NetApp ONTAP Cloud with SQL Server on Azure

Quick Start Reference Deployment

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1. Overview

This Quick Start reference deployment guide provides step-by-step instructions for deploying an environment with NetApp ONTAP Cloud and Microsoft SQL Server on Azure.

NetApp data storage systems are used by enterprises that require complete control, efficiency, durability, and resiliency of their data. NetApp ONTAP Cloud is a software-only version of Data ONTAP, which is the data management operating system from NetApp that is used on physical NetApp storage appliances.

The features of ONTAP Cloud include:

- Storage efficiencies that enable you to use less underlying storage capacity for your data needs
- Instant backup and recovery for data of all sizes
- Space-efficient, intuitive, bi-directional data transfer
- Instant, writable data clones that consume no additional storage capacity
- Ability to use multiple protocols (NFS, CIFS, and iSCSI) from the same storage system, at the same time

With ONTAP Cloud on Azure, you can spin up a new enterprise-class data management system in minutes on the cloud. This Quick Start automatically sets up a SQL Server 2014 – NetApp ONTAP Cloud with SQL Server on Azure.

Environment that receives its storage and enterprise-class data management capabilities from a NetApp ONTAP Cloud system running on Azure. The Quick Start uses NetAPP OnCommand Cloud Manager to deploy and configure ONTAP Cloud.

2. Costs and Licenses

This NetApp ONTAP Cloud is the PAYGO model and doesn't require the user to license it, it will be licensed automatically after the instance is launched first time and user will be charged hourly. Follow

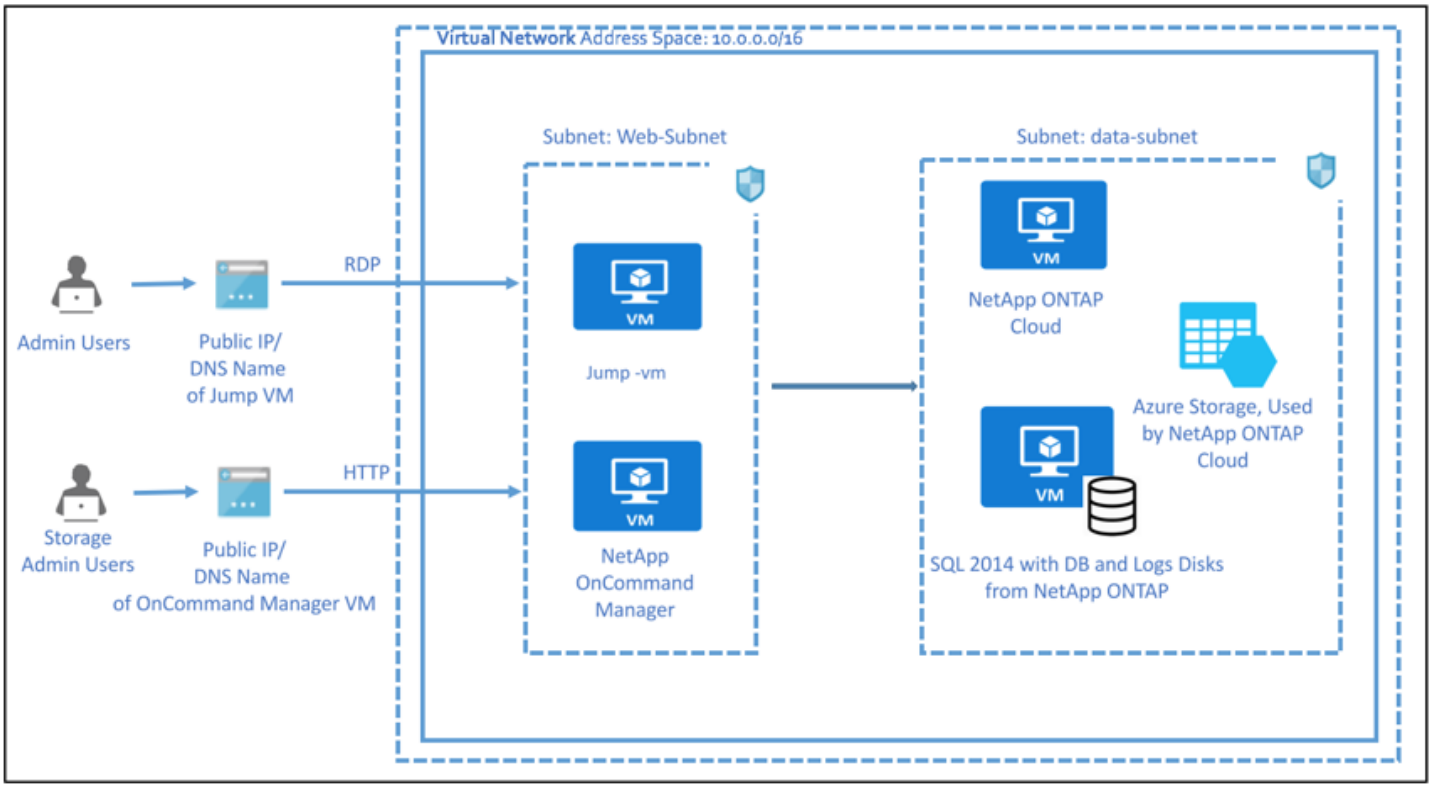
this link https://azuremarketplace.microsoft.com/en-us/marketplace/apps/netapp.netapp-ontap-cloud?tab=Overview for pricing details.

This Quick Start template includes configuration parameters that you can customize. Some of these settings, such as database size, will affect the cost of deployment.

3. Architecture

This template will deploy:

- Six storage accounts
- One Virtual Network with two subnets
- 2 Public IP's, one for OnCommand Manager and one for the Jump VM
- One OnCommand Cloud Manager (BYOL) (for ONTAP Cloud)
- One Windows Server 2012 R2 VM.
- One SQL Server 2014 SP2 Enterprise on Windows Server 2012 R2 VM.
- One NetApp ONTAP Cloud VM



4. Prerequisites

Azure Subscription with specified payment method (NetApp ONTAP cloud is a market place product and requires payment method to be specified in Azure Subscription).

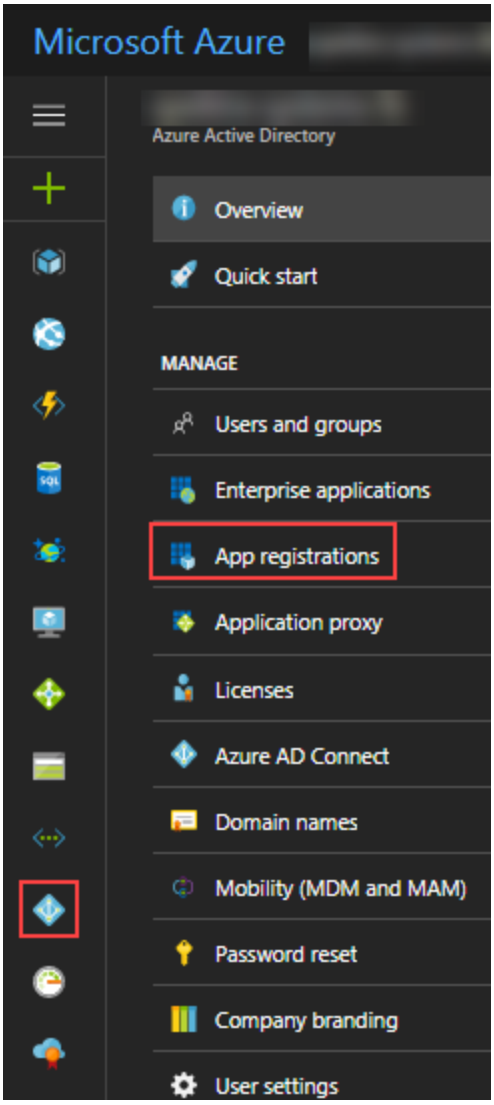
To deploy the Quick start template, programmatic deployments should be enables in the azure subscription. Instructions are provided in the Deployment Steps section.

An application key along with the Application Id is required for the deployment of this template. Instructions are provided in the Deployments Steps Section.

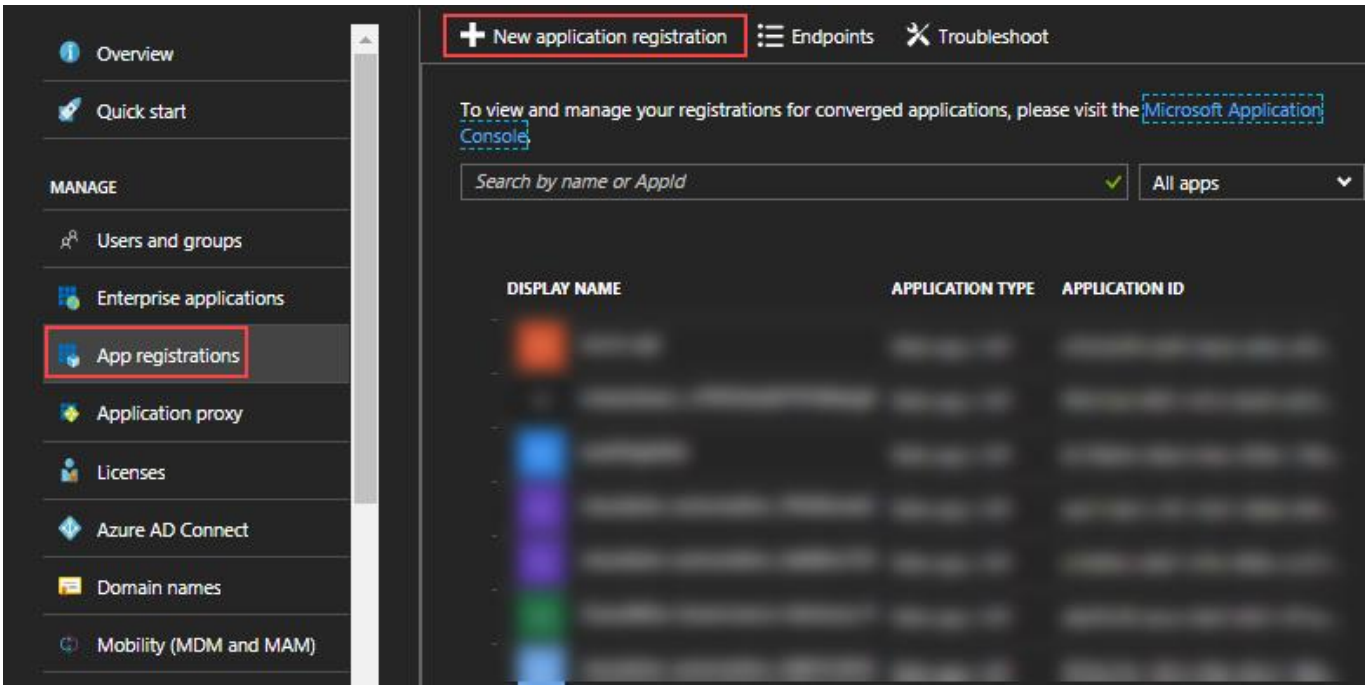
5. Deployment Steps

5.1 Creating an Active Directory Application

1. In the Azure Portal, on the side bar, click on **Active Directory** and click on **App registrations**.

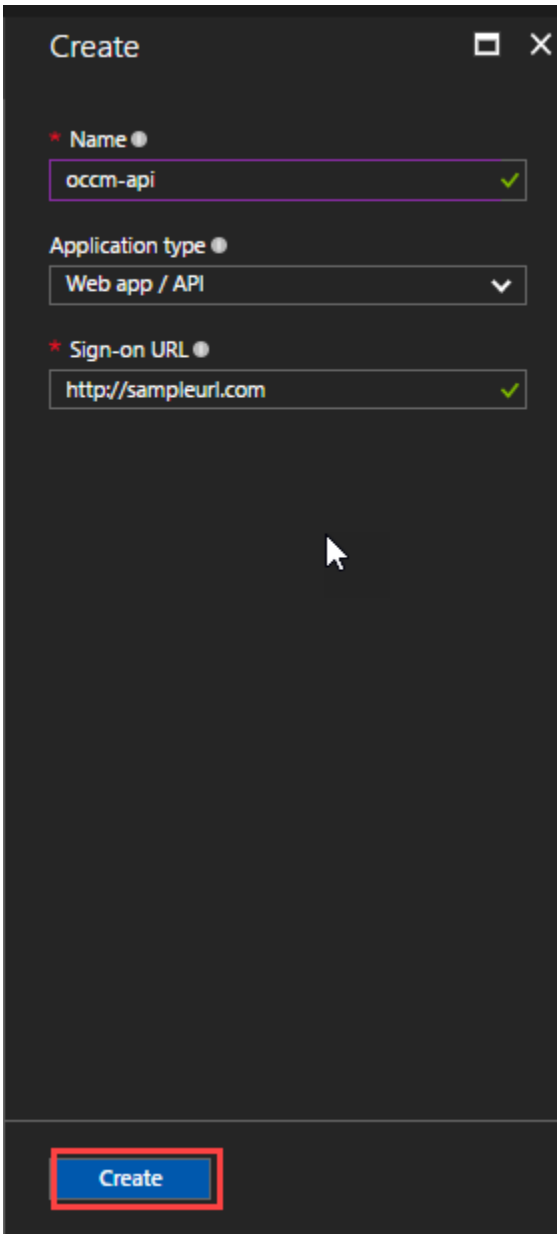


2. Click on **+New application registration.**

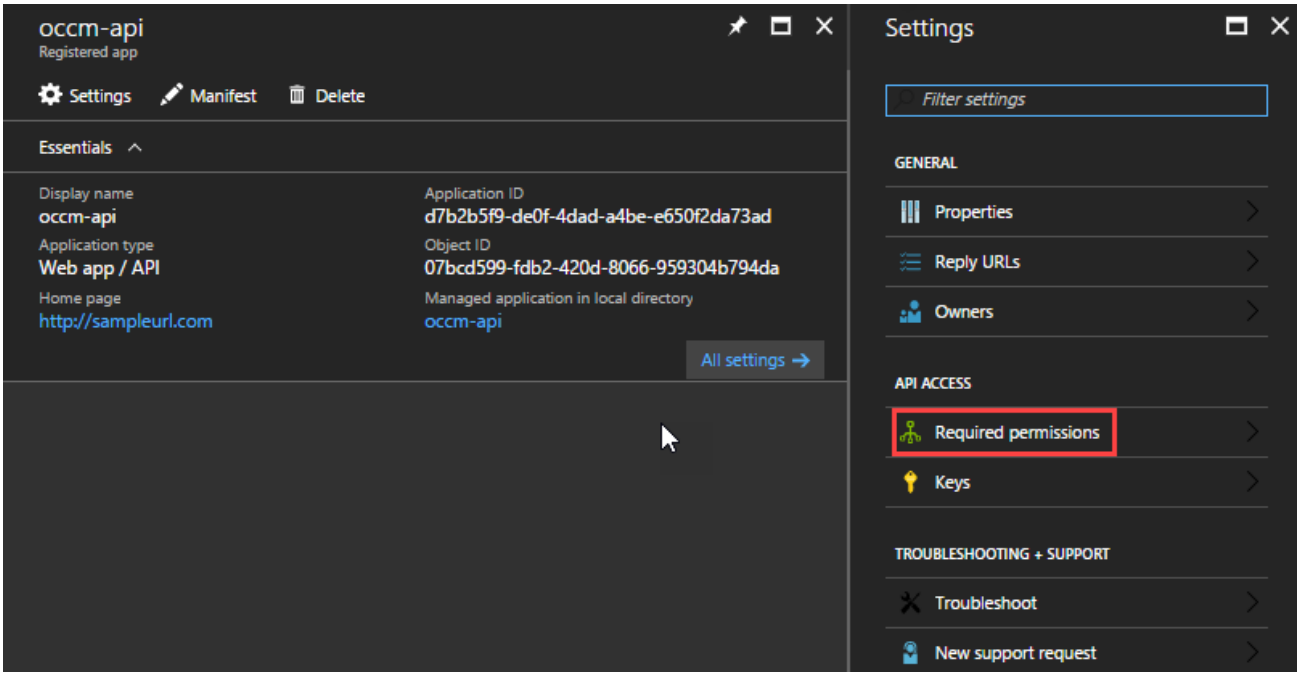


3. Enter the following details:
   Name: **occm-api**
   Application Type: **Web app/ API**
   Sign-on URL: **http://sampleurl.com**

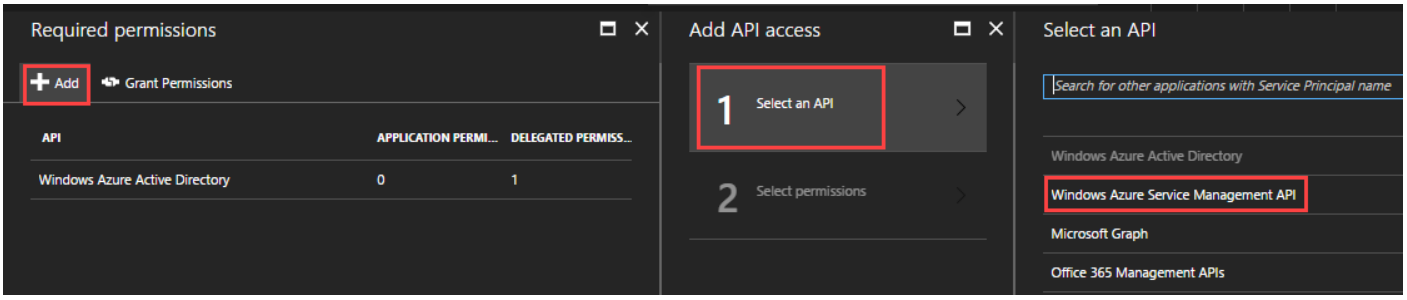
4. Click on **Create.**



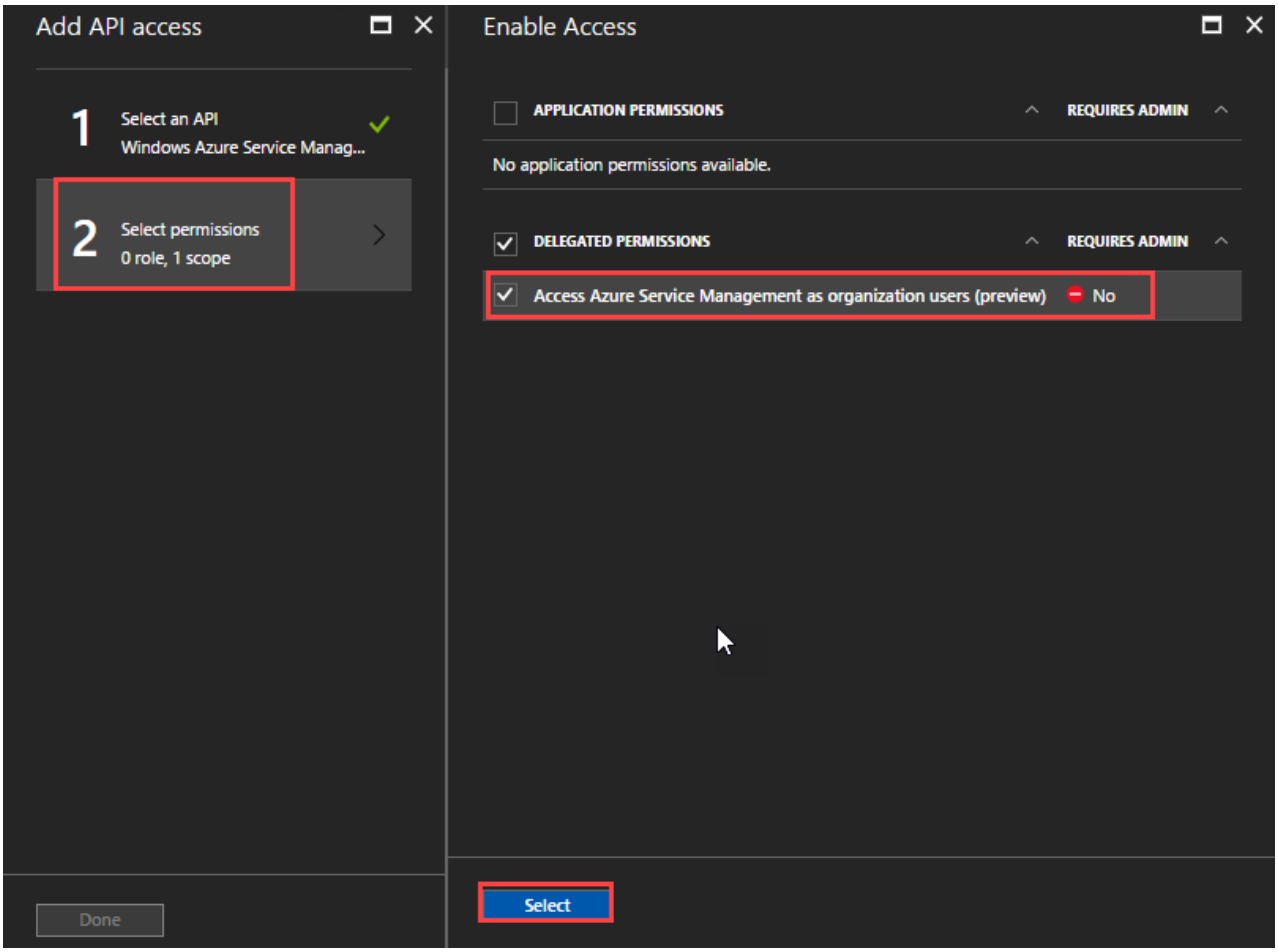
5. The application will get created. Copy and save the **Application ID** as you will need it during the deployment of the template. After the application **occm-api** gets created, click on **occm-api**. Click on **Required permissions.**



6. Click **+Add** on Required permissions page. Click on **Select an API**. Select **Windows Azure Service Management API**.

