Module 6: Managing Data Across a Hybrid Cloud

Exercise 1: Prepare a Disaster Recovery Cloud

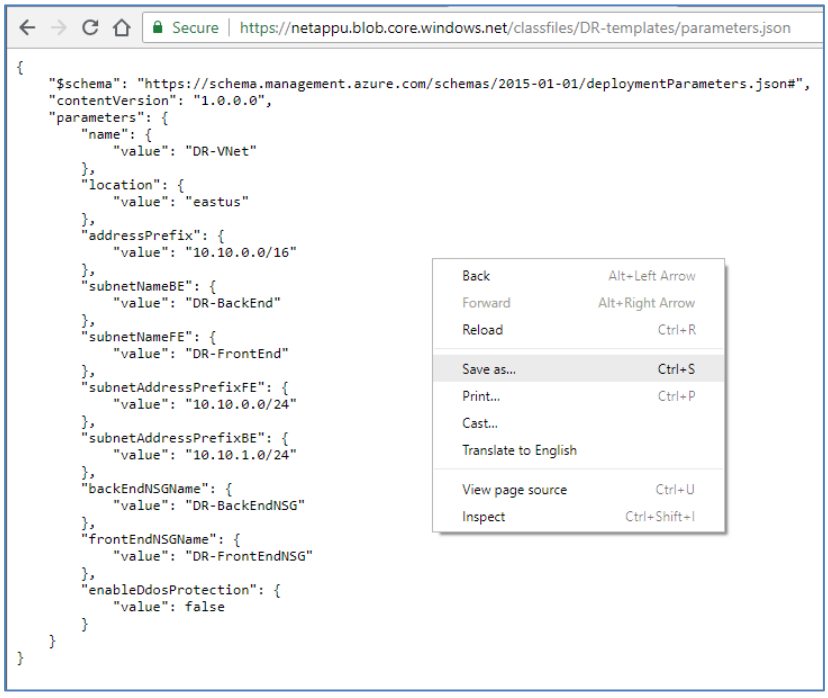
In this exercise, you create a disaster recovery Azure Virtual Network (VNet) by deploying an Azure Resource Manager (ARM) template. After the VNet has been created, you use a Swagger API web console to launch a second Cloud Volumes ONTAP instance into the new VNet.

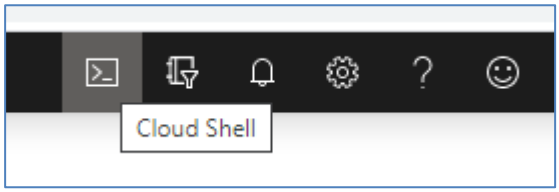
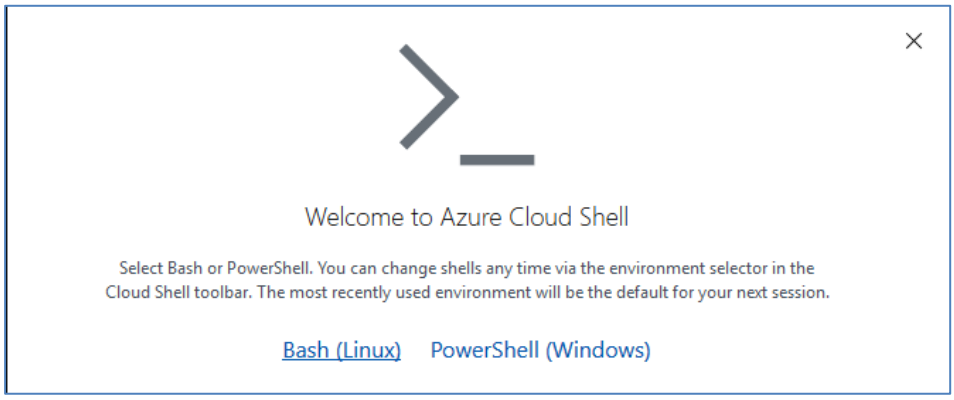
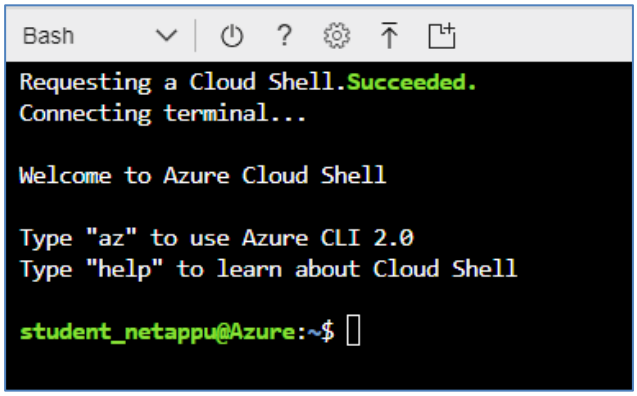
Objectives

