesting specific fields	query	string	fields	<input type="text"/>		query	string
Parameter	Value	Description	Parameter Type	Data Type												
tenantId	<input type="text"/>	Filter working environments by tenantId. Required for Oncloud Admin if performing operation requesting specific fields	query	string												
fields	<input type="text"/>		query	string												
6-13	<p>Record the publicId: _____</p> <div><p>Request URL</p><p>http://10.2.0.6:80/occm/api/working-environments</p><p>Response Body</p><pre>{ "vsaWorkingEnvironments": [], "onPremWorkingEnvironments": [], "azureVsaWorkingEnvironments": [{ "publicId": "VsaWorkingEnvironment-pMjdukTs", "name": "azureOTC", "tenantId": "Tenant-ElwVivyw", "svmName": "svm_azureOTC", "creatorUserEmail": "student_netapp@outlook.com", "status": null, "providerProperties": null, "reservedSize": null, "clusterProperties": null, "ontapClusterProperties": null, "cloudProviderName": "Azure", }]}</pre></div>															
6-14	<p>Select ONTAP Cloud Azure working environments operations > azure-vsa/volumes > GET /azure/vsa/volumes.</p>															

Step	Action						
6-15	<div><div>Enter the workingEnvironmentId as the public Id that you recorded previously.</div><div><div>Response Content Type application/json ▼</div><div>Parameters</div><table><thead><tr><th>Parameter</th><th>Value</th><th>Description</th></tr></thead><tbody><tr><td>workingEnvironmentId</td><td><u>VsaWorkingEnvironment-pMjdukTs</u></td><td>Filter volumes by this working environment</td></tr></tbody></table><div><div>Try it out!</div><div>Hide Response</div></div></div></div>	Parameter	Value	Description	workingEnvironmentId	<u>VsaWorkingEnvironment-pMjdukTs</u>	Filter volumes by this working environment
Parameter	Value	Description					
workingEnvironmentId	<u>VsaWorkingEnvironment-pMjdukTs</u>	Filter volumes by this working environment					
6-16	Click Try it out!						
6-17	<div><div>Verify that you see information about your volumes in the Response Body.</div><div><div>Request URL</div><div>http://10.2.0.6:80/occm/api/azure/vsa/volumes?workingEnvironmentId=VsaWorkingEnvironment-pMjdukTs</div><div>Response Body</div><div><pre>[{ "name": "nfs_vol1", "svmName": "svm_azureOTC", "size": { "size": 10, "unit": "GB" }, "usedSize": { "size": 0.4544868469238281, "unit": "GB" }, "junctionPath": "/nfs_vol1", "mountPoint": "10.2.1.8:/nfs_vol1", "compressionSpaceSaved": { "size": 0, "unit": "GB" }, "deduplicationSpaceSaved": { "size": 0.5081634521484375,</pre></div></div></div>						

End of Exercise