

NetApp ONTAP Cloud with SQL Server on Azure

Quick Start Reference Deployment

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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.

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.

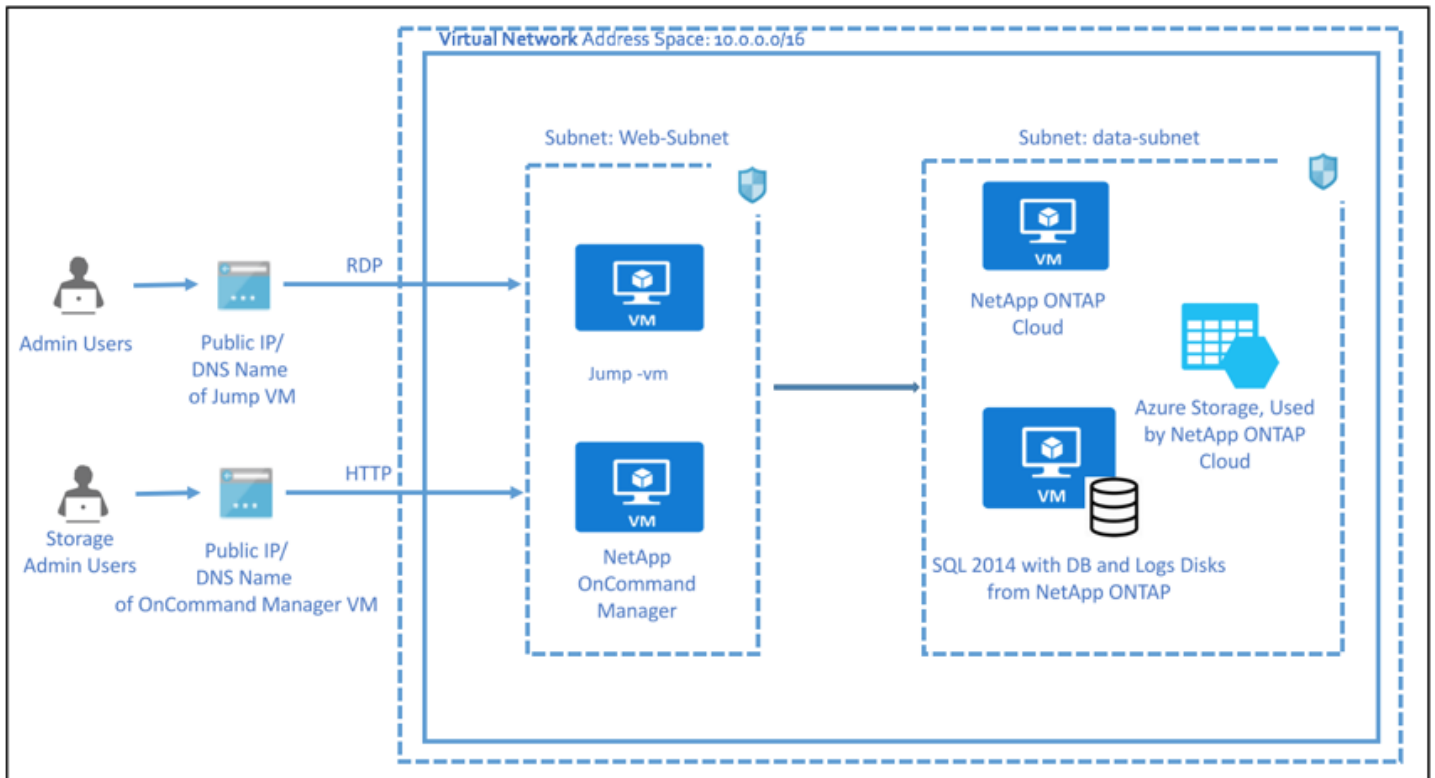
To deploy the Quick start template, enable programmatic deployments in the azure subscription. Instructions are provided in the Deployment Steps section.

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.

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



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).