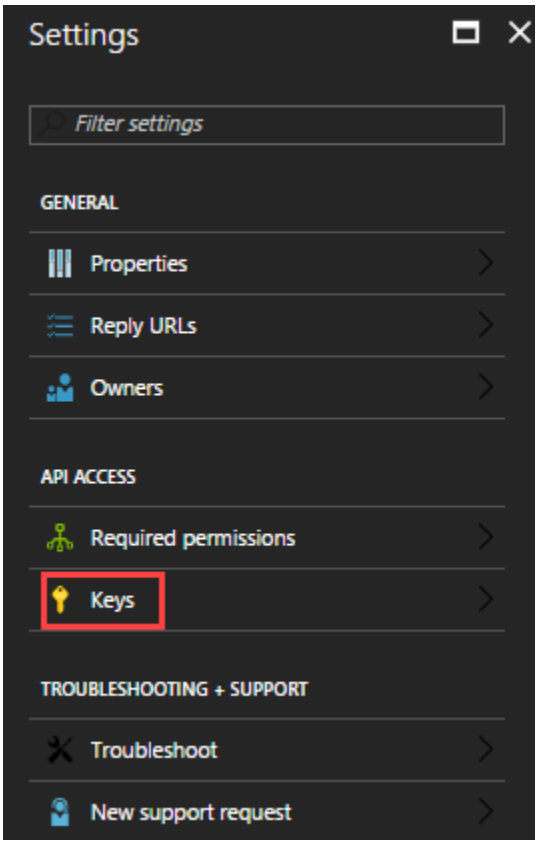


7. Click on **Select permissions** and select **Access Azure Service Management as organization users (preview).** Click on **Select.**



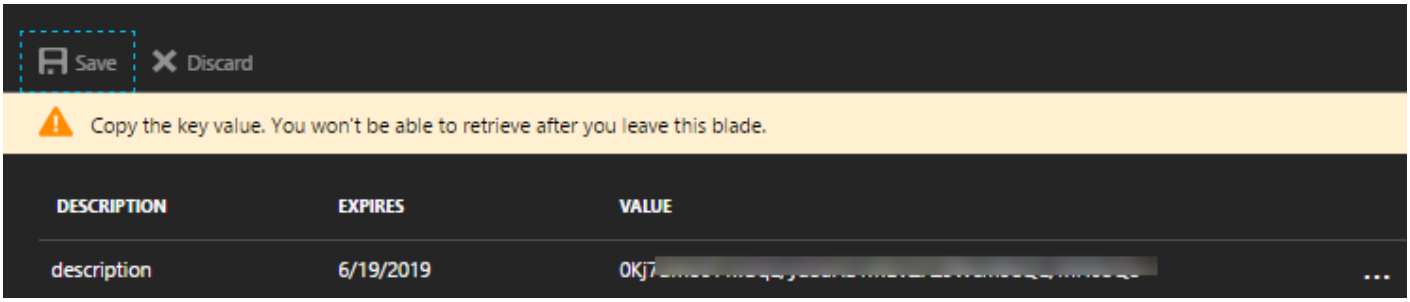
5.2 Creating an Application Key.

1. Click on **Keys** under the **Settings** page for your application id.



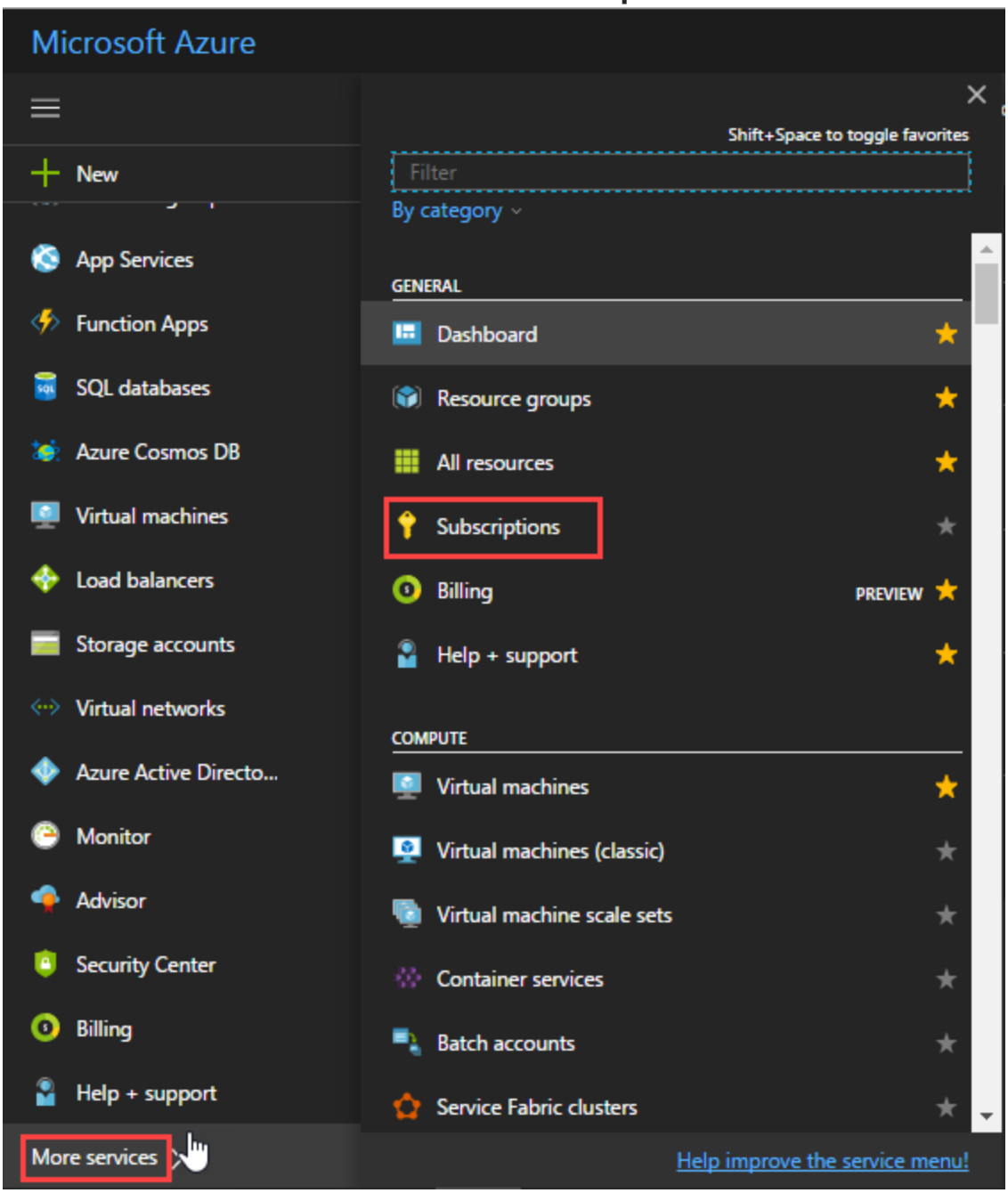
2. Set an expiry and click on **Save.** The value of the key will be displayed after clicking on **Save.**

3. Make sure to copy the Value as you won't be able to retrieve after you leave the scope of the key creation. This value is used as application key for your Cloud Manager setup.

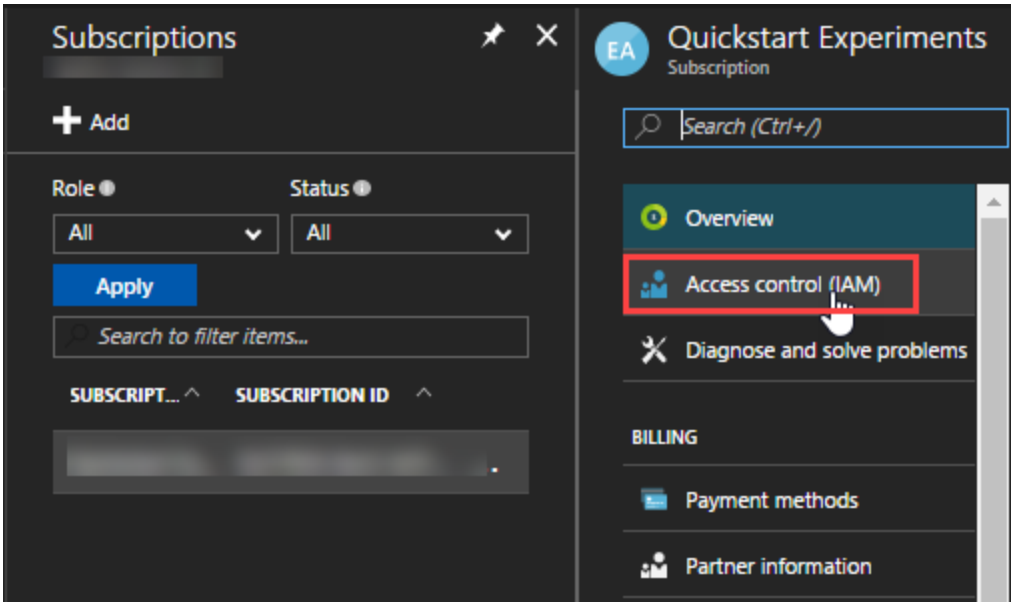


5.3 Assigning the Cloud Manager role to AD application

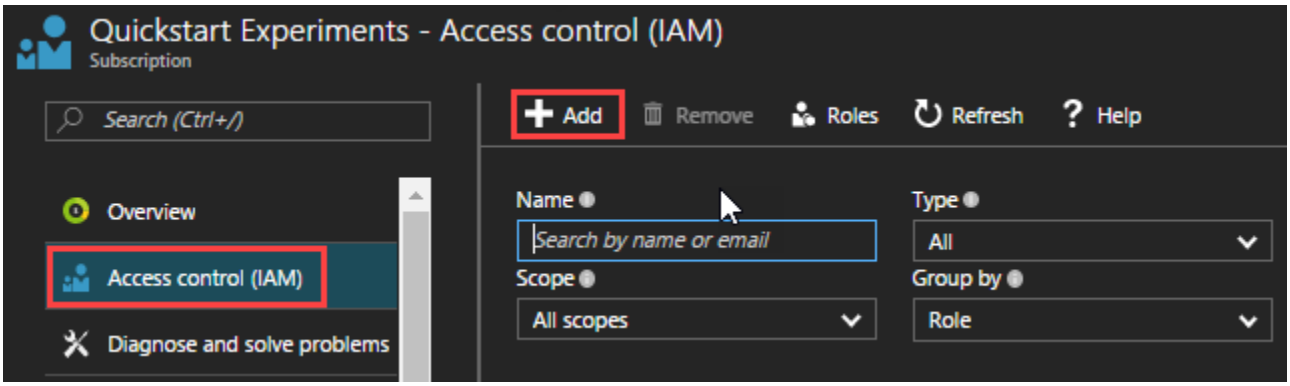
1. Click on **More services** and then click on **Subscriptions**.



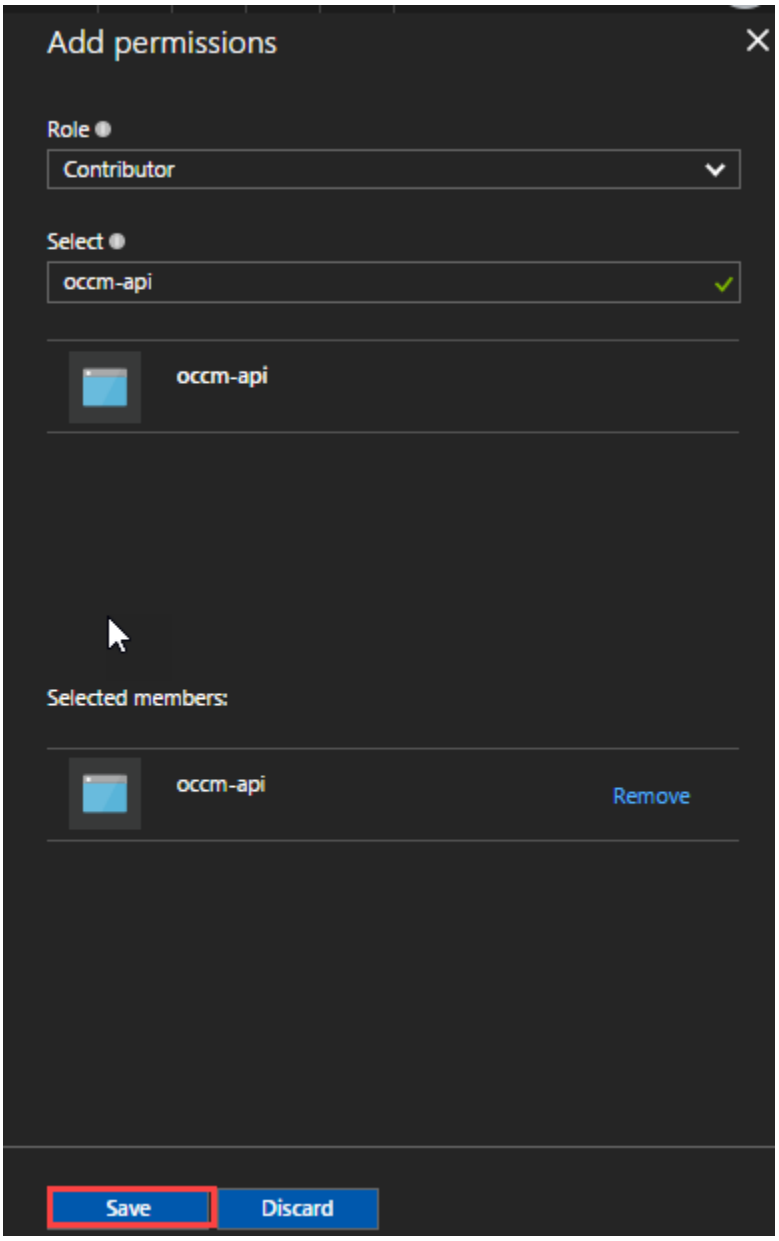
2. Click on your **Subscription** and click **Access Control**(IAM)



3. After clicking **Access Control**(IAM) -> click **Add** (+)

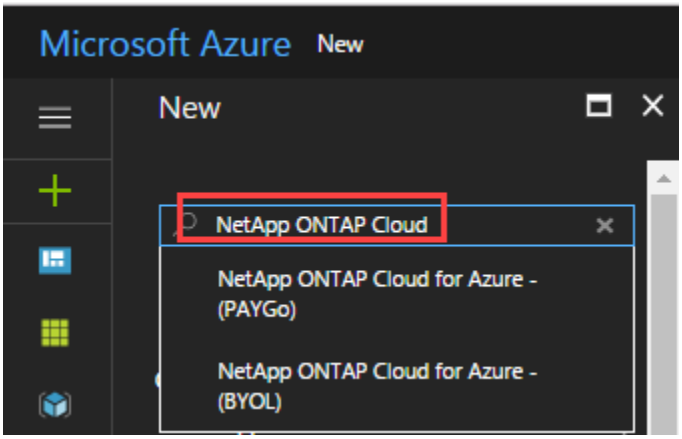


4. After clicking on **Add,** enter the following details:
   Role: **Contributor**
   Select: **occm-api**
5. Click on **Save.**

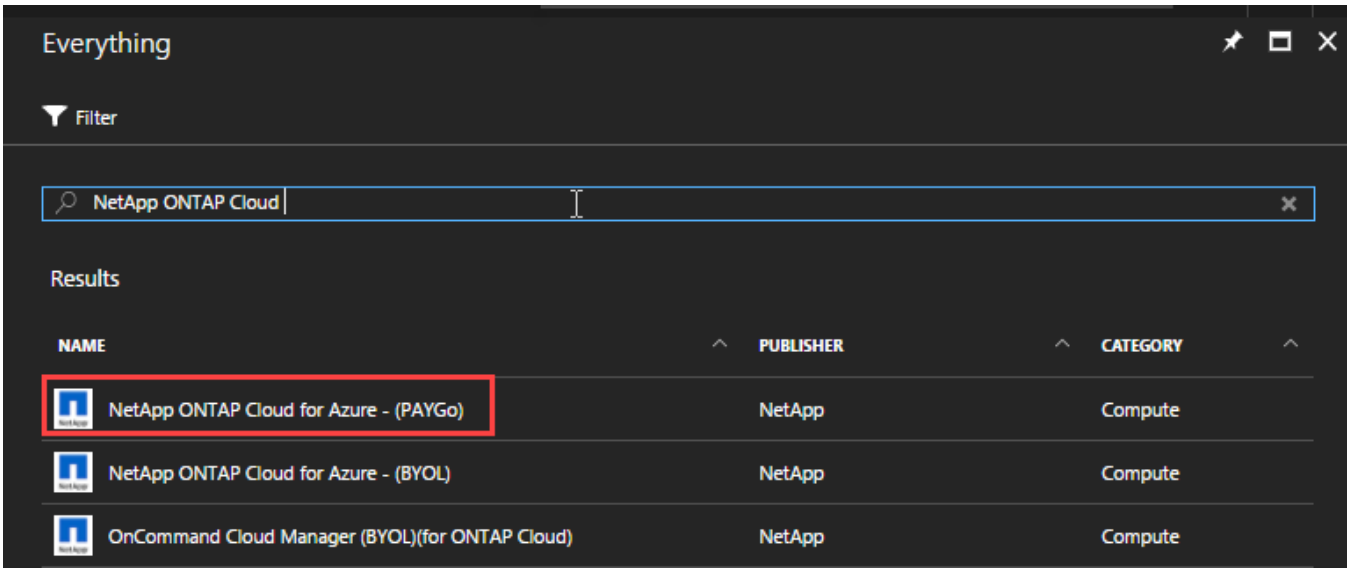


5.4 Enable Programmatic Deployment

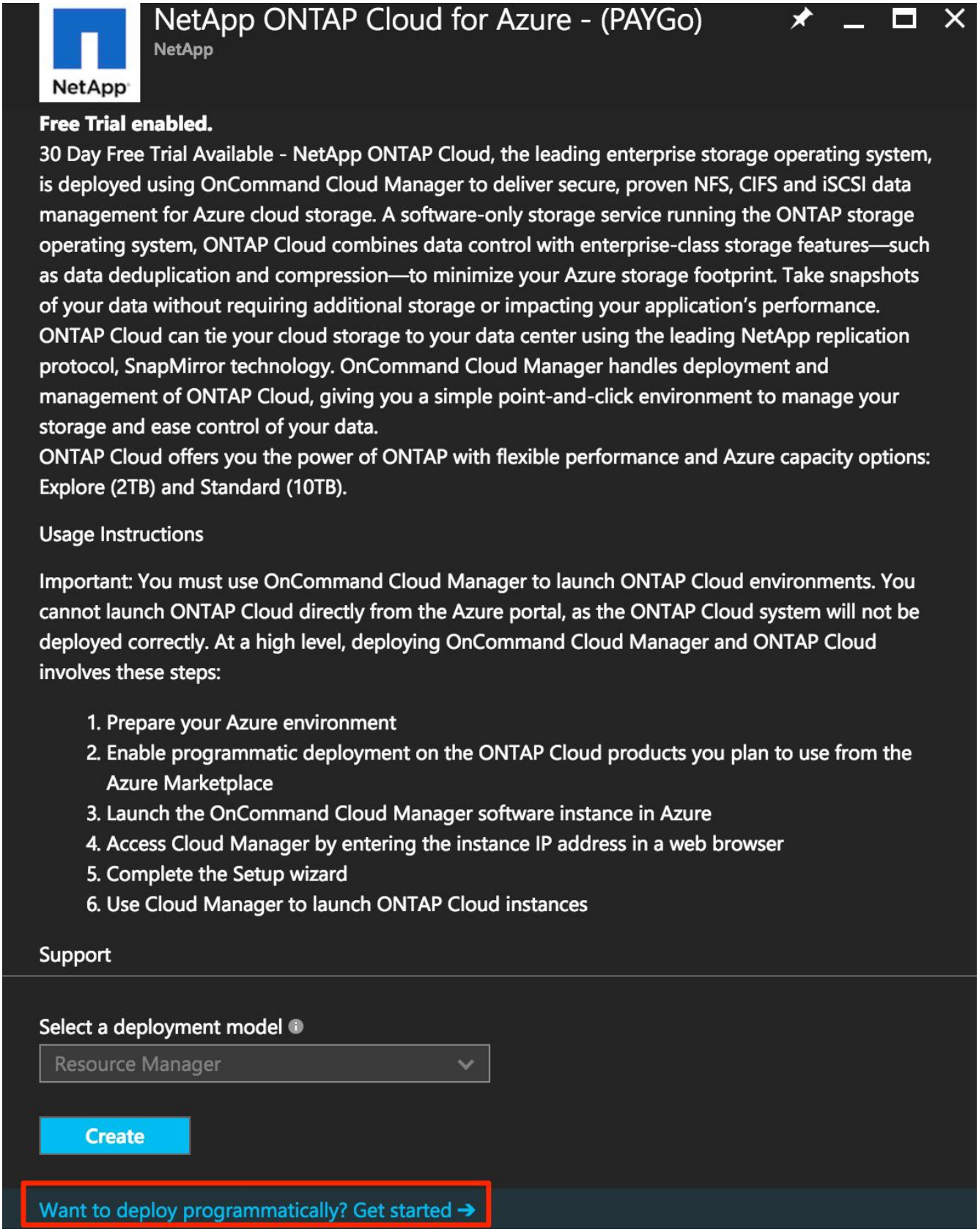
1. Search for NetApp ONTAP Cloud in Marketplace.