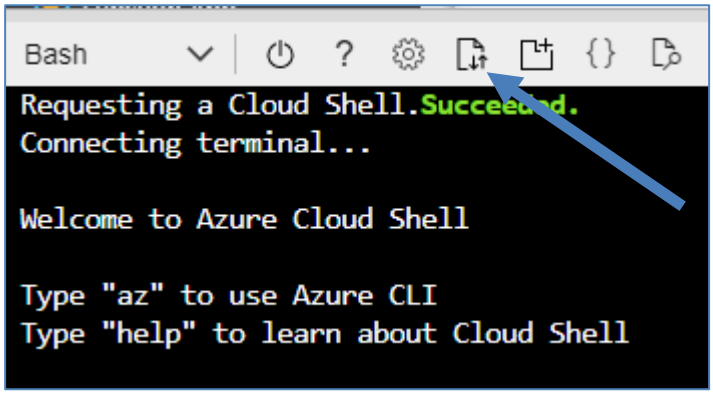
This exercise focuses on enabling you to do the following:

- Use an Azure template to deploy a VNet and other Azure resources
- Launch a Cloud Volumes ONTAP instance using Cloud Manager APIs

Task 1: Configure a Disaster Recovery VNet

Step	Action
1-1	Retrieve Azure template files for creating a VNet: a. Open a browser tab, and enter this URL: b. https://cvoadminazure.s3.amazonaws.com/DR-templates/DR-templates/vnet-parameters.json.txt c. Save the parameter file to your laptop or jump host.  d. Open a browser tab, and enter this URL: e. https://cvoadminazure.s3.amazonaws.com/DR-templates/DR-templates/vnet-template.json.txt f. Save the template file to your laptop or jump host.

Step	Action
1-2	Go to the Azure portal, and click the Cloud Shell icon. 
1-3	At the bottom of the window, a new Azure interface appears. Click **Bash (Linux)**. 
1-4	In the You have no storage mounted dialog box, click **Create Storage**.
1-5	Verify that a CLI interface appears. (Note: It can take several minutes for the storage account to be created and the cloud shell to become operational.) 

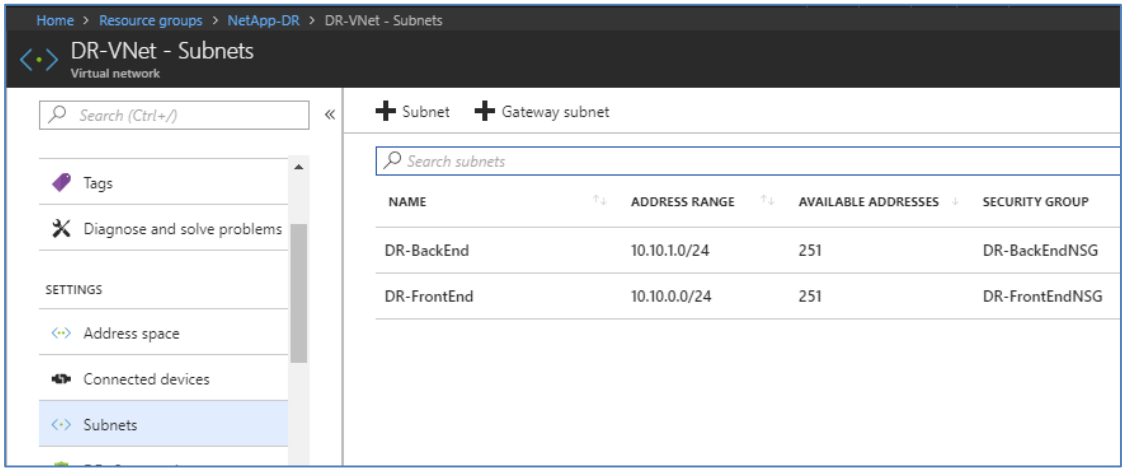
Step	Action
1-6	In the cloud shell toolbar, click the upload file icon. 
1-7	Upload the vnet-template.json and vnet-parameters.json files that you downloaded to your laptop or jump host.