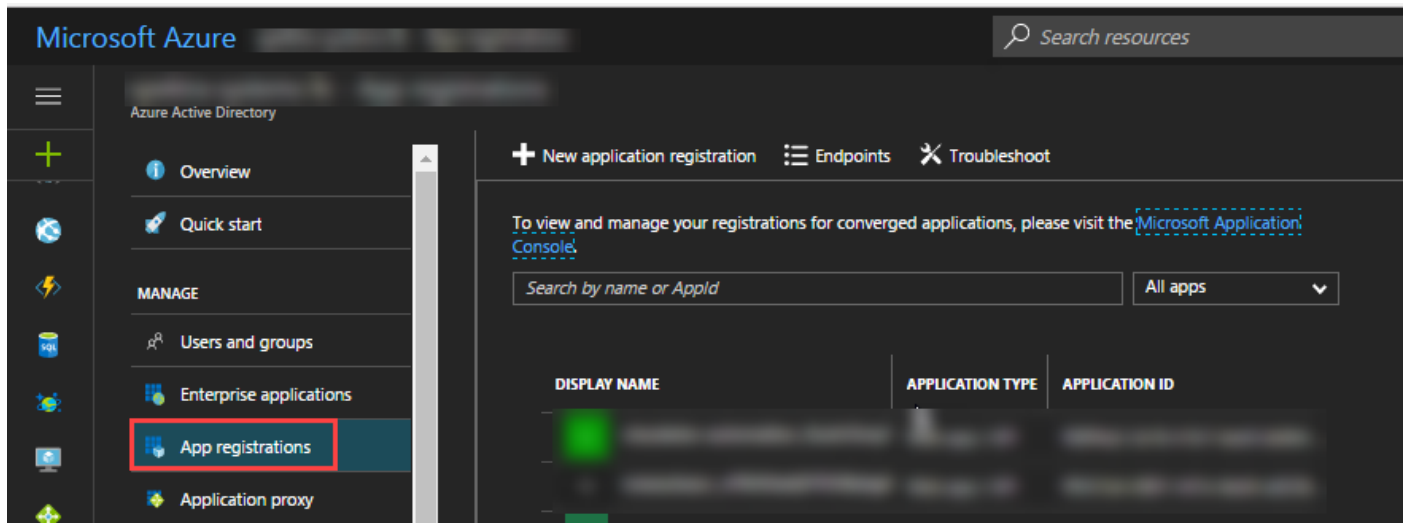
To deploy the Quick start template, programmatic deployments should be enabled in the Azure subscription. Instructions are provided in the Deployment Steps section.