1. Click on **NetApp ONTAP Cloud for Azure – (PAYGo)**



2. Click on "**Want to deploy programmatically? Get Started**" link



3. Toggle status from Disable to **Enable** for your subscription and click **save.**

Configure Programmatic Deployment

Offer details

NetApp ONTAP Cloud for Azure - (PAYGo)
by NetApp
Terms of use | privacy policy

Pricing does not include Azure infrastructure costs (e.g., virtual machine compute time or storage) and is based on the pricing tier you select at the time of deployment. The pricing above applies only to Azure subscriptions purchased from Microsoft. For Azure subscriptions purchased from a reseller, contact your reseller for pricing. Neither subscription credits nor monetary commitment funds may be used to purchase non-Microsoft offerings. These purchases are billed separately. If any Microsoft products are included in the above offering(s) (e.g., Windows Server or SQL Server), such products are licensed by Microsoft and not by any third party.

Terms of use

By enabling programmatic purchases for the subscriptions selected below, I (a) agree to the legal terms and privacy statement(s) associated with each offering above, (b) for Azure subscriptions purchased from Microsoft, authorize Microsoft to charge or bill my current payment method for the fees associated with my use of the offering(s), including applicable taxes, with the same billing frequency as my Azure subscription, until I discontinue use of the offering(s), and (c) agree that Microsoft may share my contact information, and transaction details associated with my purchase of the above offering(s), with any third-party vendors, if listed above. Microsoft does not provide rights for third-party products or services. See the Azure Marketplace Terms for additional terms.

Choose the subscriptions

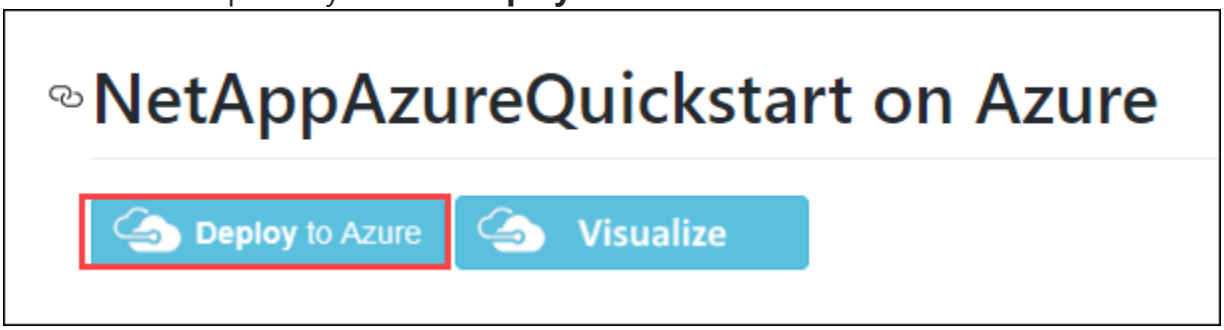
Select the Azure subscriptions for which you would like to enable programmatic deployments of the above offering(s)

SUBSCRIPTION NAME	SUBSCRIPTION ID	STATUS
Microsoft Azure Enterprise	[illegible]	Enable Disable

Save Discard

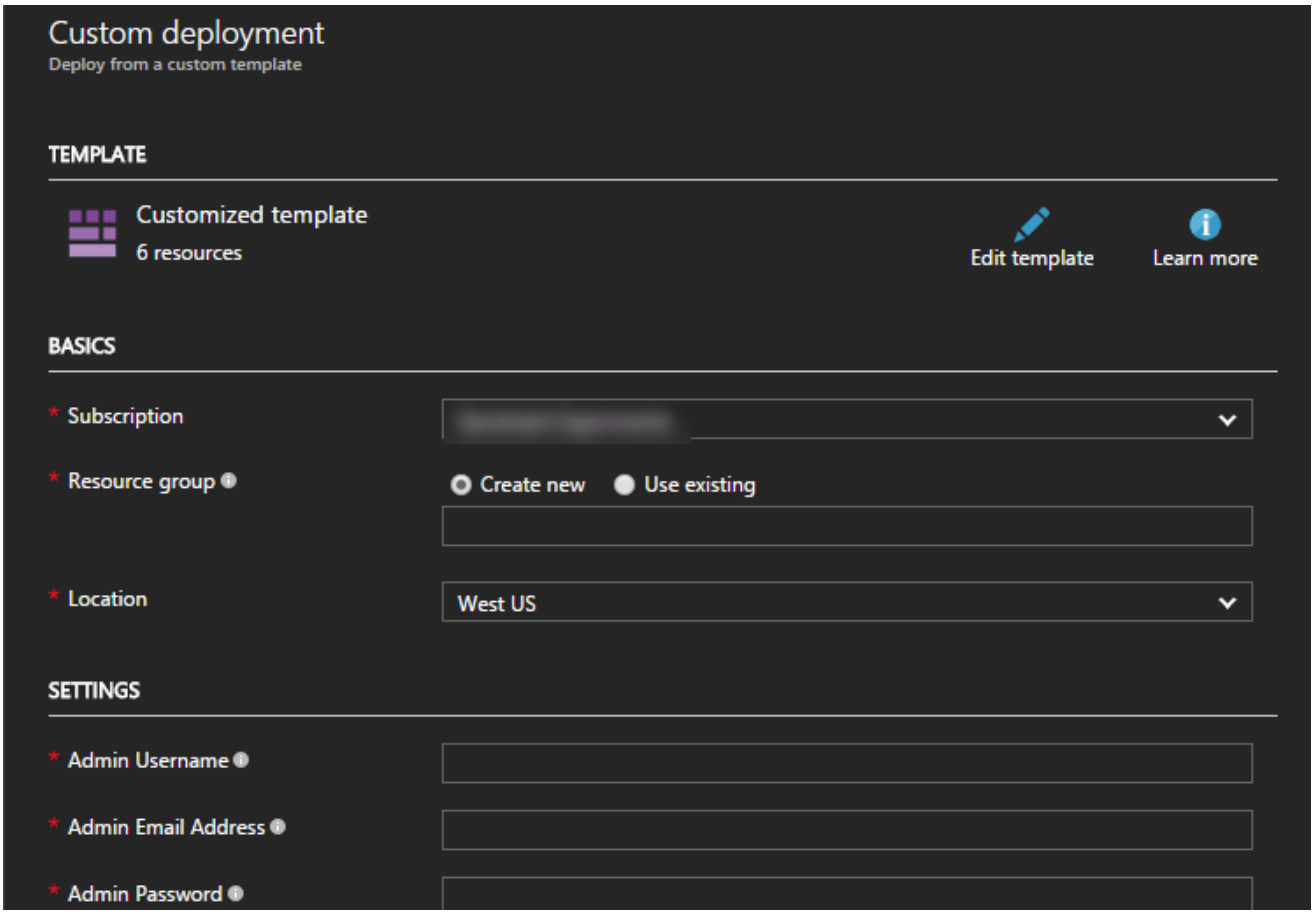
5.5 Launch the Quick start template.

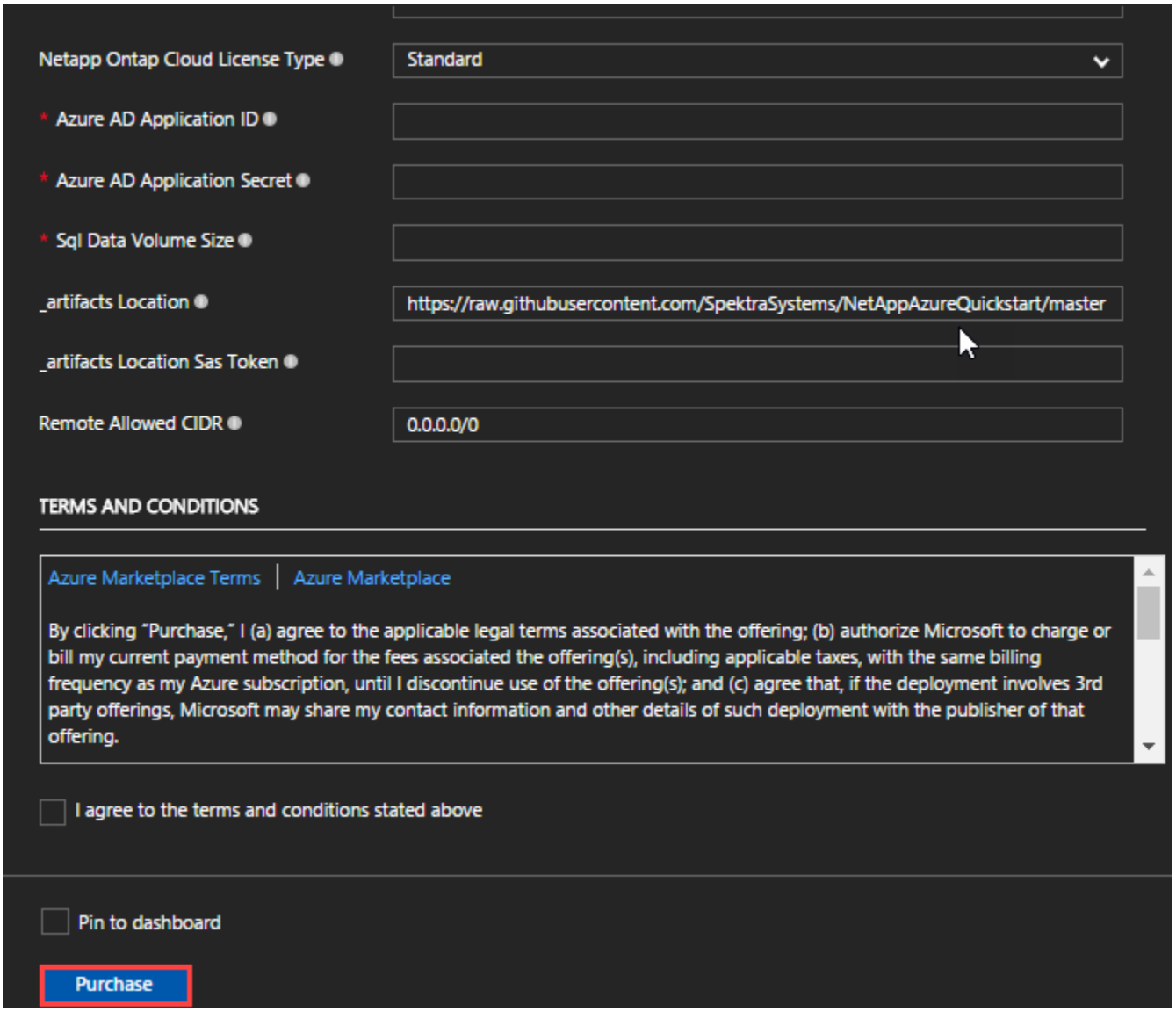
1. Navigate to https://github.com/SpektraSystems/NetAppAzureQuickstart/tree/master.
2. Launch the Template by click on **Deploy to Azure** button.



3. On clicking the Deploy to Azure button, you will be redirected to the Azure Portal. You have to enter the following details in the azure portal.

   Subscription: Choose your subscription.
   Resource group: Name of the resource group you wish to create.
   Location: Location in which you wish to deploy the template.
   Admin username: This Username will be used for all the VMs that are being created in this template.
   Admin Email Address: Enter your email address.
   Admin Email Password: Password used for VM login, OnCommand Manager Portal login and ONTAP VM password. Enter a password that is between 12 and 50 characters in length. The password must contain at least one English letter and one number. The password must not contain non-English letters or admin.
   Netapp ONTAP Cloud License Type: Standard/Premium
   Azure AD Application ID: Enter the value of the application ID value.
   Azure AD Application Secret: Enter the copied value of Application Key.
   Sql Data Volume Size: Enter the required size for Volume to be attached to the sql-vm via Netapp ONTAP cloud
   _artifacts Location: Leave default if unsure. The base URI where artifacts required by this template are located. When the template is deployed using the accompanying scripts, a private location in the subscription will be used and this value will be automatically generated.s
   _ artifacts Location Sas Token: Leave blank if unsure, the sasToken required to access _artifactsLocation. When the template is deployed using the accompanying scripts, a sasToken will be automatically generated.
   Remote Allowed CIDR: keep default.
   Check mark the "**I agree to the terms and conditions stated above**"
4. After entering all the values, click on **Purchase.** This will start the deployment.


Custom deployment
Deploy from a custom template
TEMPLATE
Customized template
6 resources
Edit template
Learn more
BASICS
* Subscription
* Resource group
Create new
Use existing
* Location
West US
SETTINGS
* Admin Username
* Admin Email Address
* Admin Password



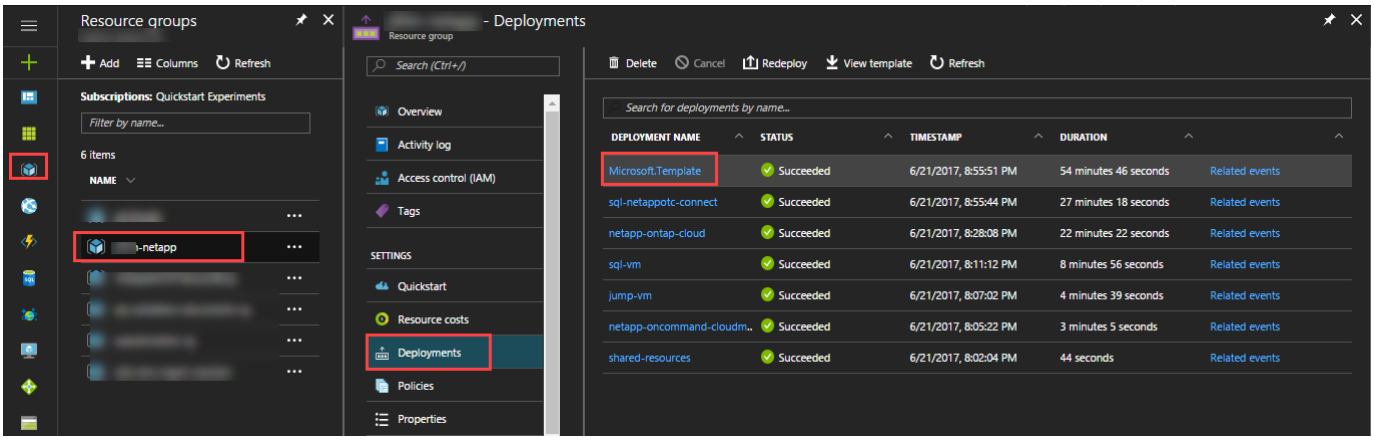
6. Deployment Time

The deployment takes about 1 hour.