1-8	Verify that the files were uploaded:
	`~$ ls`
	Example output:
	`clouddrive  vnet-parameters.json  vnet-template.json`

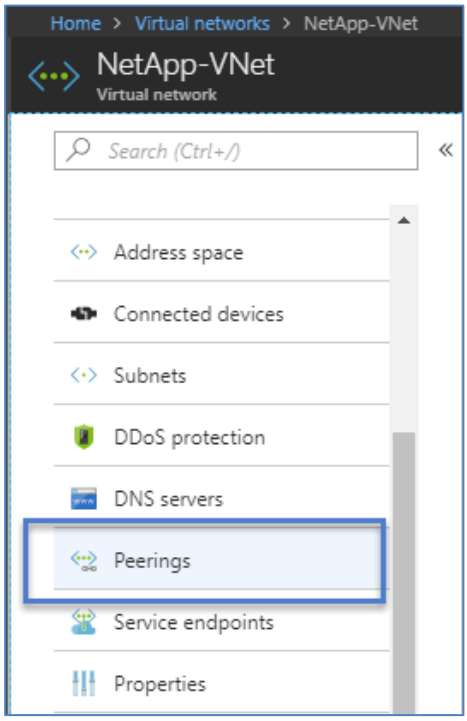
1-9	Create an Azure resource group:
	`~$ az group create --name NetApp-DR --location 'eastus'`
	Example output:
	`{`
	`  "id": "/subscriptions/c15e10e3-888e-45bc-b22e-1af52c627004/resourceGroups/NetApp-DR",`
	`  "location": "eastus",`
	`  "managedBy": null,`
	`  "name": "NetApp-DR",`
	`  "properties": {`
	`  "provisioningState": "Succeeded"`
	`  },`
	`  "tags": null`
	`}`