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

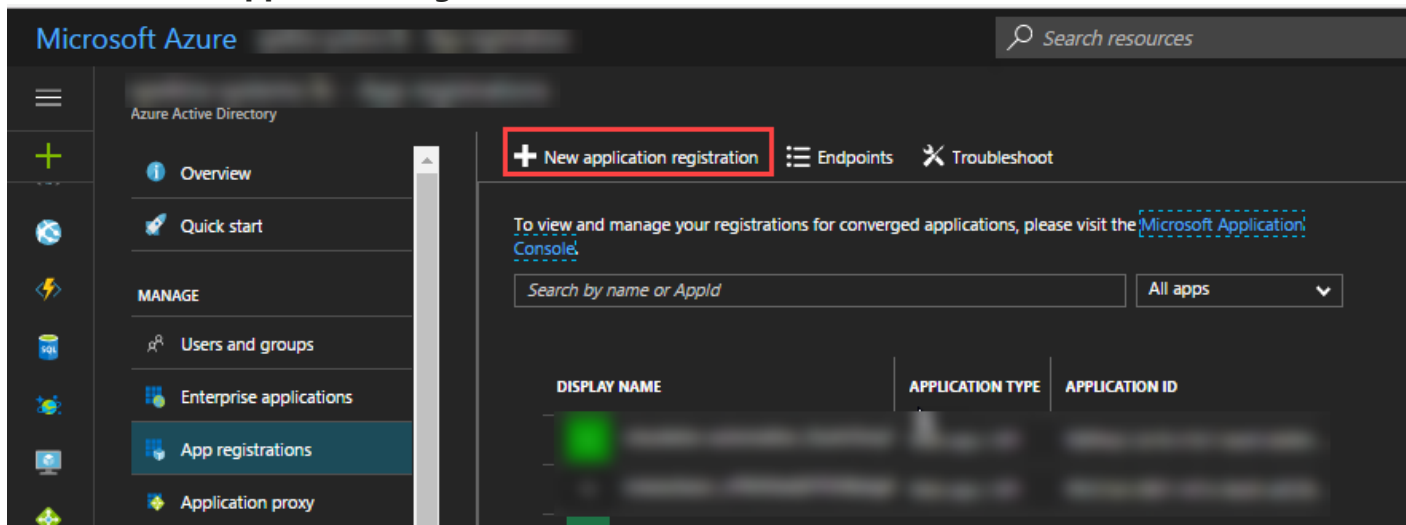
Deployment Steps

Step 1. Creating an Active Directory Application

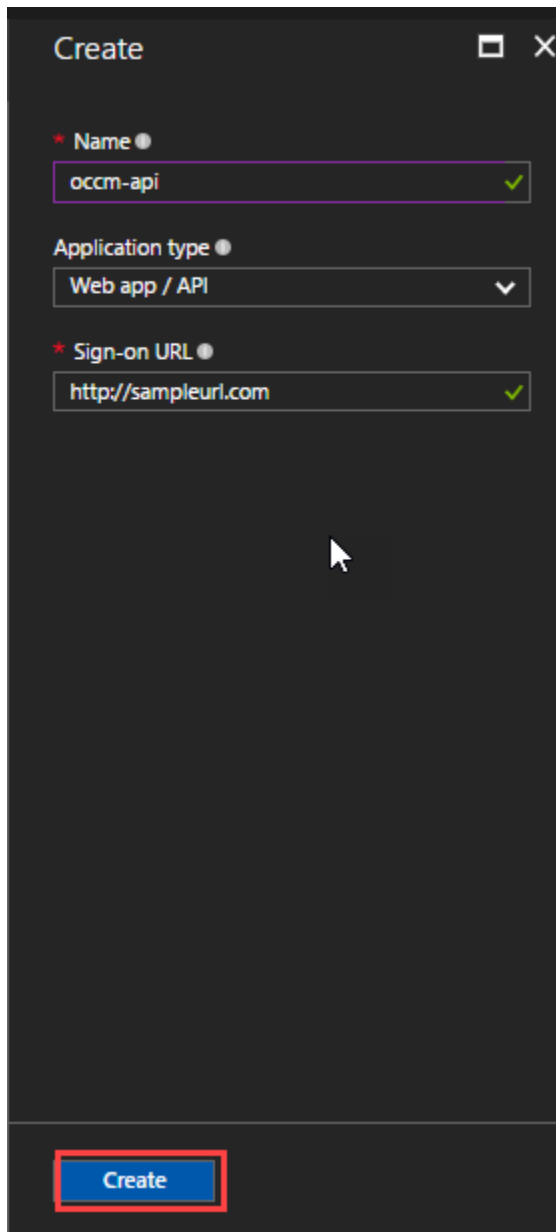
1. In the Azure Portal go to the **Active Directory** and click on **App registrations**.



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**.