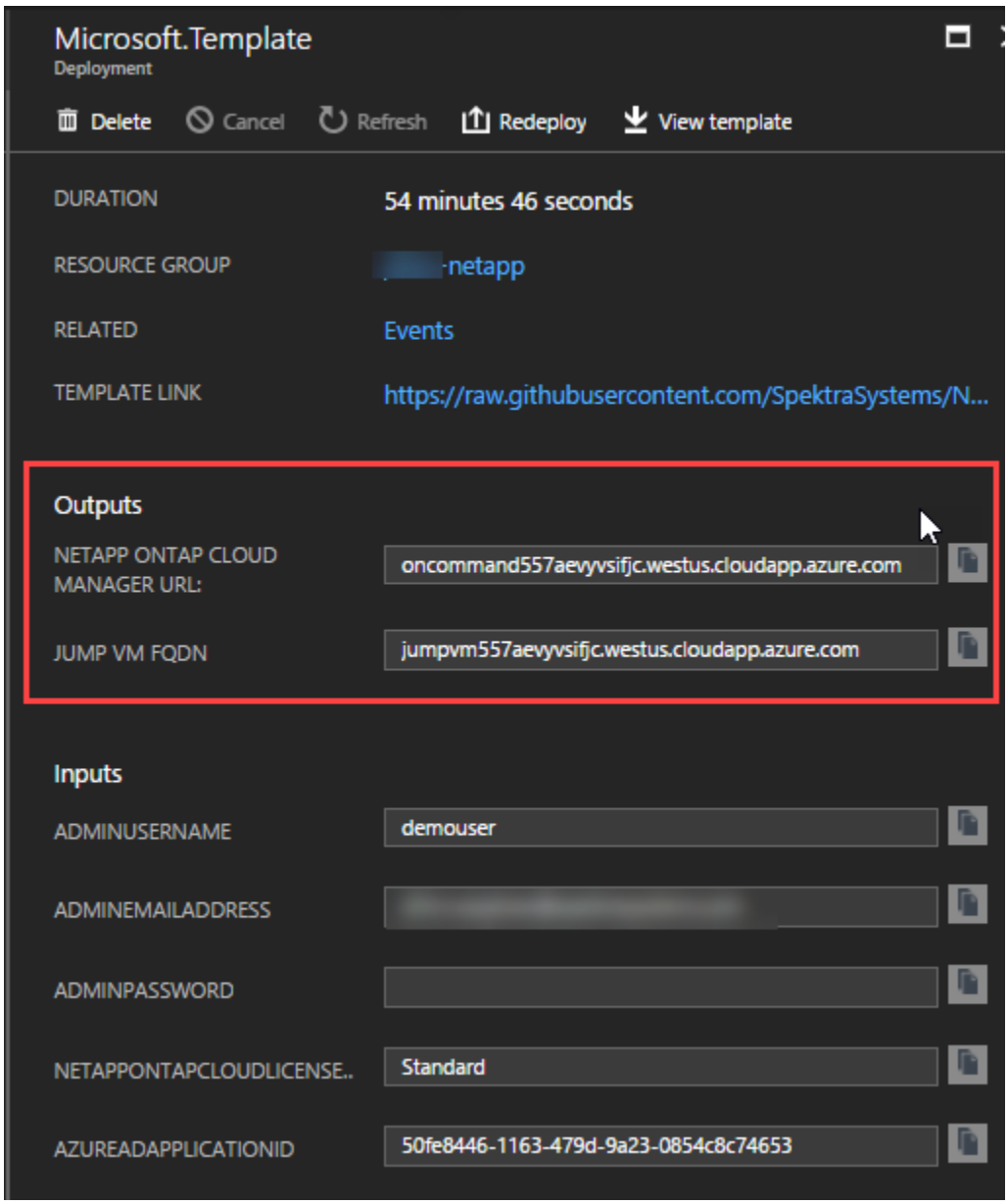
7. Post Deployment

7.1 Get the DNS name of ONTAP Cloud Manager

1. Go to the resource group in which the template was deployed.
2. In the **Settings** panel, click on **Deployments** and then click on **Microsoft.Template**

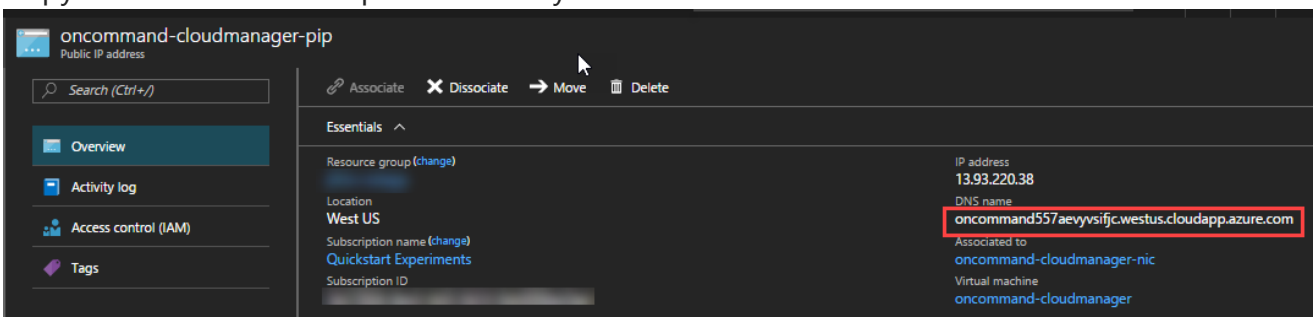


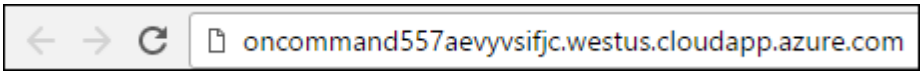
3. On clicking **Microsoft.Template,** the template outputs will be displayed.



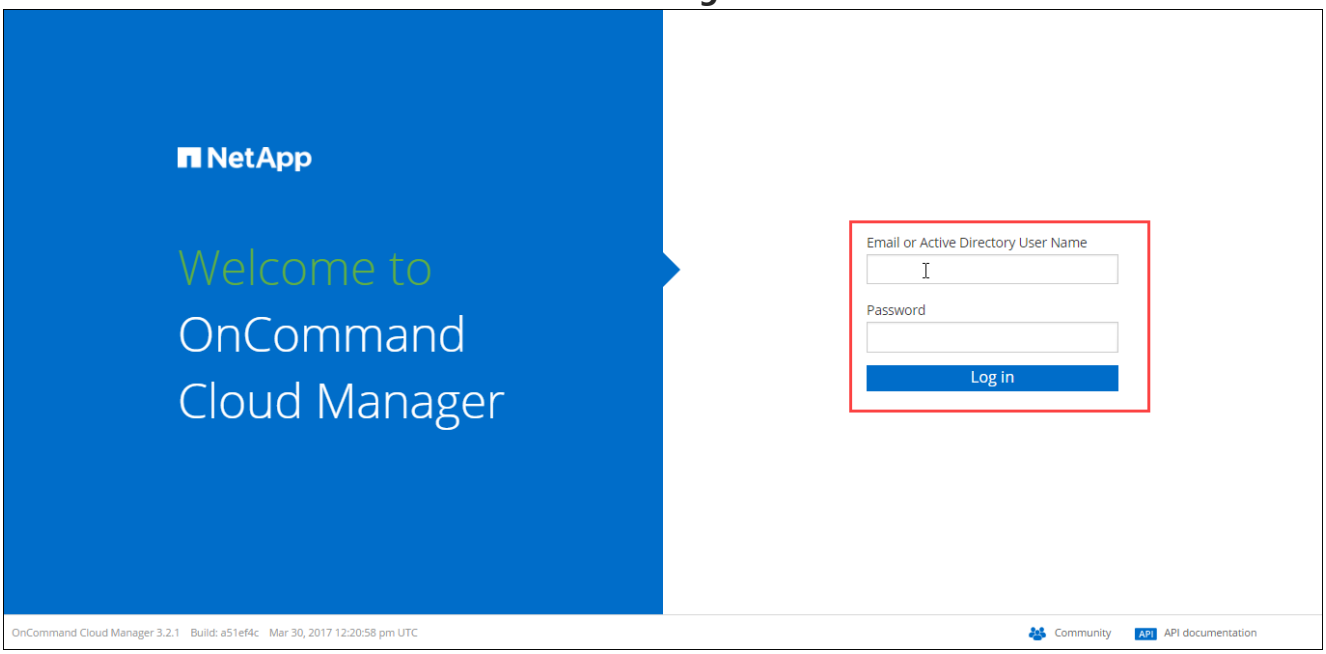
7.2 How to Access OnCommand Manager using GUI

1. Go to the resource group in which the template is deployed.
2. In the resource group click on **oncommand-cloudmanager-pip.**
3. Copy the DNS name and paste it on any browser.

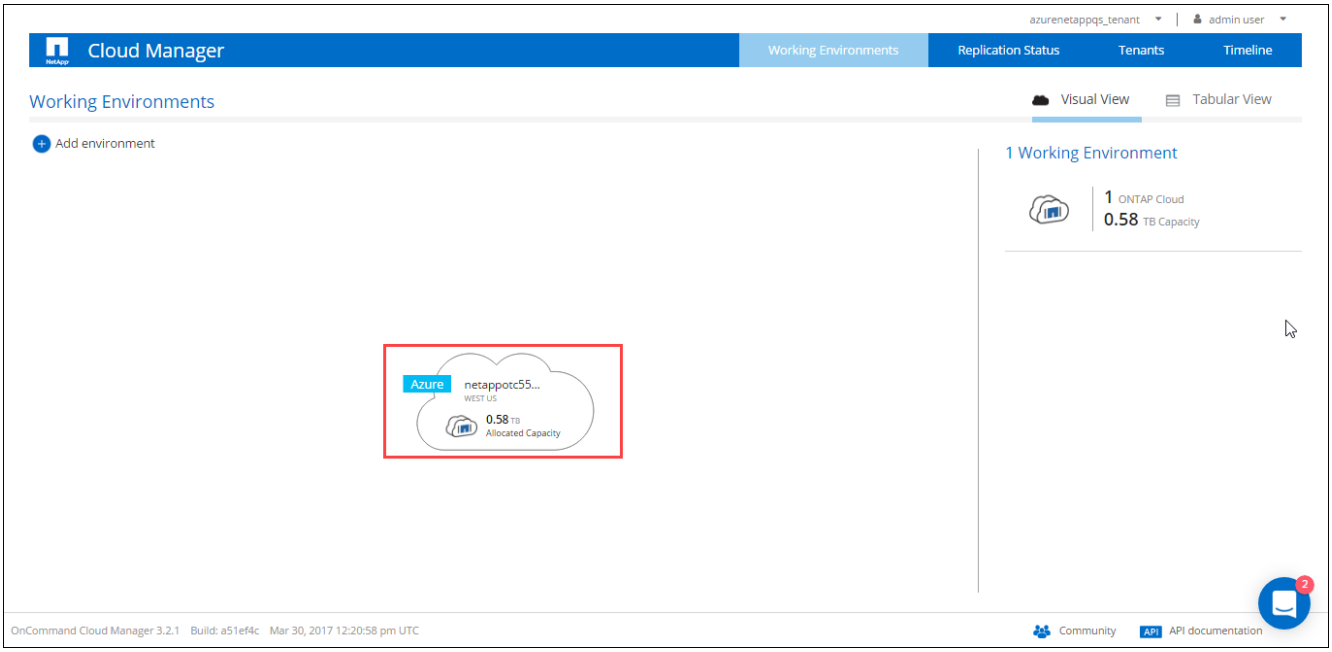




4. Enter the **Email ID** and **Password** and click on **Log In.**

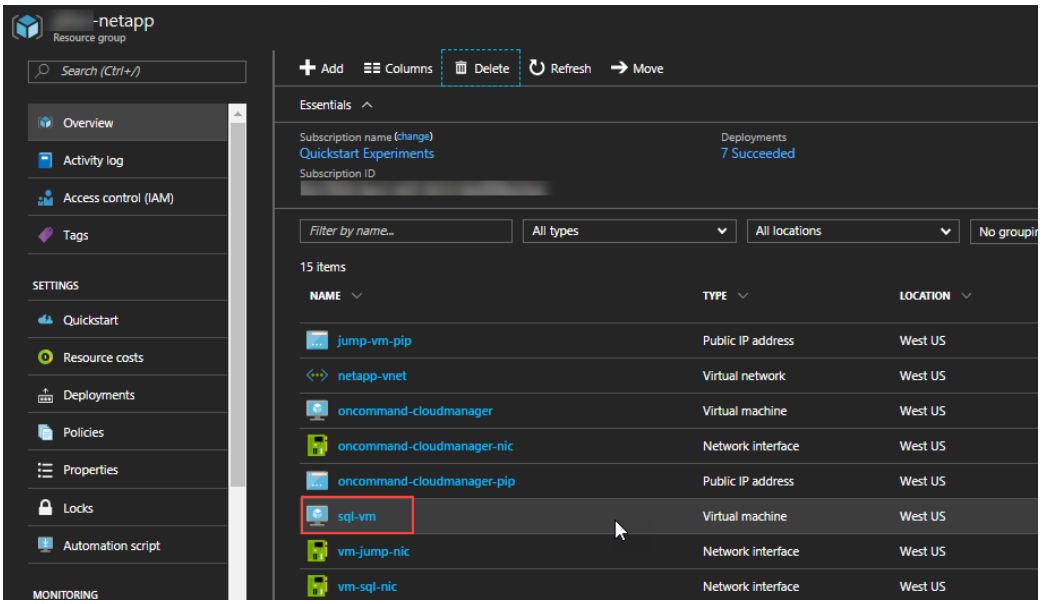


5. After logging, you will be directed to a page where the working environments are displayed. The working environment created by the Quick Start Template is displayed.

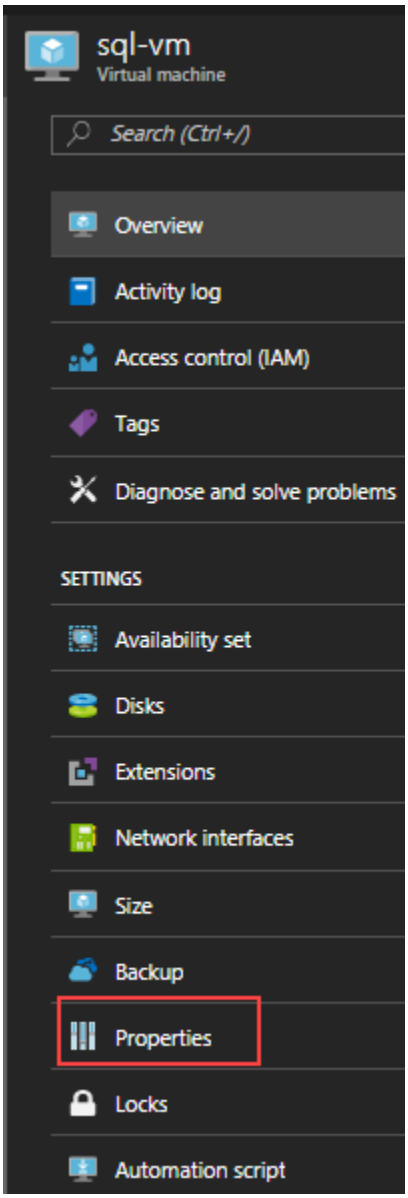


7.3 Access SQL VM and Verify NetApp Volumes

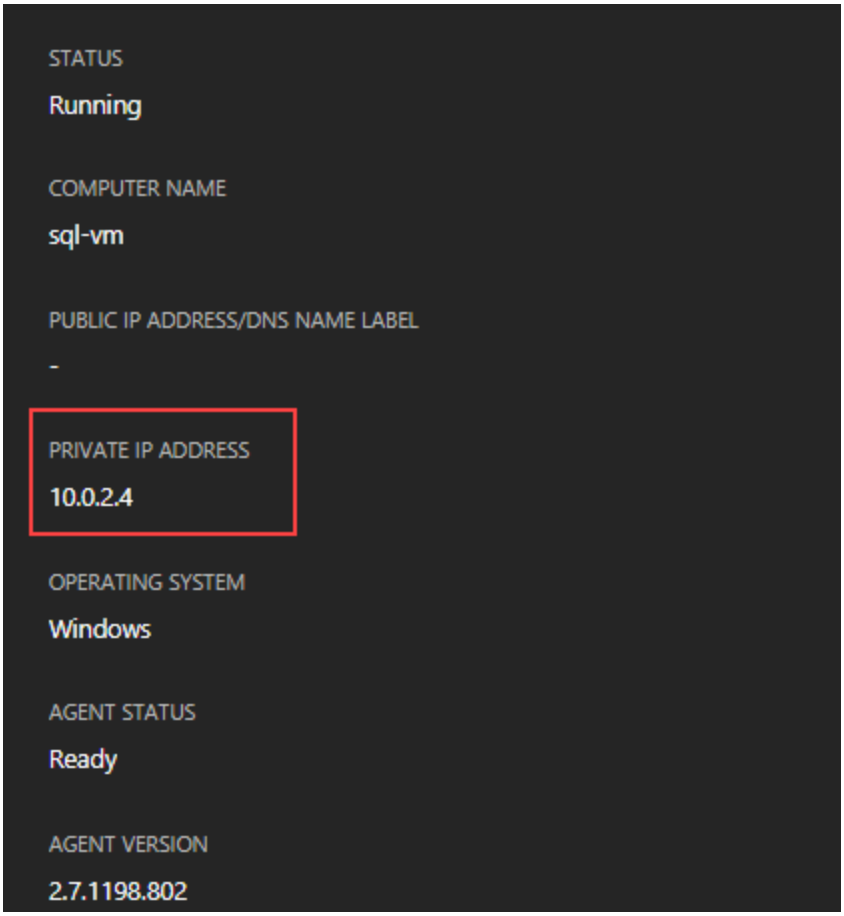
1. Go to the resource group that was created by the template. Click on the **sql-vm.**



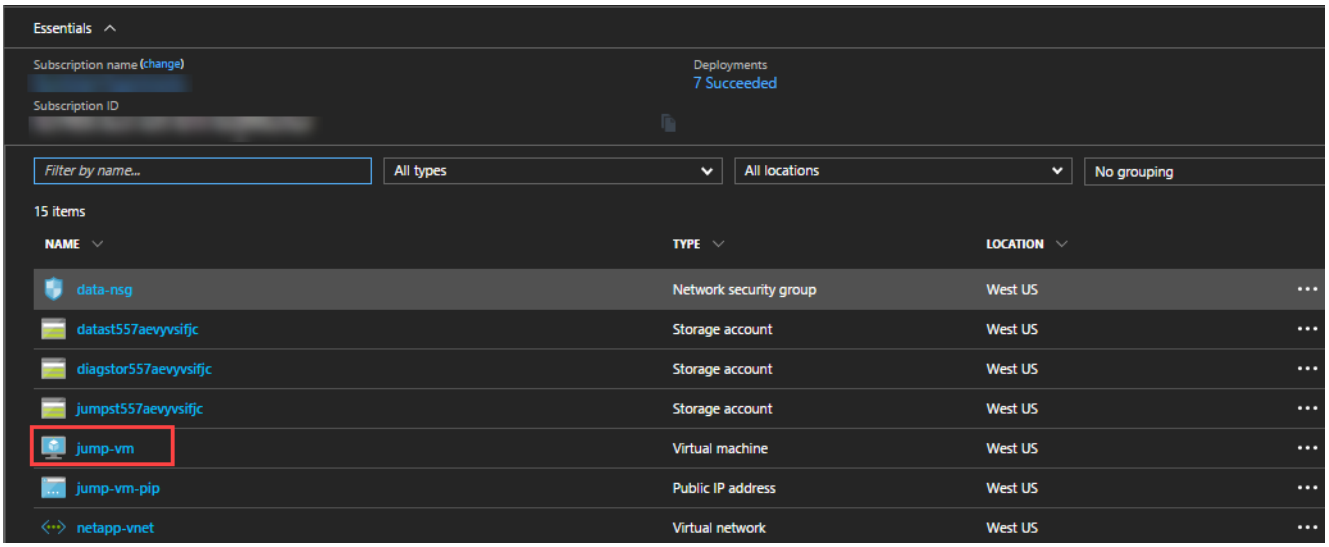
2. On the side bar, under the **Settings** section, click on **Properties.**