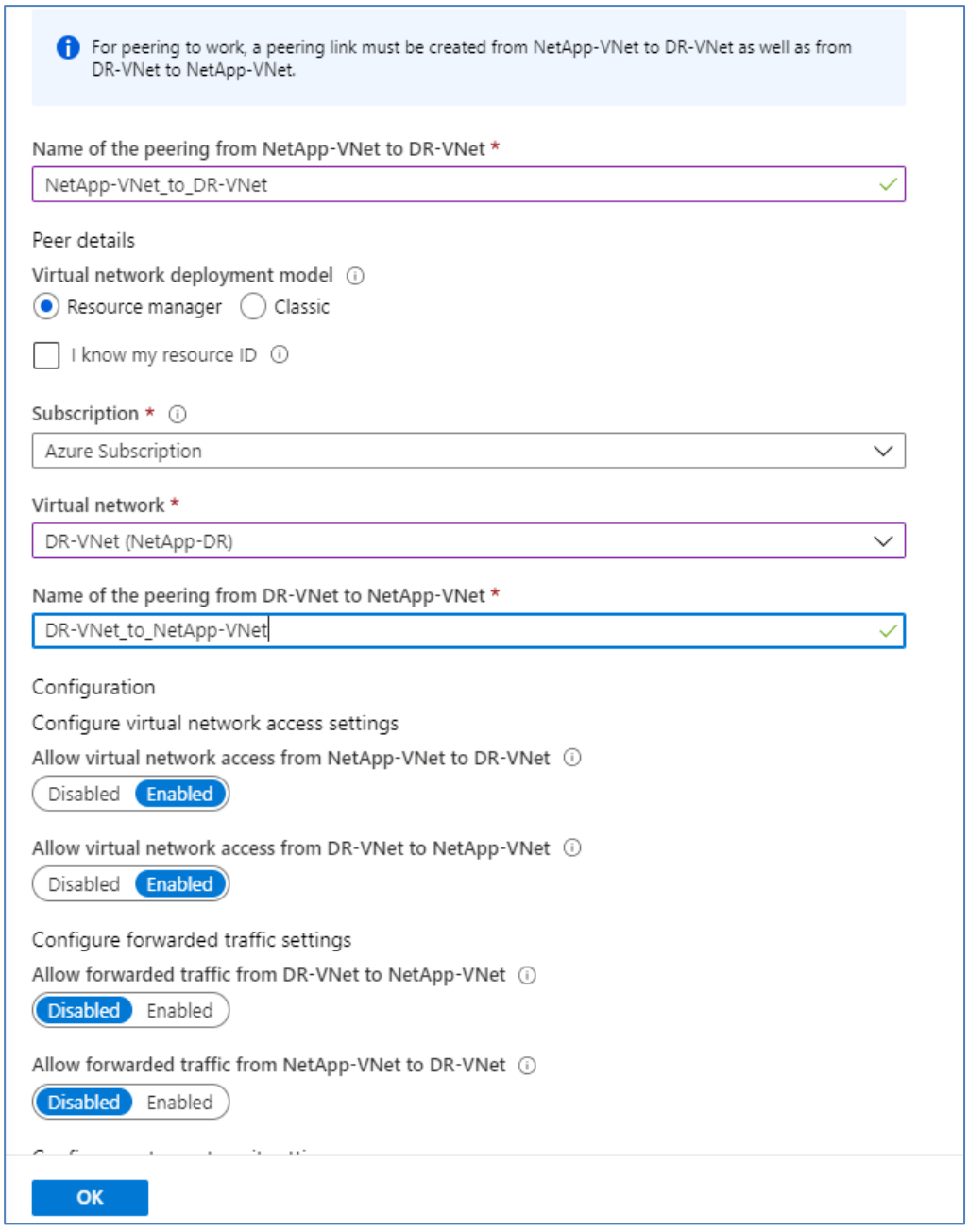
Step	Action

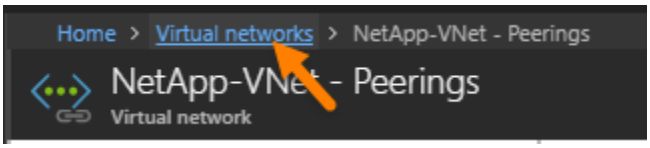
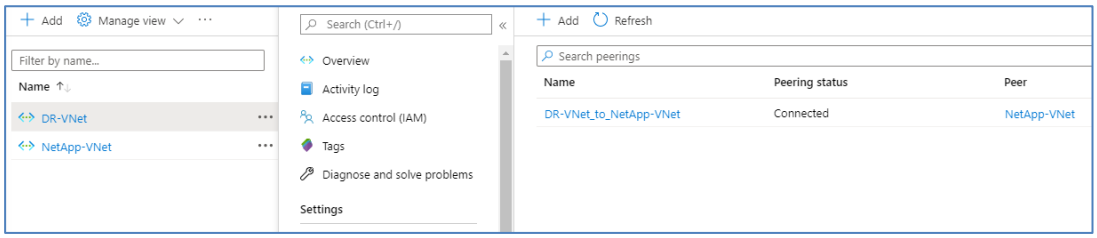
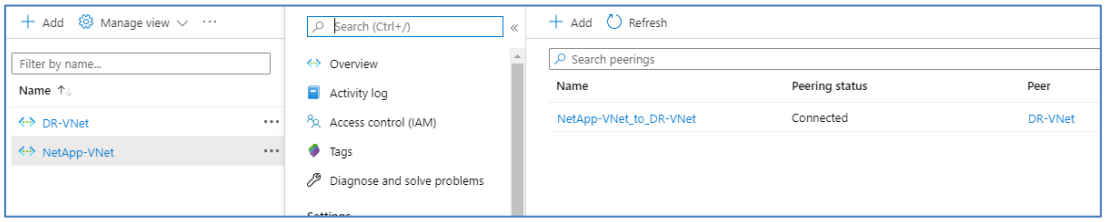
1-10	Deploy the VNet using the Azure templates:
	~$ az group deployment create --name DRDeploy --resource-group NetApp-DR --template-file vnet-template.json --parameters vnet-parameters.json
	Example truncated output:
	`{`
	`  "id": "/subscriptions/c15e10e3-888e-45bc-b22e-1af52c627004/resourceGroups/NetApp-DR/providers/Microsoft.Resources/deployments/DRDeploy",`
	`  "name": "DRDeploy",`
	`  "properties": {`
	`  "additionalProperties": {`
	`  "duration": "PT37.3391106S",`
	`  "outputResources": [`
	`  {`
	`  "id": "/subscriptions/c15e10e3-888e-45bc-b22e-1af52c627004/resourceGroups/NetApp-DR/providers/Microsoft.Network/networkSecurityGroups/DR-BackEndNSG",`
	`  "resourceGroup": "NetApp-DR"`
	`  },`
	…
	`  "provisioningState": "Succeeded",`
	`  "template": null,`
	`  "templateLink": null,`
	`  "timestamp": "2018-05-21T19:37:37.166162+00:00"`
	`  },`
	`  "resourceGroup": "NetApp-DR"`
	`}`

1-11	In the Azure portal, verify that the DR-VNet was created and that the subnets have the correct security groups associated with them. 