Create

* Name ●

occm-api ✓

Application type ●

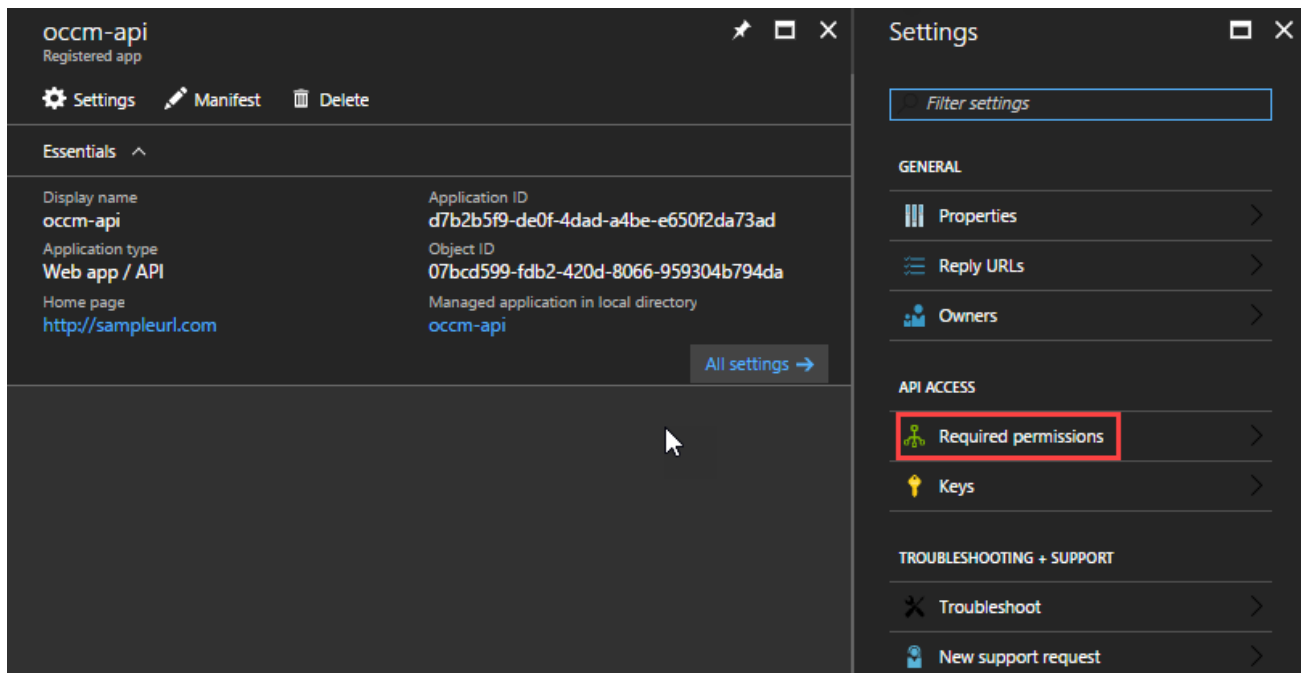
Web app / API ▼

* Sign-on URL ●

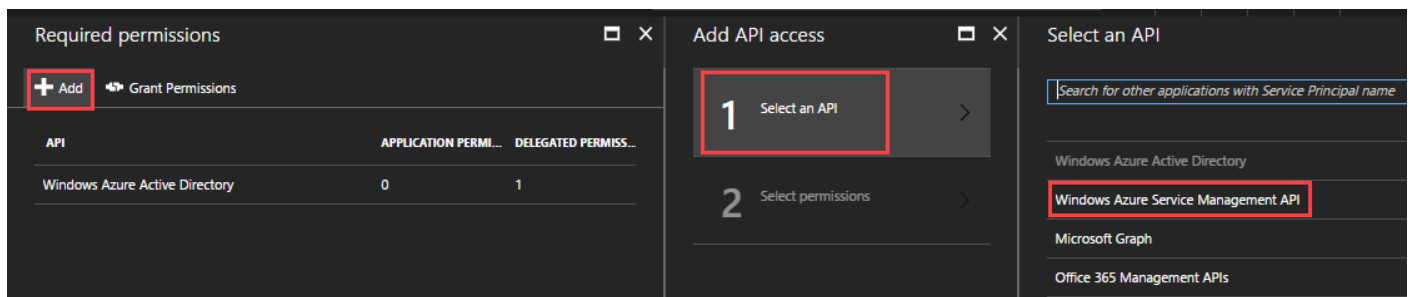
http://sampleurl.com ✓

Create

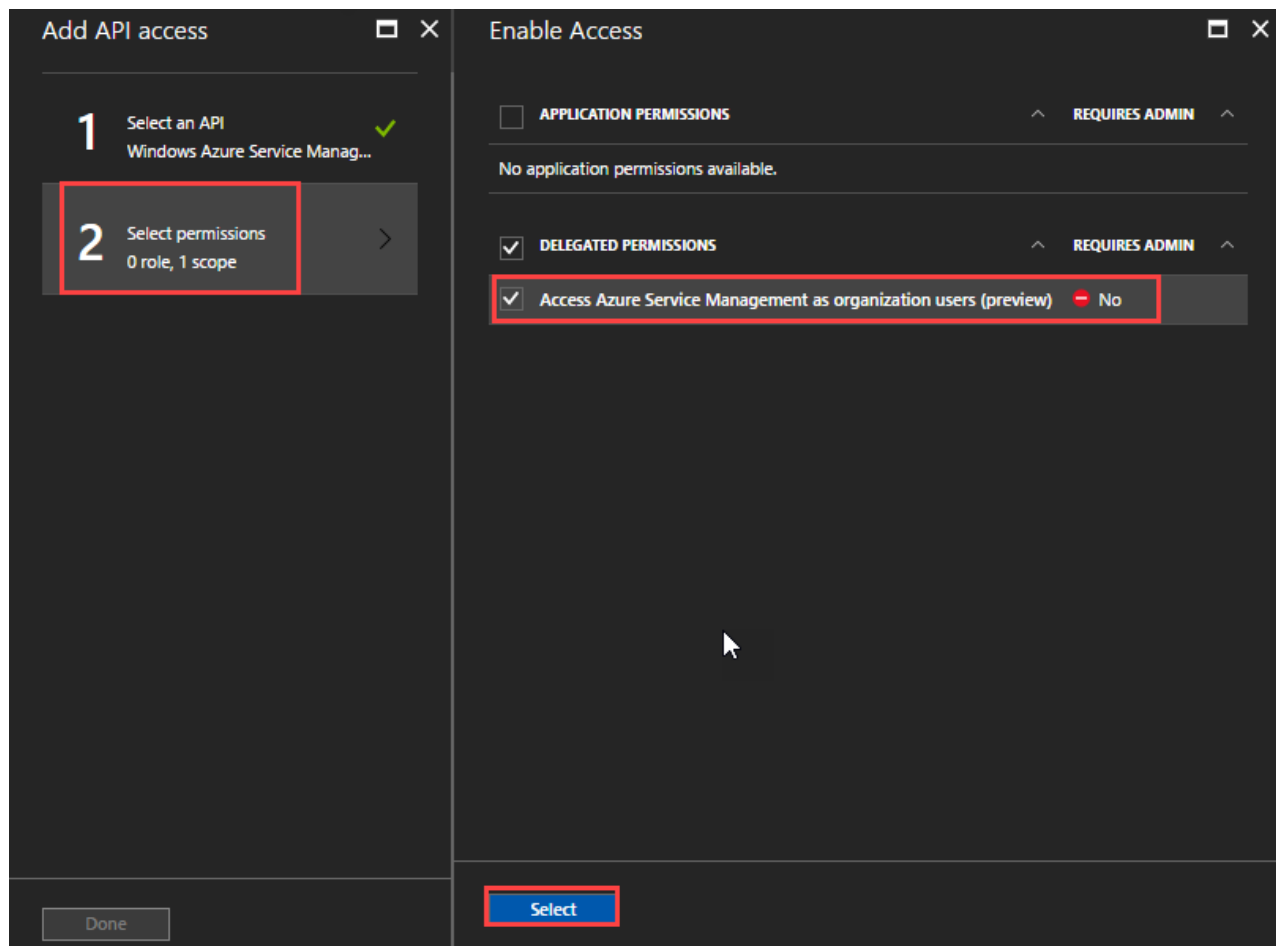
5. The application will get created. Copy and save the **Application ID** as you will need it during the deployment of the template. After the application **occm-api** gets created, click on **occm-api**. Click on **Required permissions**.