3. In the **Properties** section, copy the **Private IP address.**

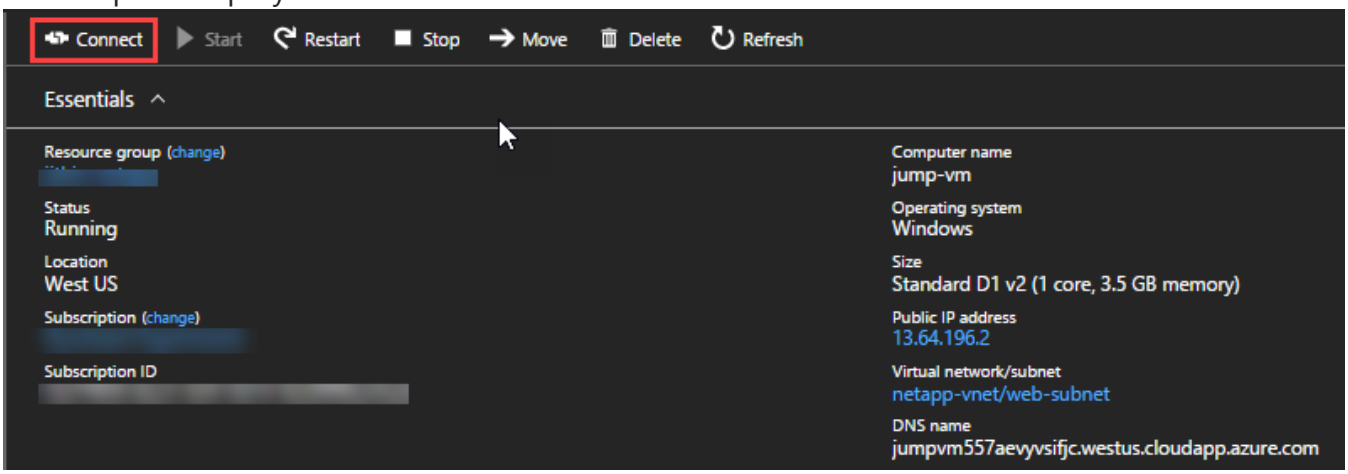


4. Now go to the resource group. Click on the **jump-vm.**

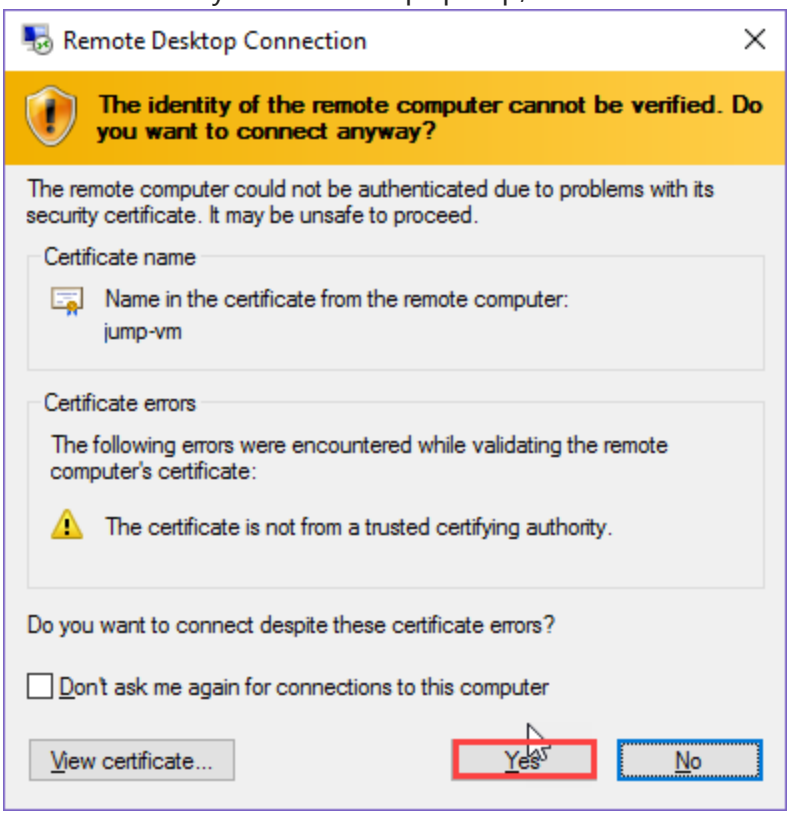


5. Click on the **Connect** button on the top. This will download the rdp file for connecting to jump-vm.

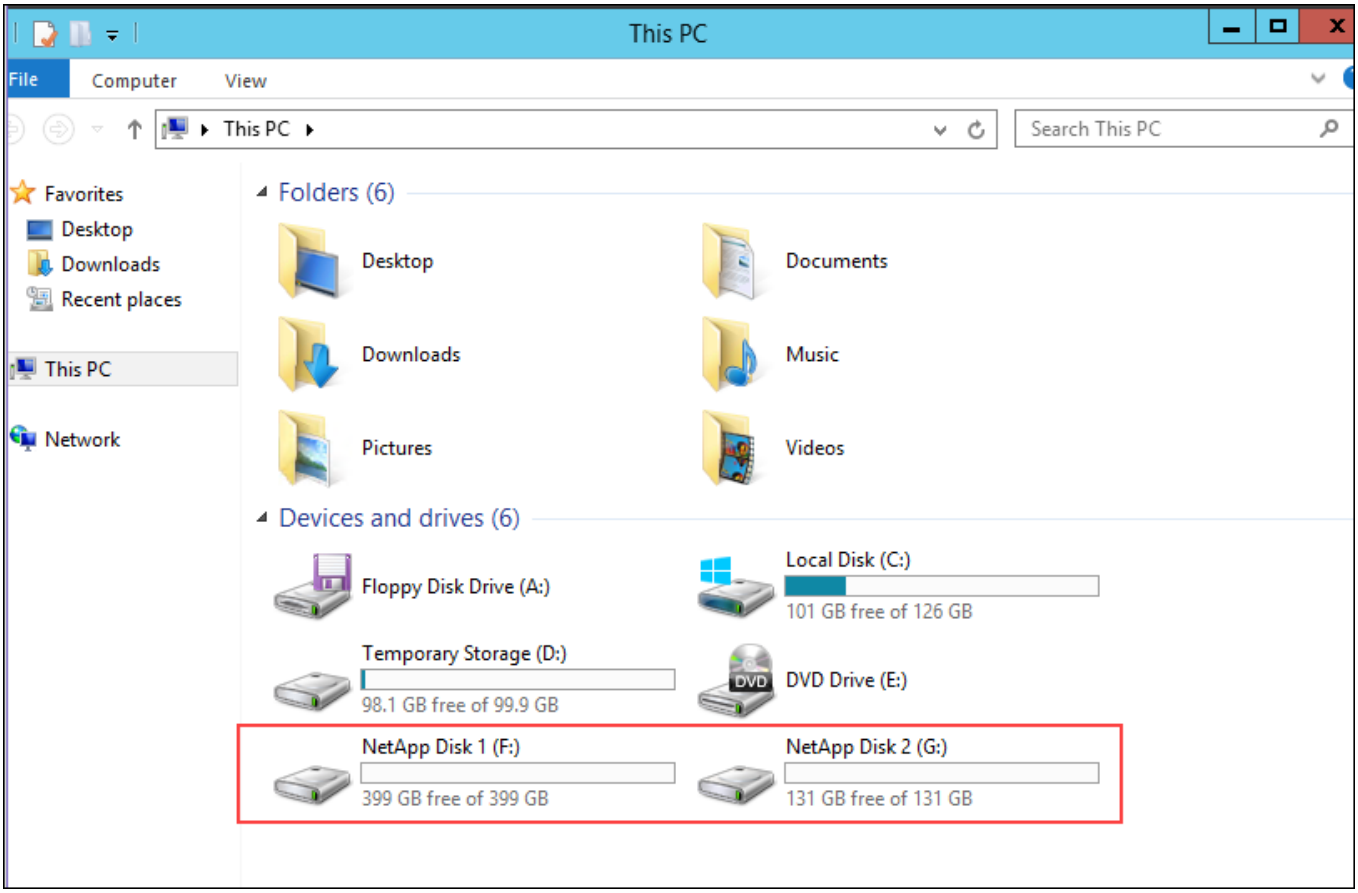
6. Click on downloaded rdp file, click on **Connect** and login using the credentials provided during the template deployment. W



hen the security notification pops up, click on **Yes.**

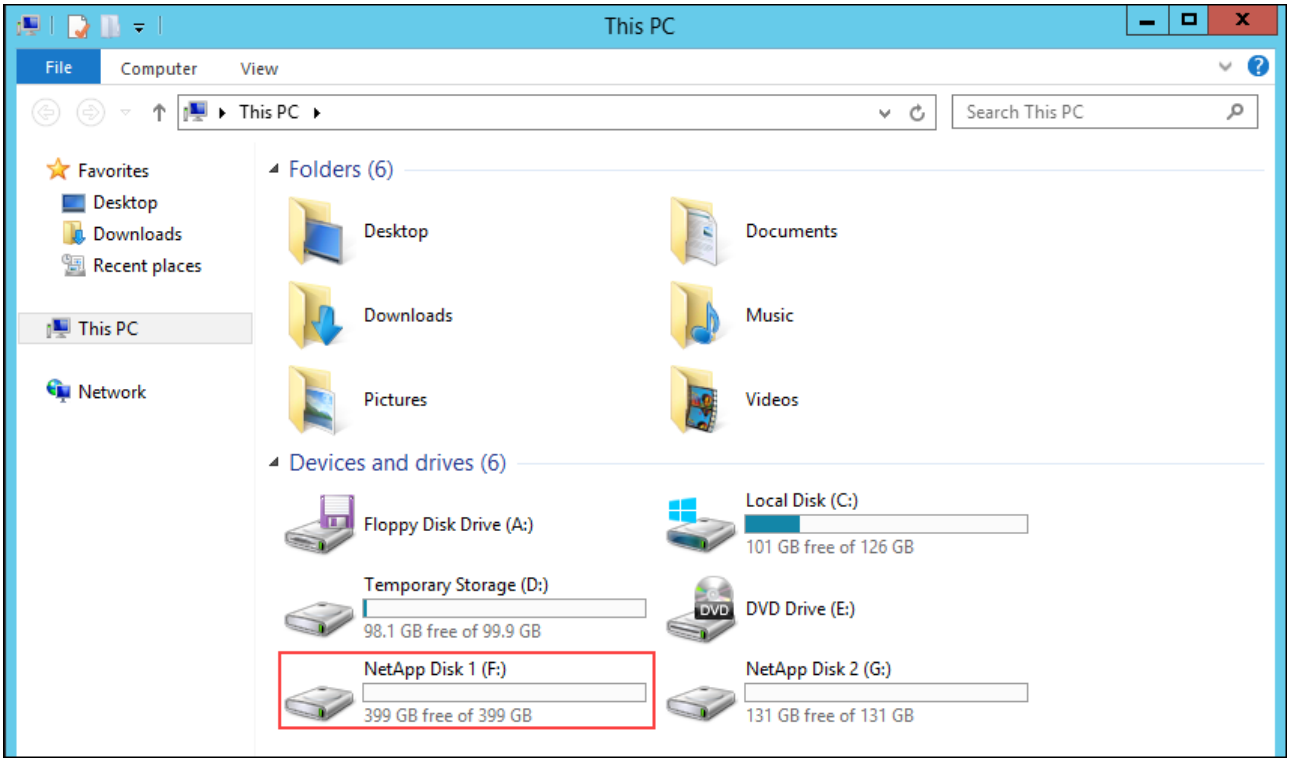


7. Now you are logged into the jump-vm. Inside the jump-vm search for **Remote Desktop Connection.**
8. In the rdp connection window, paste the **Private ip address** of the **sql-vm** that was copied during **Step 3**.
9. In the Remote Desktop Connection window, the username and password as provided during the time of deployment.
10. Once you are in the sql-vm go to **This PC.** Here you can see the two new netapp volumes mounted.



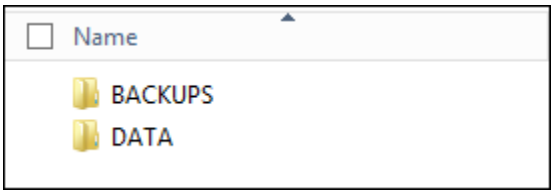
7.4 Viewing the Database backup file.

1. Login to the **sql-vm** via the **jump-vm**. Go to **This PC** and click on **NetApp Disk 1**.

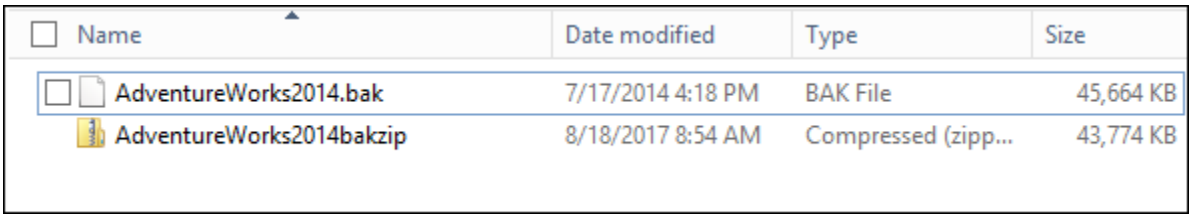


2. Click on the **SQL** folder inside the **NetApp Disk 1**.

3. Inside the **SQL** folder, you can see two folders. **Click** on the **BACKUPS** folder.



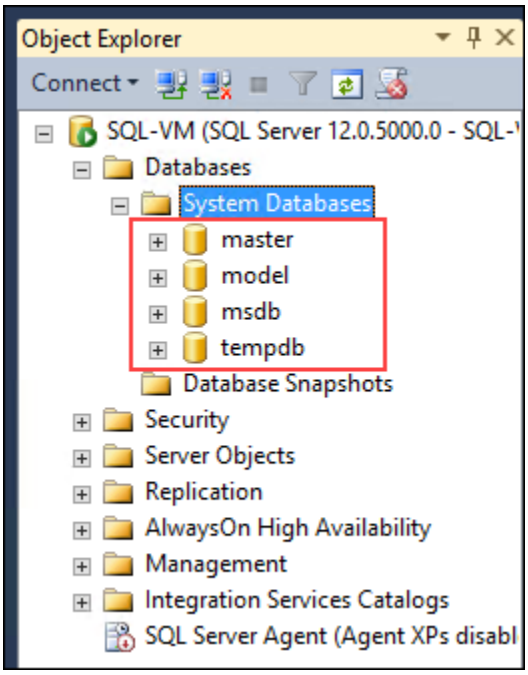
4. Inside the folder, you will see the backup file.



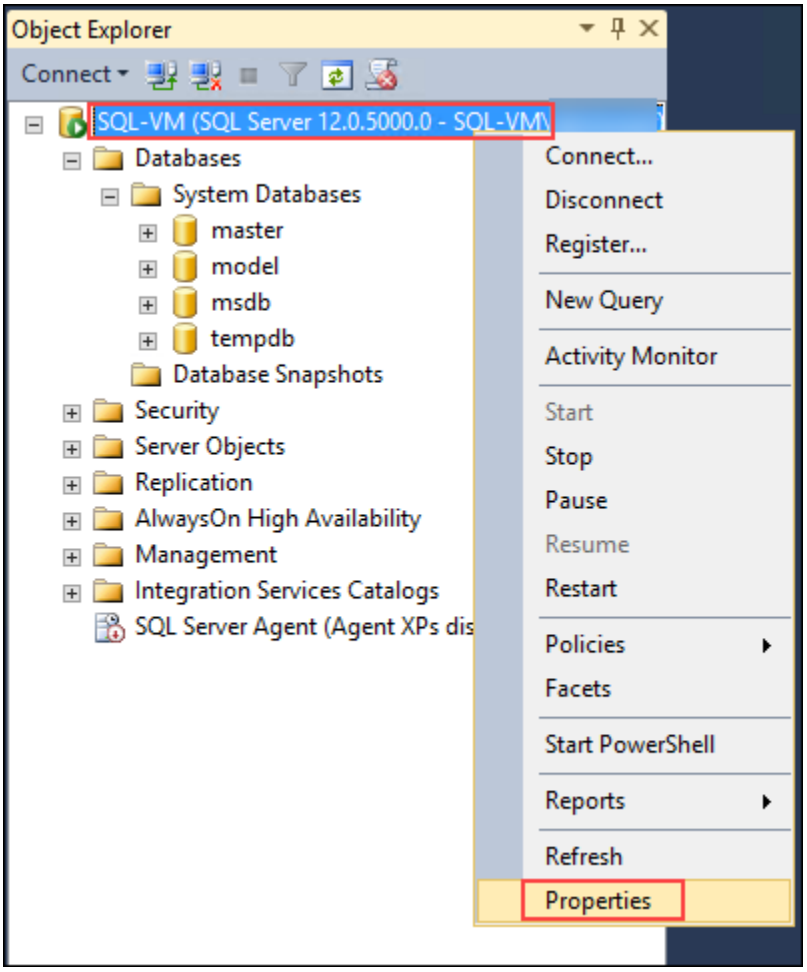
5. The logs will be stored inside the **NetApp Disk 2**.

7.5 Viewing the Database architecture.

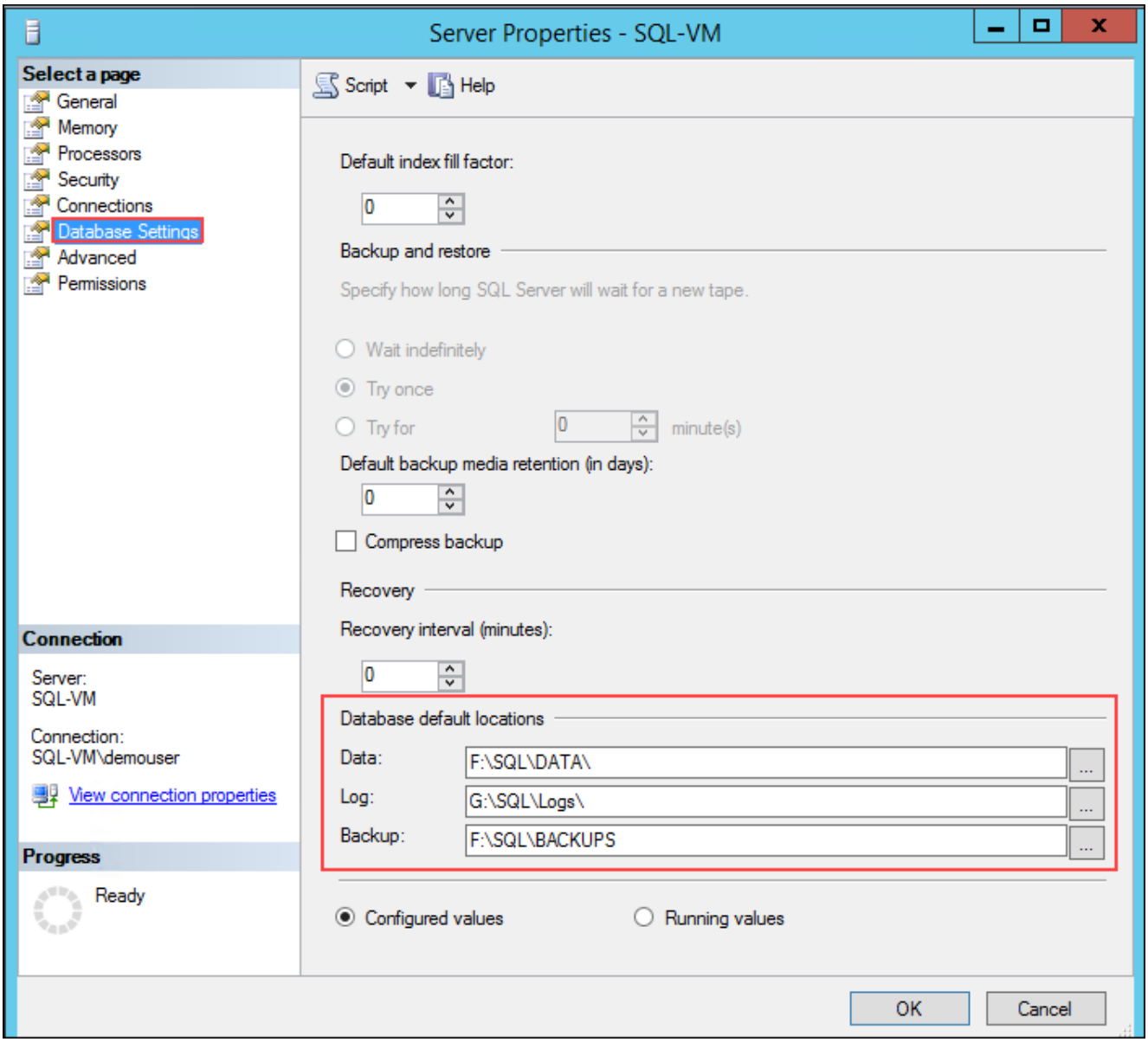
1. Login to the **sql-vm** via the **jump-vm.**
2. Open the **SQL Server 2014 Management Studio.**
3. Click on **Databases** and then **System Databases.**



4. To view the Default database settings, enter the **SQL Server 2014 Management Studio** and right click on the **SQL-VM(SQL Server 12.0.5000.0-SQL-VM\username).** Click on **Properties.**