Task 2: Peer VNets

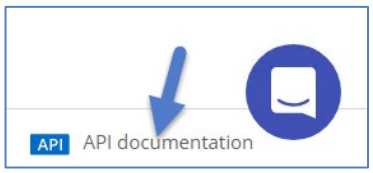
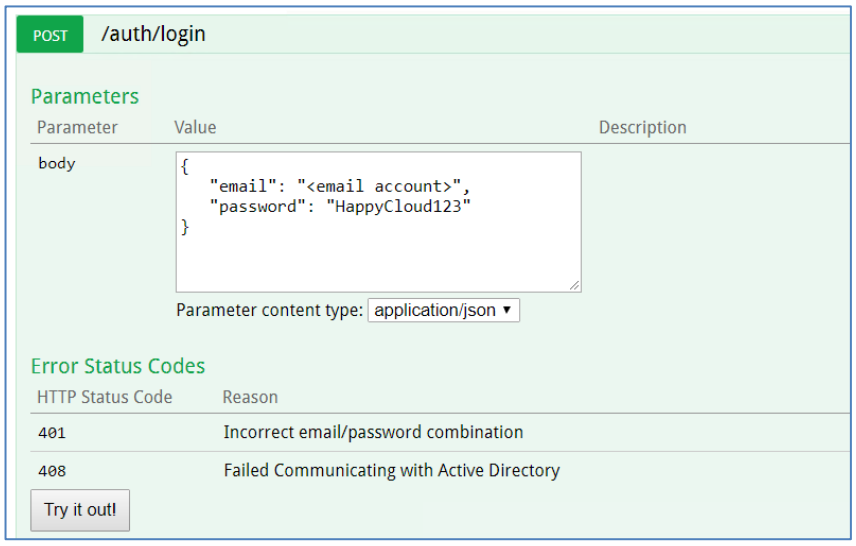
Step	Action
2-1	In the Azure portal, click **Virtual Networks**.
2-2	Under Virtual networks, click **NetApp-VNet**.
2-3	In the Virtual network menu, click **Peerings**. 
2-4	Click + **Add**.

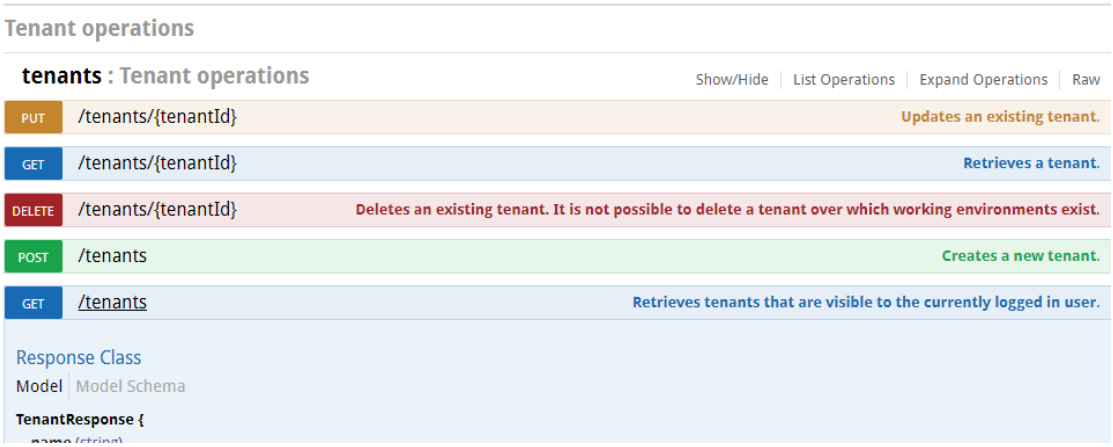
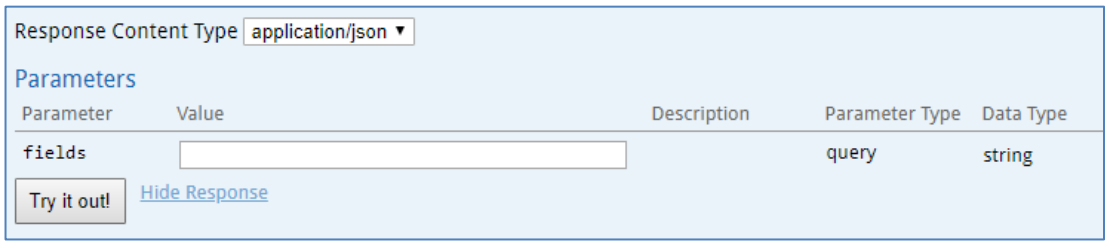
Step	Action
2-5	Under Add peering, do the following: a. For the Name of the peering from NetApp-VNet to remote virtual network, enter **NetApp-VNet_to_DR-VNet**. b. For the Peer details, select **Resource manager**. c. For the Subscription, select **your subscription**. d. For the Virtual network, select **DR-VNet (NetApp-DR)**. e. For the Name of the peering from DR-VNet to NetApp-VNet, enter **DR-VNet_to_NetApp-VNet**. f. Leave the other defaults, click **OK**. 

Step	Action
2-6	Click **OK**.
2-7	In the blade (pane) progression, click **Virtual networks**. 
2-8	Under Virtual networks, click **DR-VNet**.
2-9	In the Virtual network menu, click **Peerings**.
2-10	You will now see that DR-VNet is peered and connected to NetApp-VNet. 
2-11	Under Virtual networks, click **NetApp-VNet**.
2-12	In the Virtual network menu, click **Peerings**.
2-13	You will now see that NetApp-VNet is peered and connected to DR-VNet. 
2-14	Azure automatically adds the required default system routes for the VNet peering routes between the two connected VNets. When virtual networks are peered in the same region, you can also configure the gateway in the peered virtual network as a transit point to an on-premises network.

Task 3: Deploy Cloud Volumes ONTAP Using Swagger

In this task, you use APIs to launch a new Cloud Volumes ONTAP instance in the newly created disaster recovery VNet.

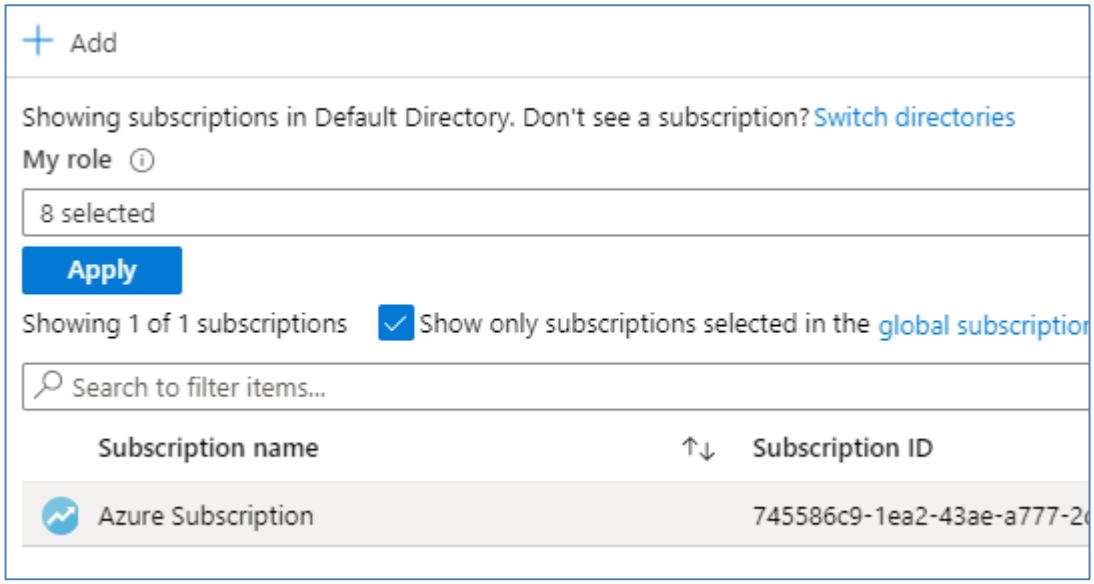
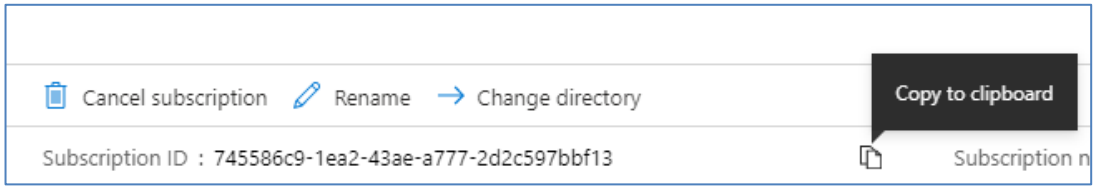
Step	Action
3-1	Return to the Cloud Manager tab in the browser.
3-2	At the bottom right of the page, click **API documentation.** 
3-3	A new tab is opened in the browser with the API documentation. Wait for the page to populate. It might take several minutes.
3-4	Click **User management operations.** 
3-5	Select **auth > /auth/login**.
3-6	Enter the value as shown in this illustration, replacing <email account> with the email account that you use to log in to Cloud Manager: 
3-7	Click **Try it out!**