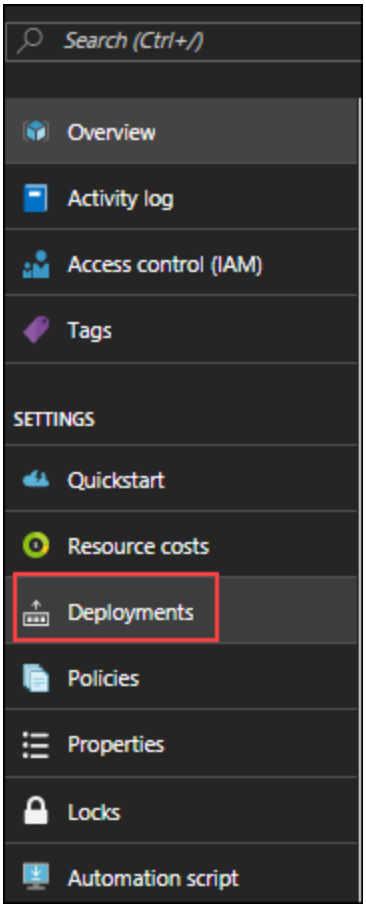


5. Click on **Database Settings.** The **Database default locations** will be displayed.

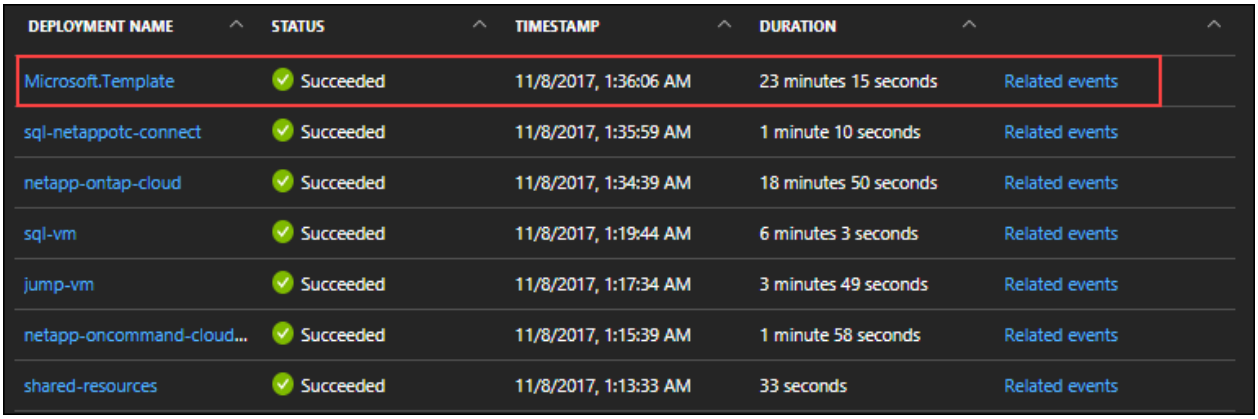


7.6 Retrieving NetApp ONTAP Cloud SVM Password.

6. Go to the resource group that was created by the template.
7. In the resource group, on the side bar, **click** on **Deployments.**

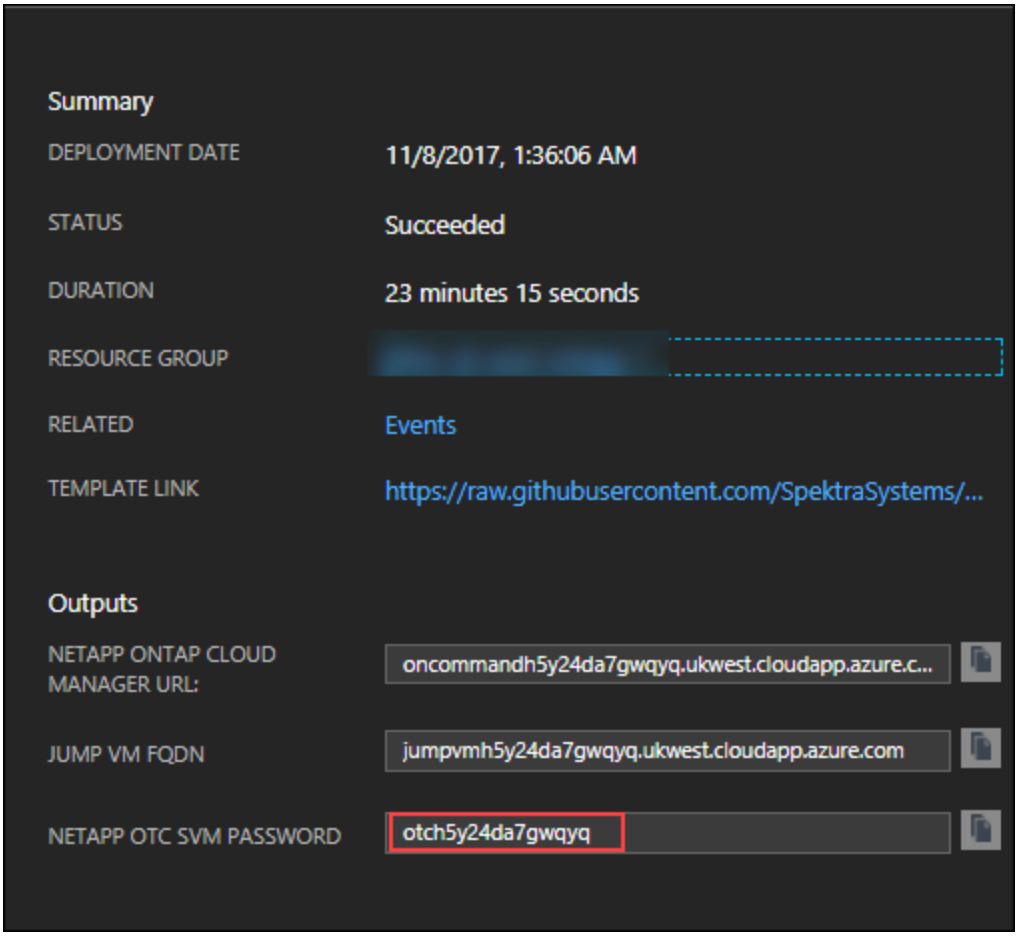


8. On clicking Deployments, you will be redirected to the list of deployments. **Click** on **Microsoft.Template**.



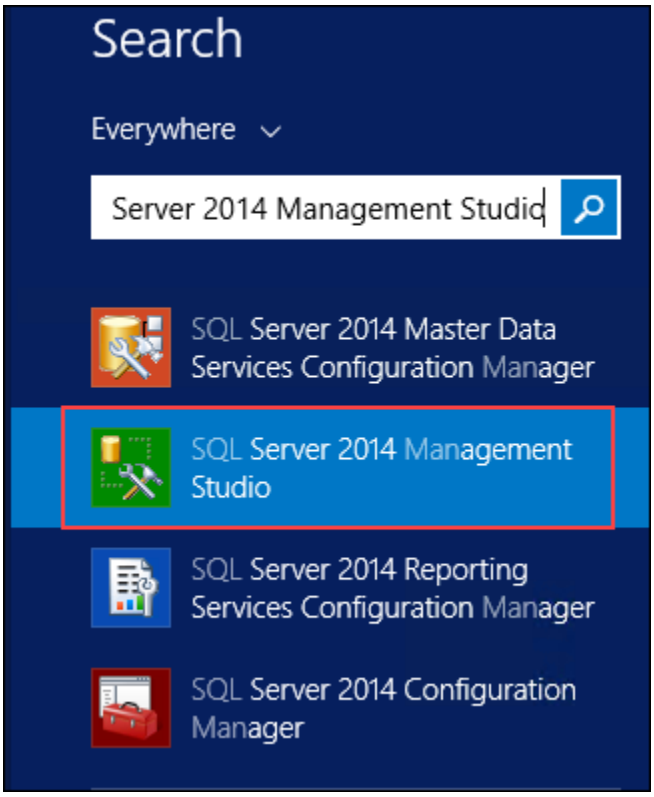
DEPLOYMENT NAME	STATUS	TIMESTAMP	DURATION	
Microsoft.Template	Succeeded	11/8/2017, 1:36:06 AM	23 minutes 15 seconds	Related events
sql-netappotc-connect	Succeeded	11/8/2017, 1:35:59 AM	1 minute 10 seconds	Related events
netapp-ontap-cloud	Succeeded	11/8/2017, 1:34:39 AM	18 minutes 50 seconds	Related events
sql-vm	Succeeded	11/8/2017, 1:19:44 AM	6 minutes 3 seconds	Related events
jump-vm	Succeeded	11/8/2017, 1:17:34 AM	3 minutes 49 seconds	Related events
netapp-oncommand-cloud...	Succeeded	11/8/2017, 1:15:39 AM	1 minute 58 seconds	Related events
shared-resources	Succeeded	11/8/2017, 1:13:33 AM	33 seconds	Related events

9. You can see the **NETAPP OTC SVM PASSWORD** among the outputs of the template.

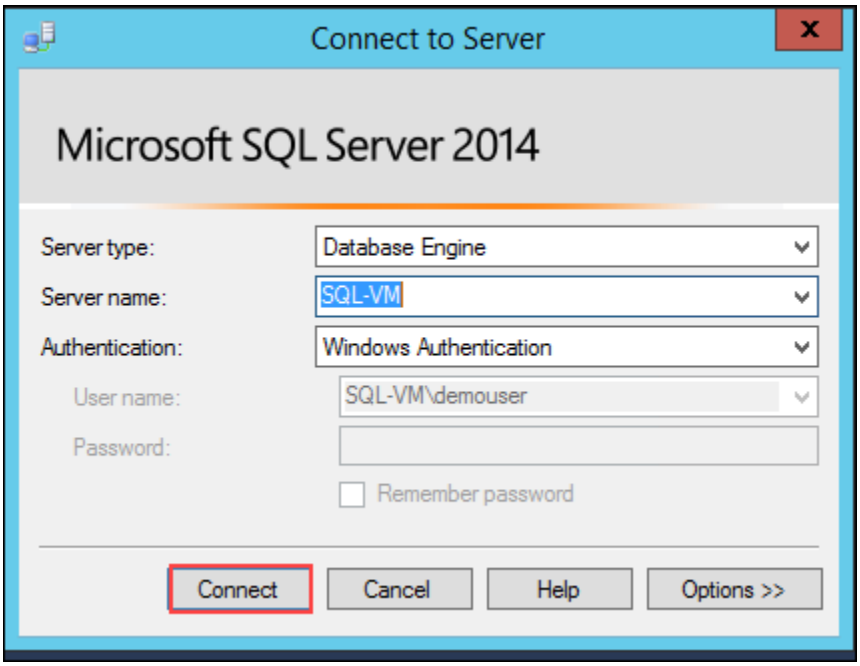


7.7 Restoring databases using the SQL Management Studio

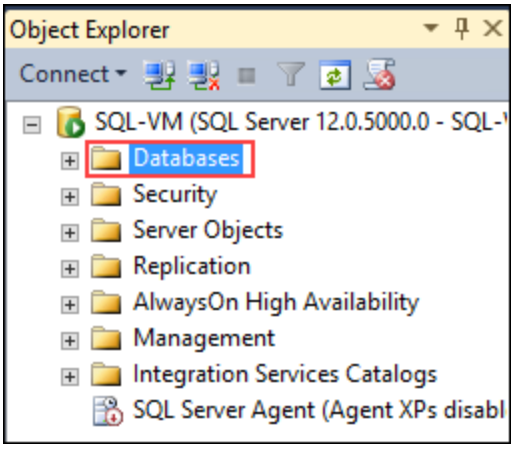
1. Log in to the **sql-vm** via the **jump-vm**.
2. In the **sql-vm** search for **SQL Server 2014 Management Studio**. Open the **SQL Server 2014 Management Studio.**



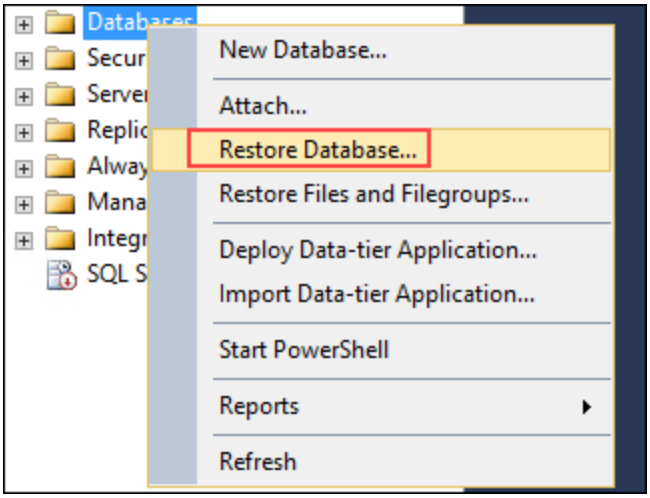
3. A popup window will appear as follows. Click on **Connect.**



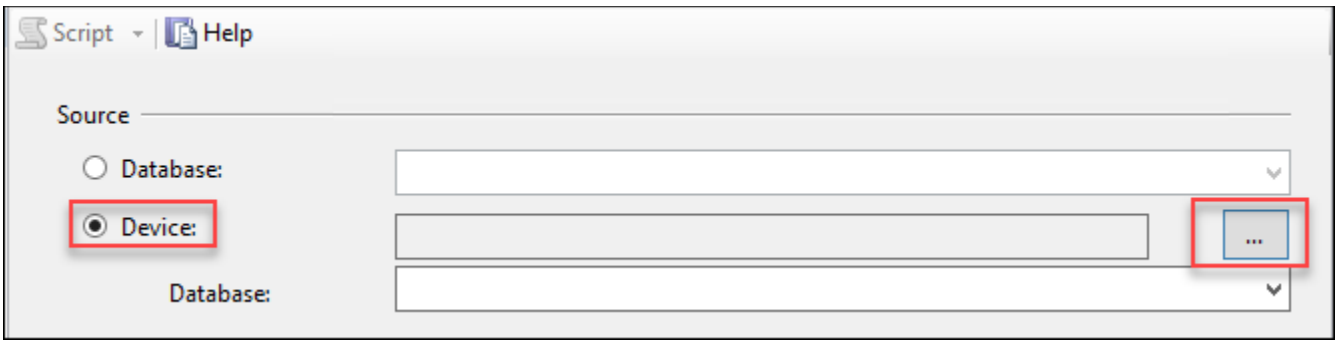
4. In the **SQL Server 2014 Management Studio,** right click on the **Databases** button.



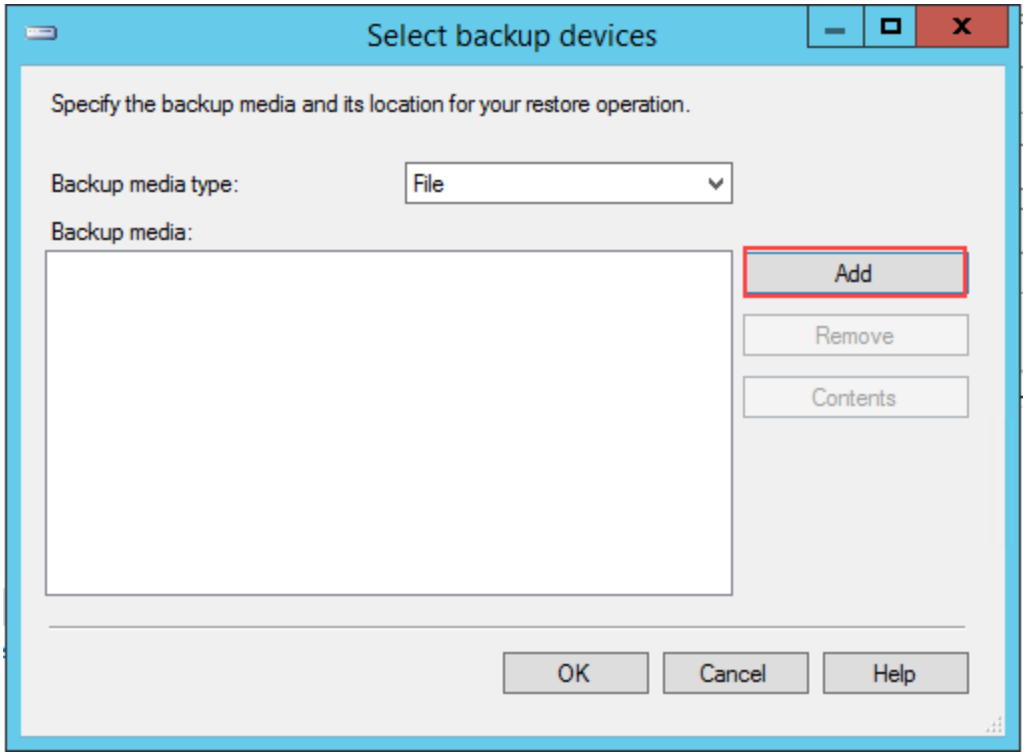
5. Click on the **Restore Database**.



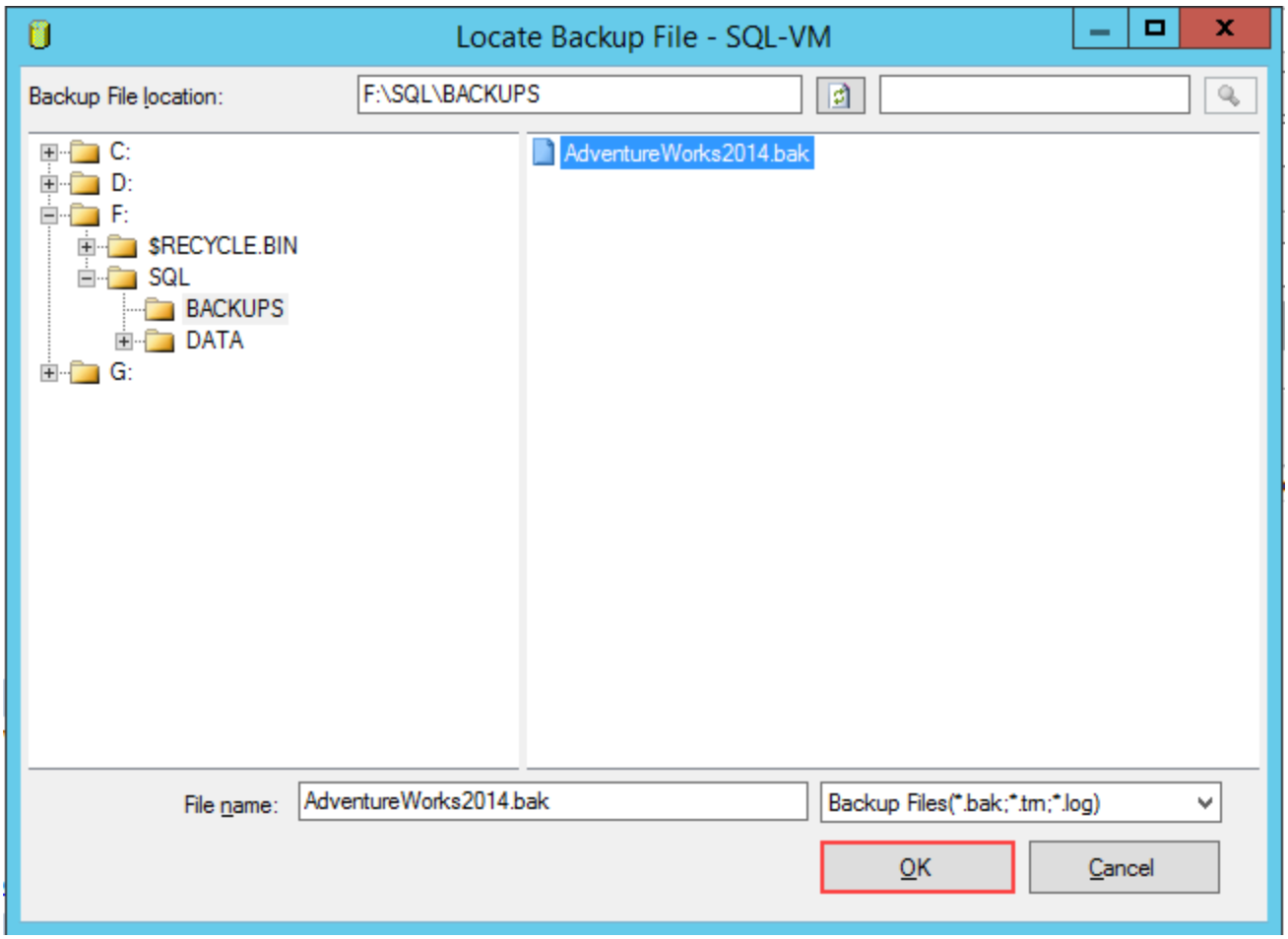
6. Select **Device,** and click on '**...**' button.