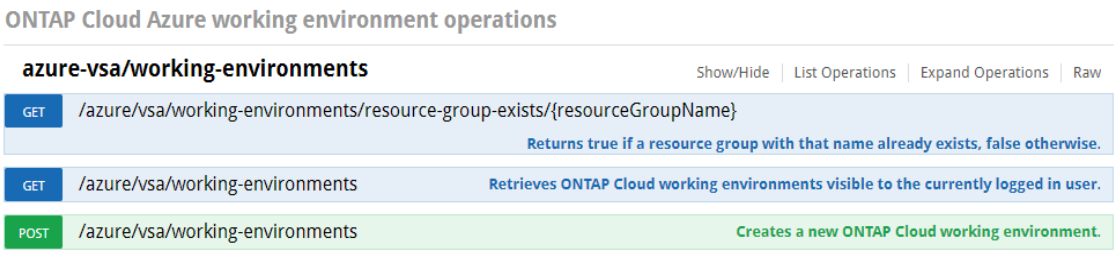
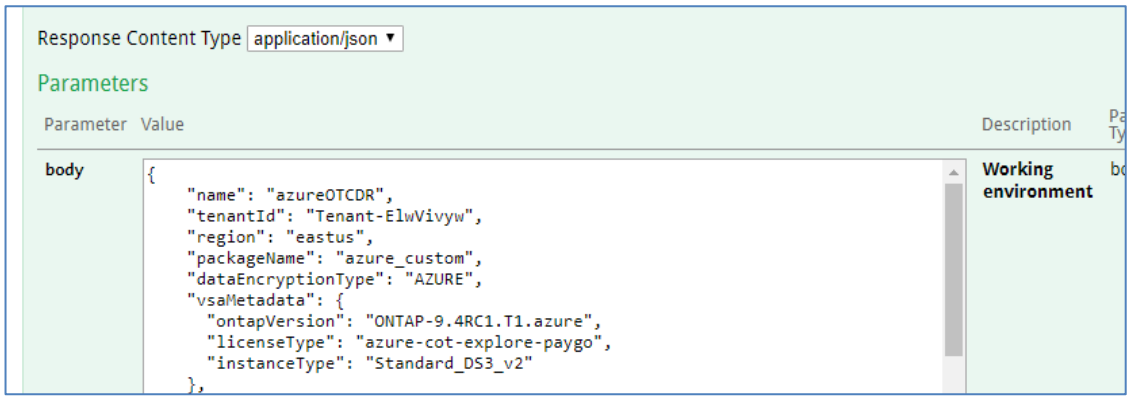
Step	Action
3-8	Verify that the response code is 204. 
3-9	Select **Tenant operations** > **tenants** > **GET tenants.** 
3-10	At the bottom of the window, click **Try it out!** 

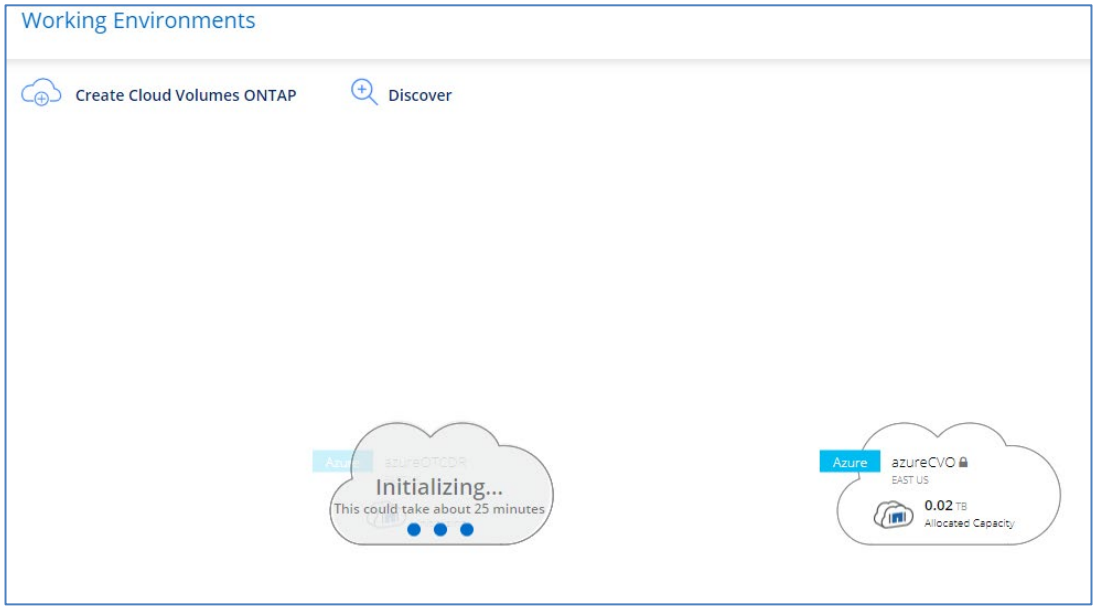
Step	Action

3-11	Record the publicId of the AzureCloudMgr tenant: _____
	This ID is your tenant ID.
	Request URL
	`http://23.96.1.233:80/occm/api/tenants`
	Response Body
	`[ { "name": "CloudMgrAzure", "publicId": "Tenant-ElwVivyw", "costCenter": "", "description": "",`

3-12	Retrieve the API file for creating a Cloud Volumes ONTAP working environment: a. Open a browser tab and enter this URL: **https://cvoadminazure.s3.amazonaws.com/DR-templates/DR-templates/LaunchOTCinDR.json.txt** b. Save the launch file to your laptop or jump host. c. Open the file with your favorite editor. d. For the value of the key "tenantId", replace the following text "<Replace with your OCCM Tenant ID>" with the tenant ID that you recorded. e. For the value of the key “ontapVersion”, replace the text “ONTAP-9.4.T1.azure” with ONTAP-9.7P1.T1.azure. Example edit: LaunchOTCinDR.json | new 6 | Trident | new 7 | new 8 | new `{ "name": "azureOTCDR", "tenantId": "workspace-rpneLOWw", "region": "eastus", "packageName": "azure_custom", "dataEncryptionType": "AZURE", "vsaMetadata": { "ontapVersion": "ONTAP-9.7P1.T1.azure", "licenseType": "azure-cot-explore-paygo", "instanceType": "Standard_DS3_v2" }, "writingSpeedState": "NORMAL",`
3-13	Return to the Azure portal.
3-14	Click **All services**.
3-15	In the search bar, enter **subscriptions**, and then click **Subscriptions**.

Step	Action
3-16	Click on the Subscription name line of your subscription. 
3-17	Copy your Subscription ID. 
3-18	Return to the editor where you are editing the **LaunchOTCinDR.json** file in your favorite text editor.
3-19	In the three places that you see the text "<Replace with Your Subscription ID>," replace this text with the Subscription ID that you copied. Example edit: 
3-20	Return to the API Swagger tab in your browser.

Step	Action
3-21	Select **ONTAP Cloud Azure working environment operations** > **azure-vsa/working-environments** > **POST /azure/vsa/working-environments.** 
3-22	Scroll to the Parameters section, and copy and paste the text from the **LaunchOTCinDR.json** into the body. 
3-23	Click **Try it out!**

Step	Action
3-24	Verify that you get back a response of 202. Request URL `http://23.96.1.233:80/occm/api/azure/vsa/working-environments` Response Body `{ "creatorUserEmail": "student_netappu@outlook.com", "status": null, "providerProperties": null, "reservedSize": null, "clusterProperties": null, "ontapClusterProperties": null, "cloudProviderName": "Azure", "snapshotPolicies": null, "actionsRequired": null, "activeActions": null, "replicationProperties": null, "schedules": null, "svms": null, "workingEnvironmentType": "VSA", "supportRegistrationProperties": null, "supportRegistrationInformation": null, "capacityFeatures": null, "encryptionProperties": null, "supportedFeatures": null }`  Response Code `202`
3-25	Return to the Cloud Manager tab in your browser, and click Working Environments.
3-26	Wait for the ONTAP Cloud working environment to launch. 

Step	Action
3-27	 In an earlier exercise, you saved the Show API request when you created your first Cloud Volumes ONTAP. The new Cloud Volume ONTAP will take ~25 minutes to complete. Take this time to see the differences between the Show API request you saved in the previous exercise to the json file downloaded in this exercise. Are there any differences? Record your thoughts.

End of Exercise