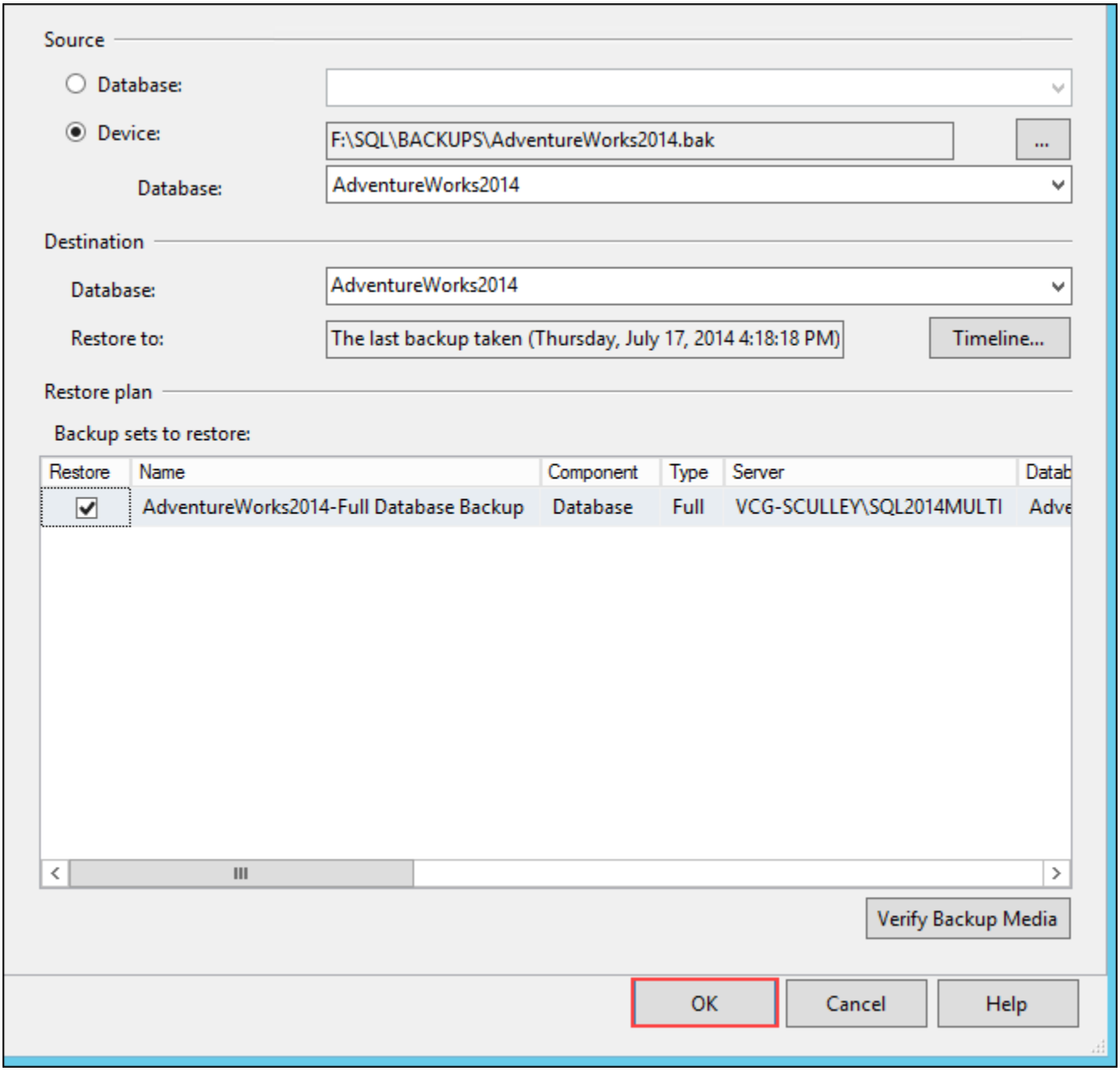
7. On the window that pops up, **click** on **Add**.



8. Select **AdventureWorks2014.bak** and click on **OK.**



9. **Click** on **OK.**

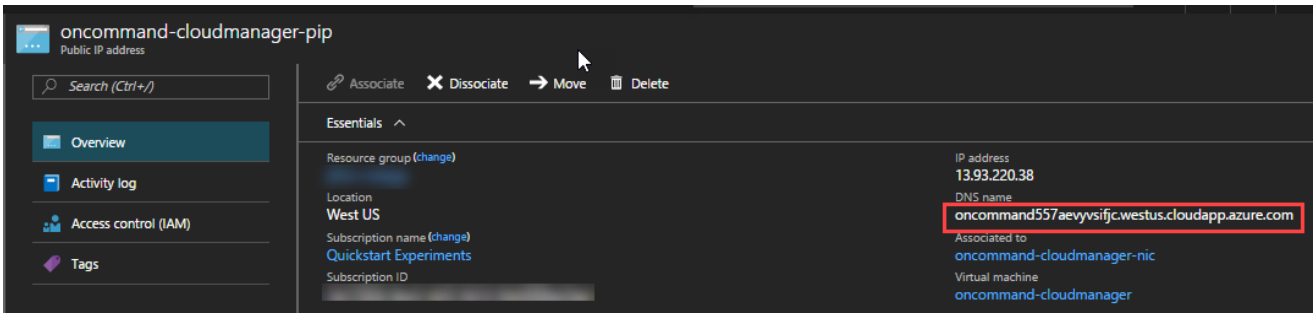


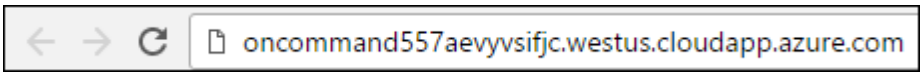
10. The databases will be restored successfully.

8. Creating Additional Volumes

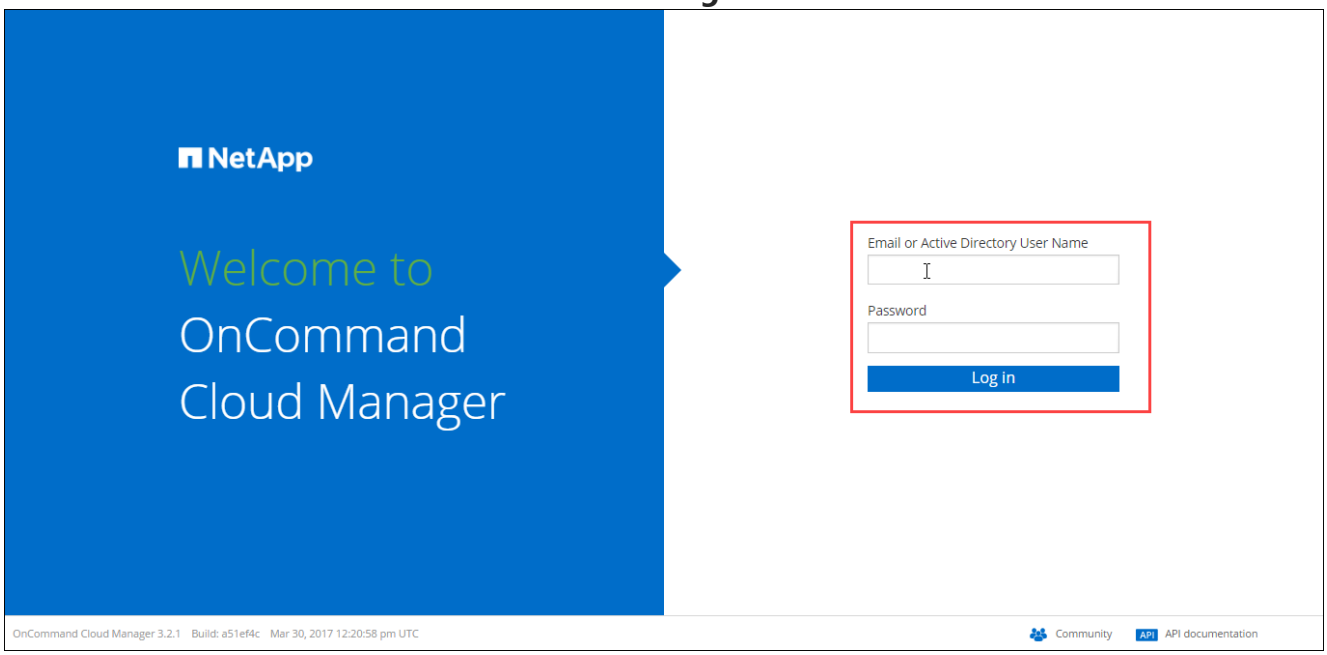
8.1 Creating Additional Volumes

1. Go to the resource group in which the template is deployed.
2. In the resource group click on **oncommand-cloudmanager-pip.**
3. Copy the DNS name and paste it on any browser.

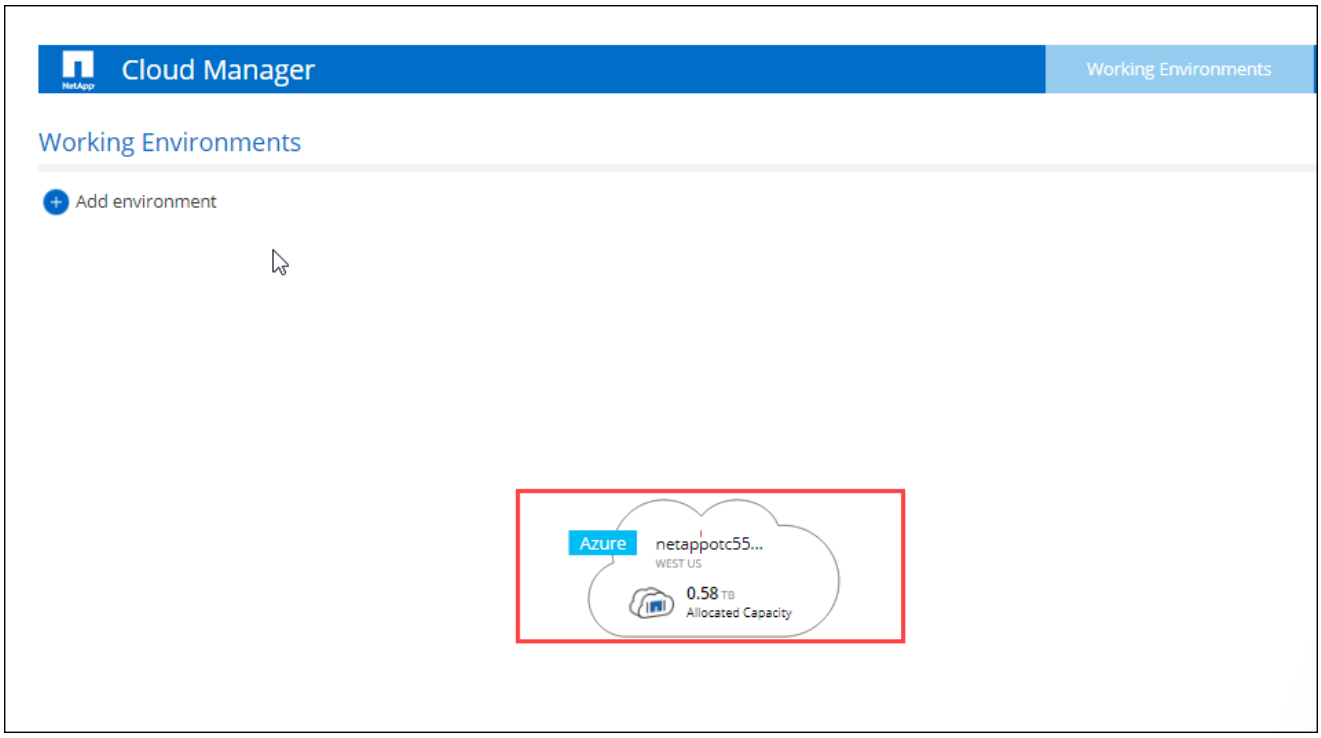




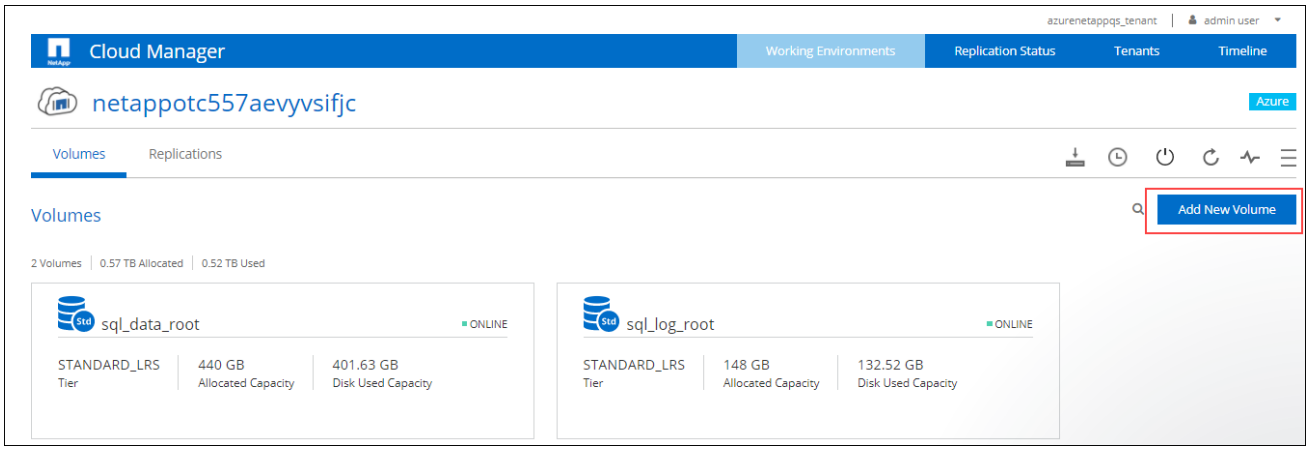
4. Enter the **Email ID** and **Password** and click on **Log In.**



5. Now that you are logged into the OnCommand Manager, double click on the **environment** that was created by the template.



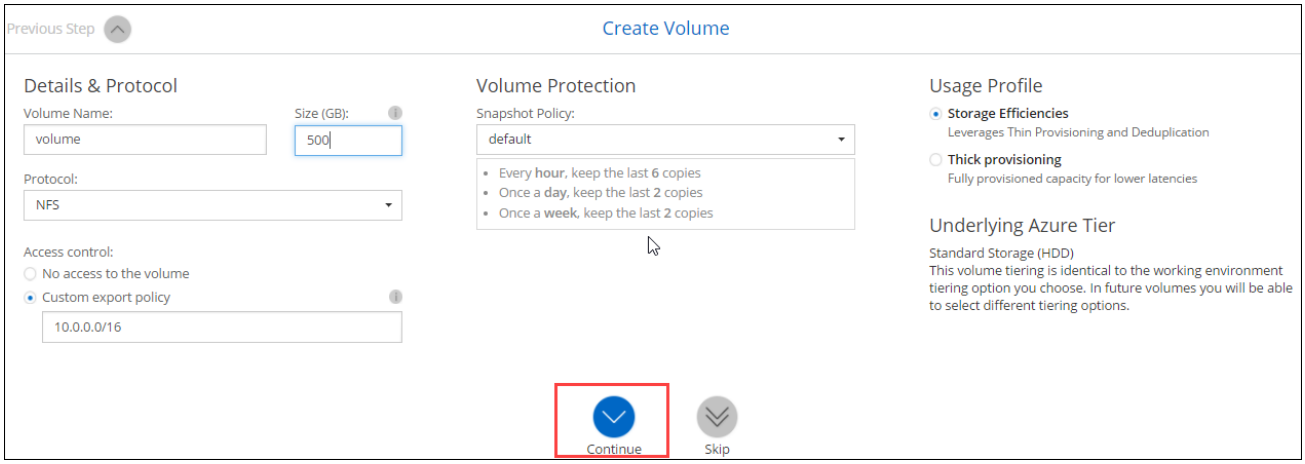
6. Click on **Add New Volume.**



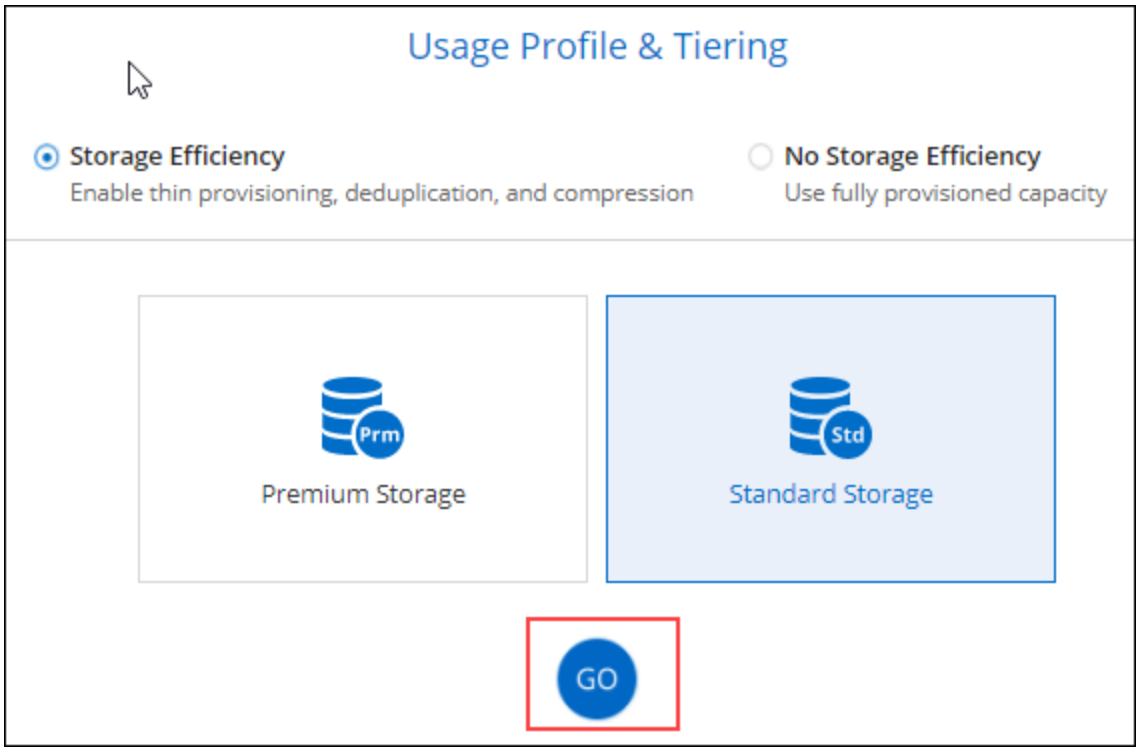
7. Enter the following details:

   Volume Name: Name of the volume to be created.
   Size: Size of the volume to be created.
   Protocol: NFS/CIFS
   Access control: Custom export policy
   Snapshot Policy: default
   Usage Profile: Storage Efficiencies.

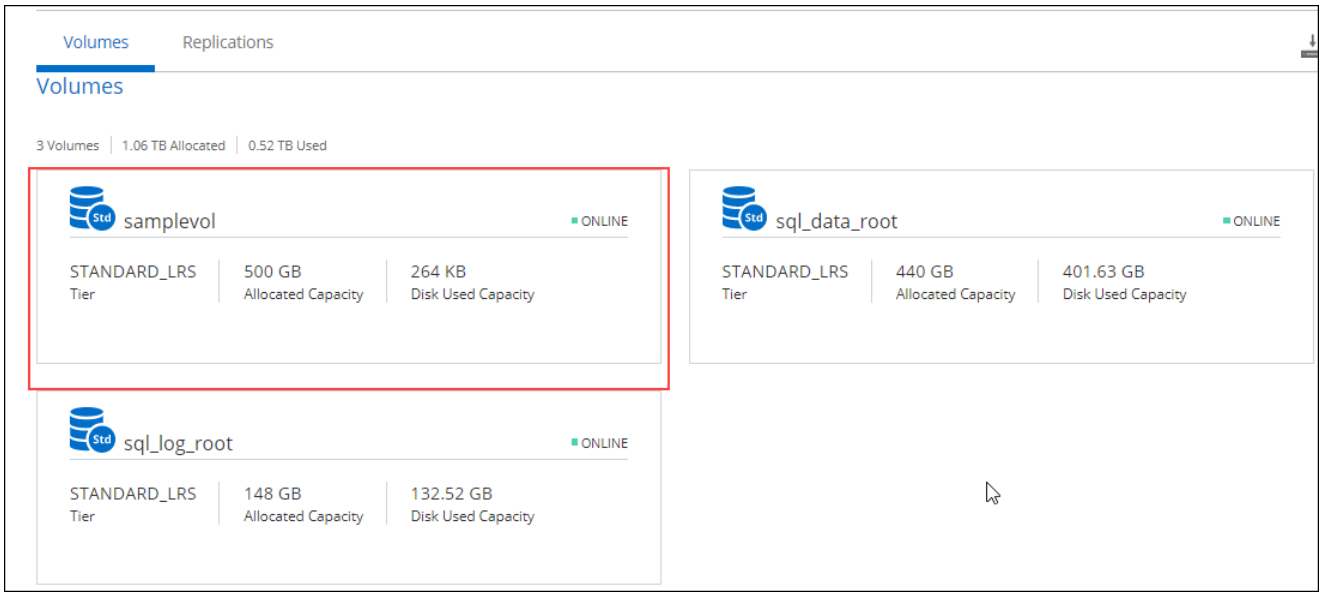
Click on **Continue.**



8. Select the type of storage needed and click on **GO.**



9. The volume is now created.

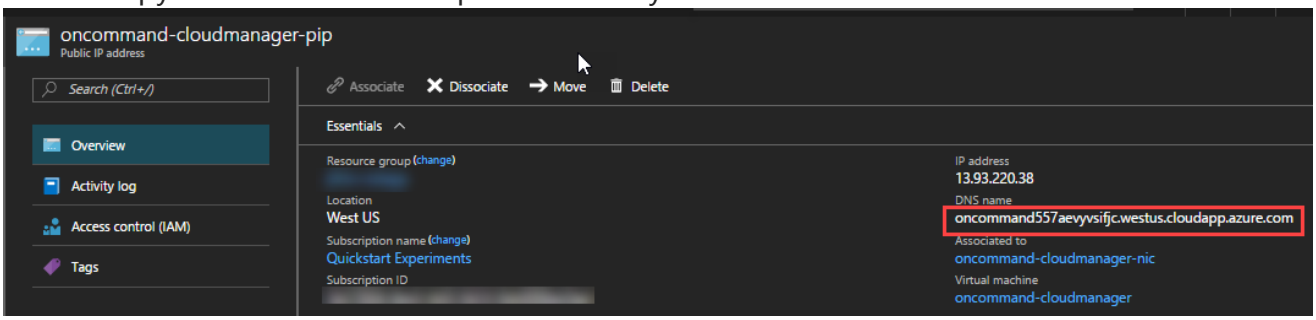


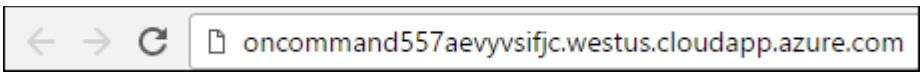
9. Cleaning Up

When you complete your work with ONTAP Cloud on Azure, you can clean up your account. Please follow the steps to clean up.

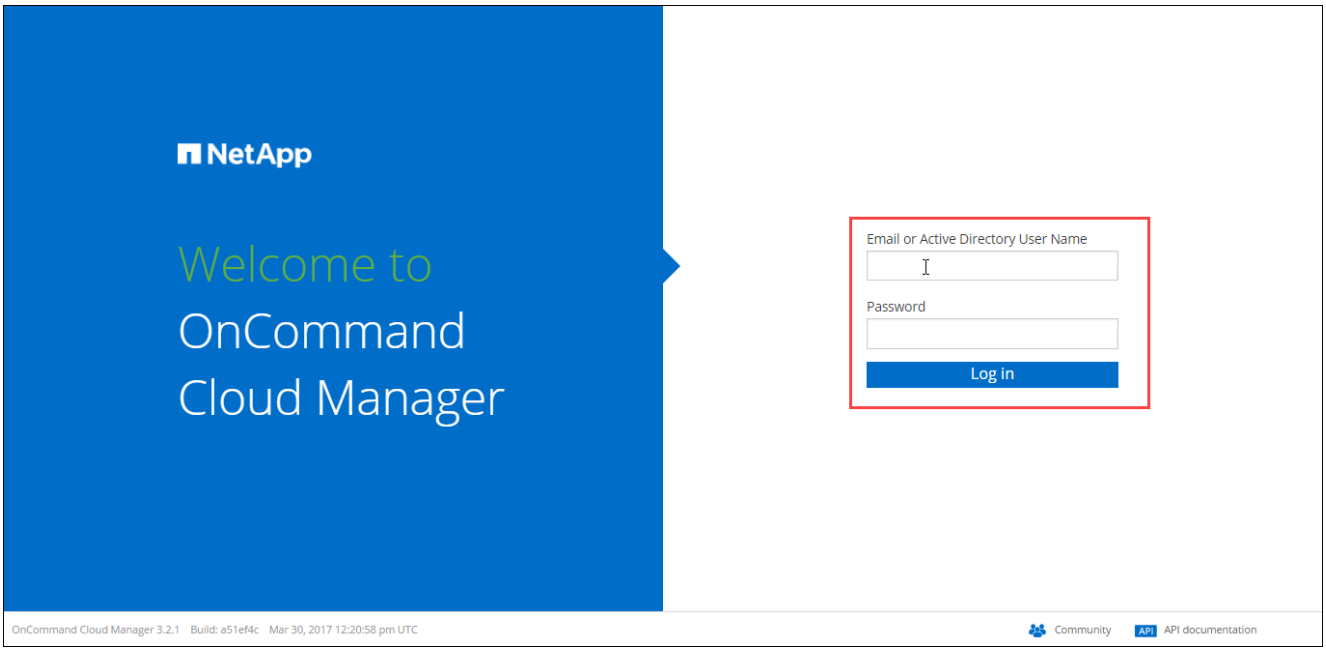
9.1 Removing the ONTAP Cloud System using GUI

10. Go to the resource group in which the template is deployed.
11. In the resource group click on **oncommand-cloudmanager-pip.**
12. Copy the DNS name and paste it on any browser.

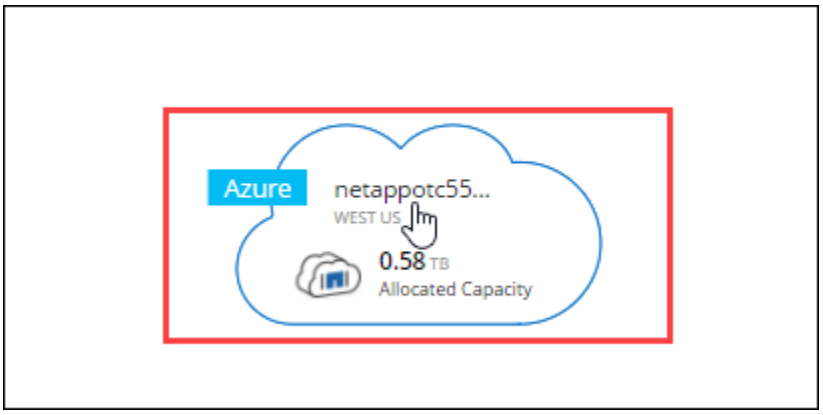




13. Enter the **Email ID** and **Password** and click on **Log In.**

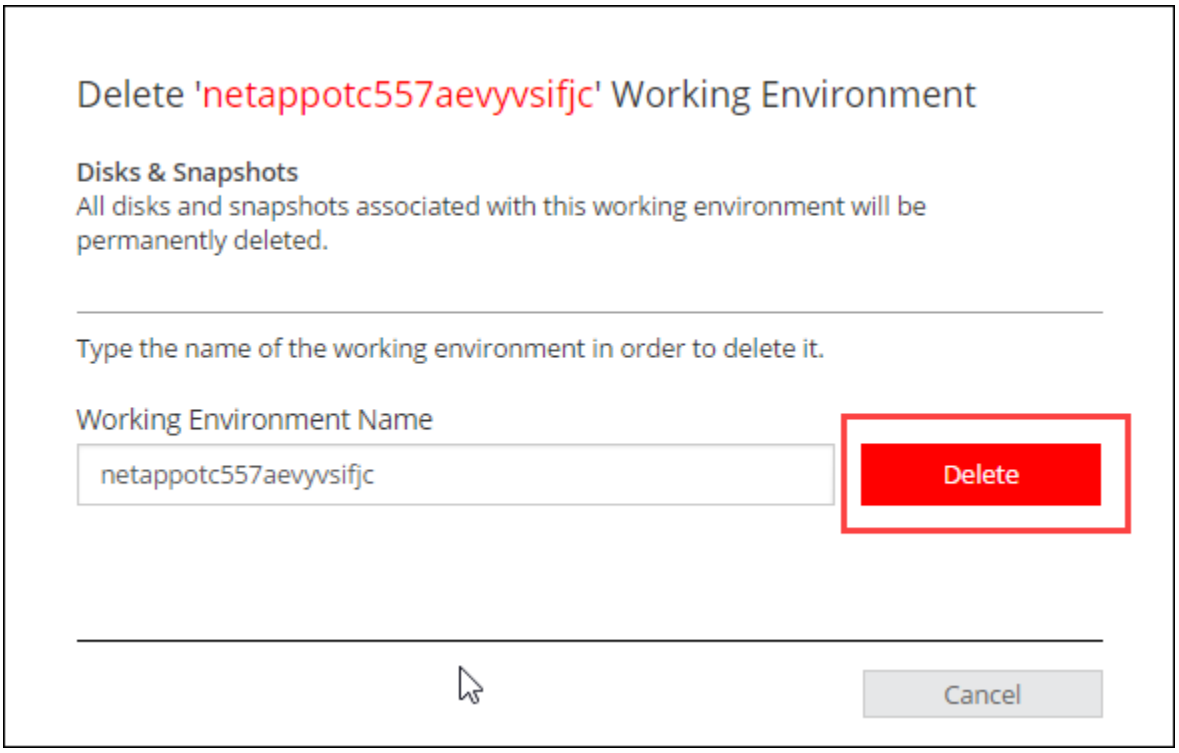


14. Double click on the ONTAP environment that was created using the template.



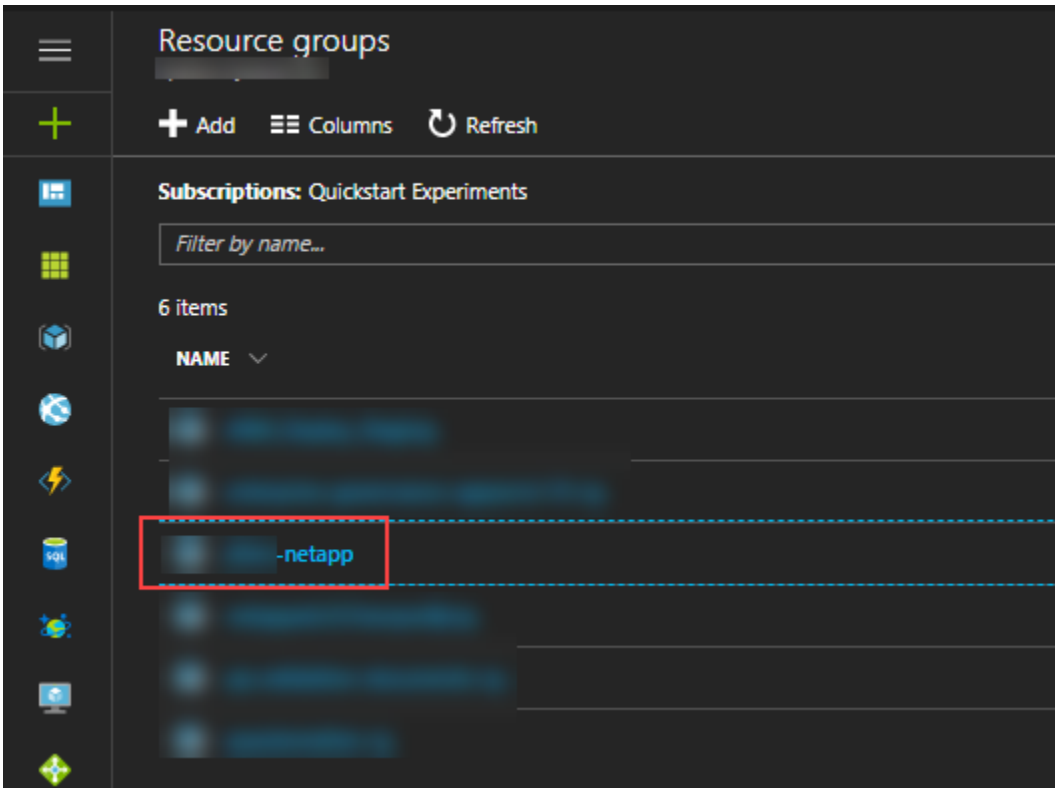
15. From the three-bar icon in the upper-right corner of the screen, choose the option to **Delete** the ONTAP Cloud system.

16. Enter the working environment name in the space provided and click on **Delete.** Deleting would take some time to happen.

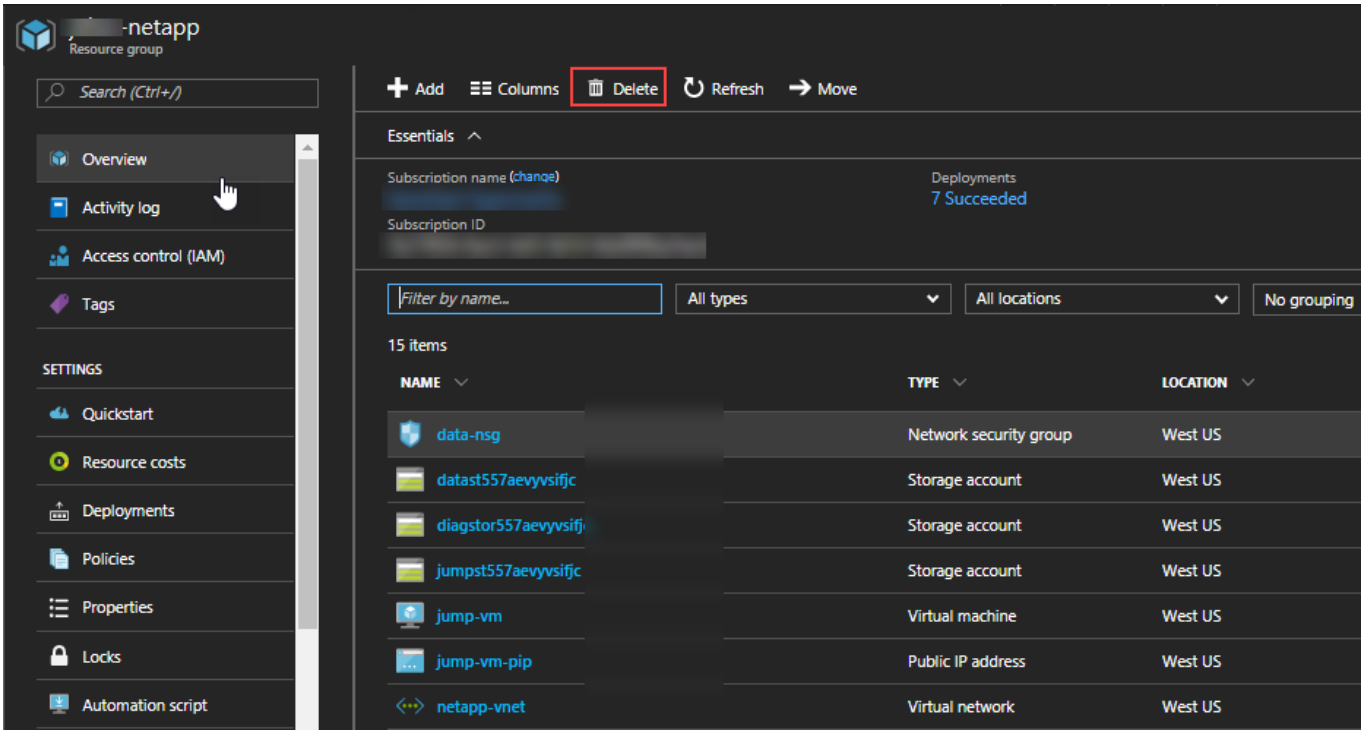


9.2 Deleting the Resource Groups from the Azure Portal

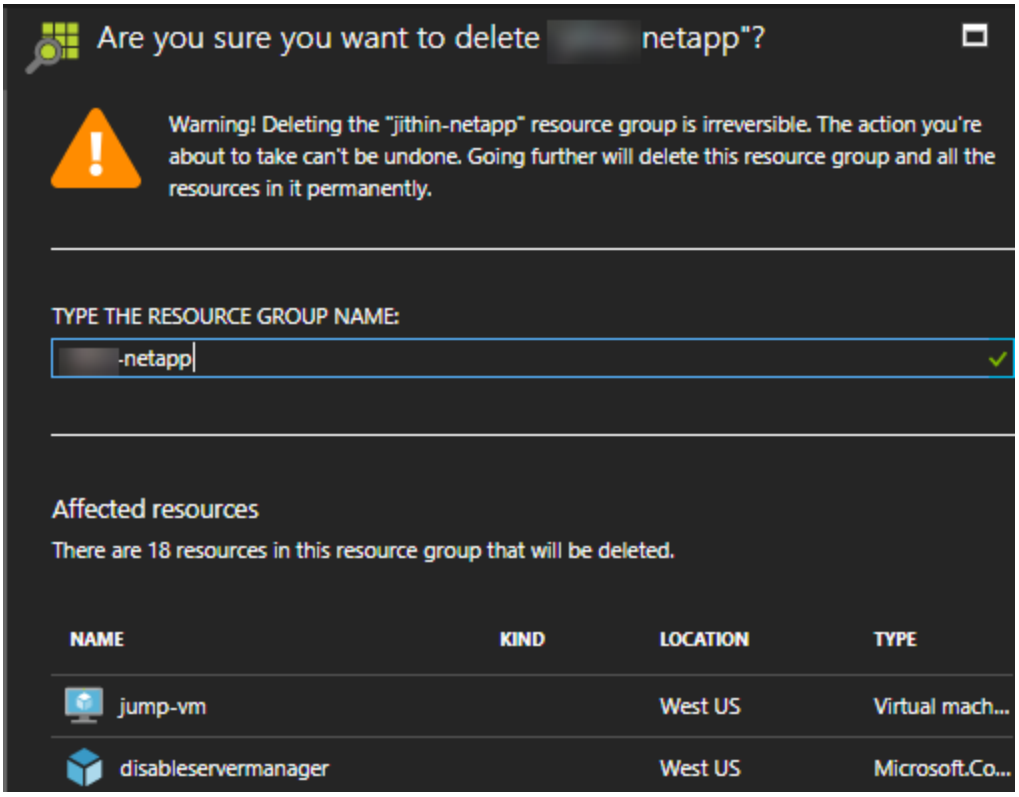
1. In the portal click on **Resource groups**, and click on the resource group that have been deployed by the template.



2. Click on **Delete** button on the top.



3. Type the resource group name in the space provided and click on **Delete.**



10. Security

10.1 Network Security Groups

The template creates **Network Security Groups** in which you can specify set of rules that can protect the deployments. A security group acts as a firewall that controls the traffic for one or more instances.

This template deploys two resource groups: **data-nsg** and **web-nsg.** Following rules are created by the template in the web-nsg.

Direction	Source	Destination	Service	Action
Inbound	*0.0.0.0/0*	10.0.1.0/24	HTTP(TCP/80)	Allow
Inbound	*0.0.0.0/0*	10.0.1.0/24	RDP(TCP/3389)	Allow

In addition to the rules that are being created, by default azure creates certain security rules that will monitor and block traffic. Please click on this link to know more in detail.

10.2 Operating System Security

The root user on ONTAP Cloud and Cloud Manager can be accessed only by using the password specified during the deployment process. Azure doesn't store these passwords.

Operating system patches are your responsibility and should be performed on a periodic basis.

11. Troubleshooting

If you run into any problems deploying this Quick Start, review the following FAQ for troubleshooting tips and guidance.

Q: Why am I not able to access my ontap manager vm from my system?

A: To access ontap manager vm via ssh, enable SSH rule in via allowing access via port 22 in the **web-nsg.**

Q: Where can I access the log files inside the sql-vm, in case the deploy-netapp-otc.sh script fails to complete execution?

A: In case if any script fails to execute for the sql-vm, the logs can be accessed from. First RDP to the jump-vm and from the jump-vm rdp to the sql-vm. Inside the sql-vm navigate to C:\WindowsAzure\Logs

12. Support

For any support related questions, issues or customization requirements, please contact ng-azure-quickstarts@netapp.com