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

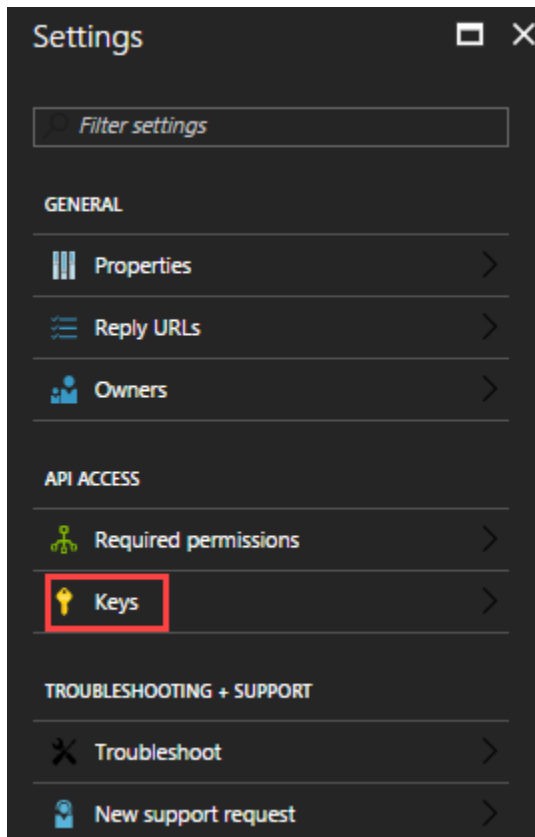


- Click on **Select permissions** and select **Access Azure Service Management as organization users (preview)**. Click on **Select**.

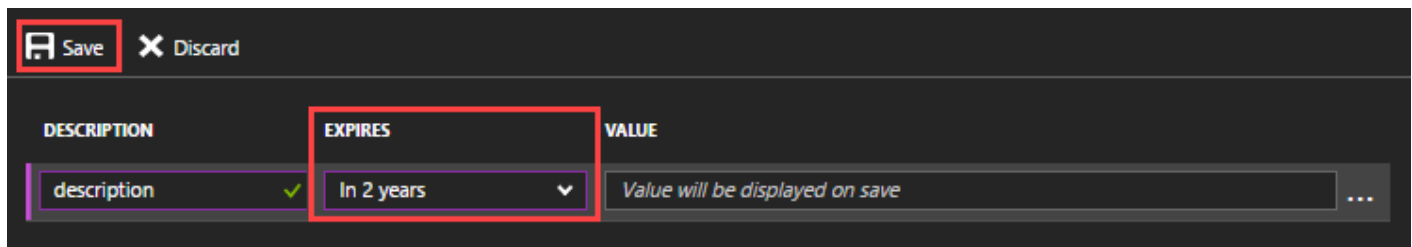


Step 2. Creating an Application Key.

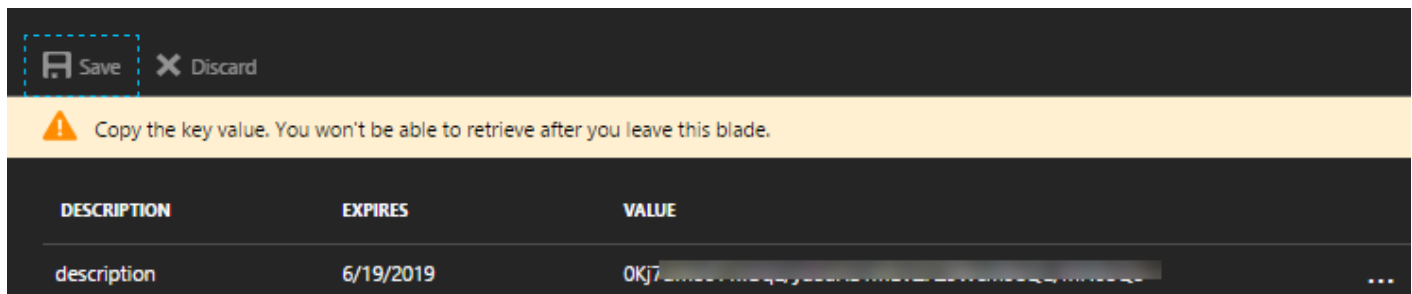
1. Click on **Keys** under the **Settings** page for your application id.



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

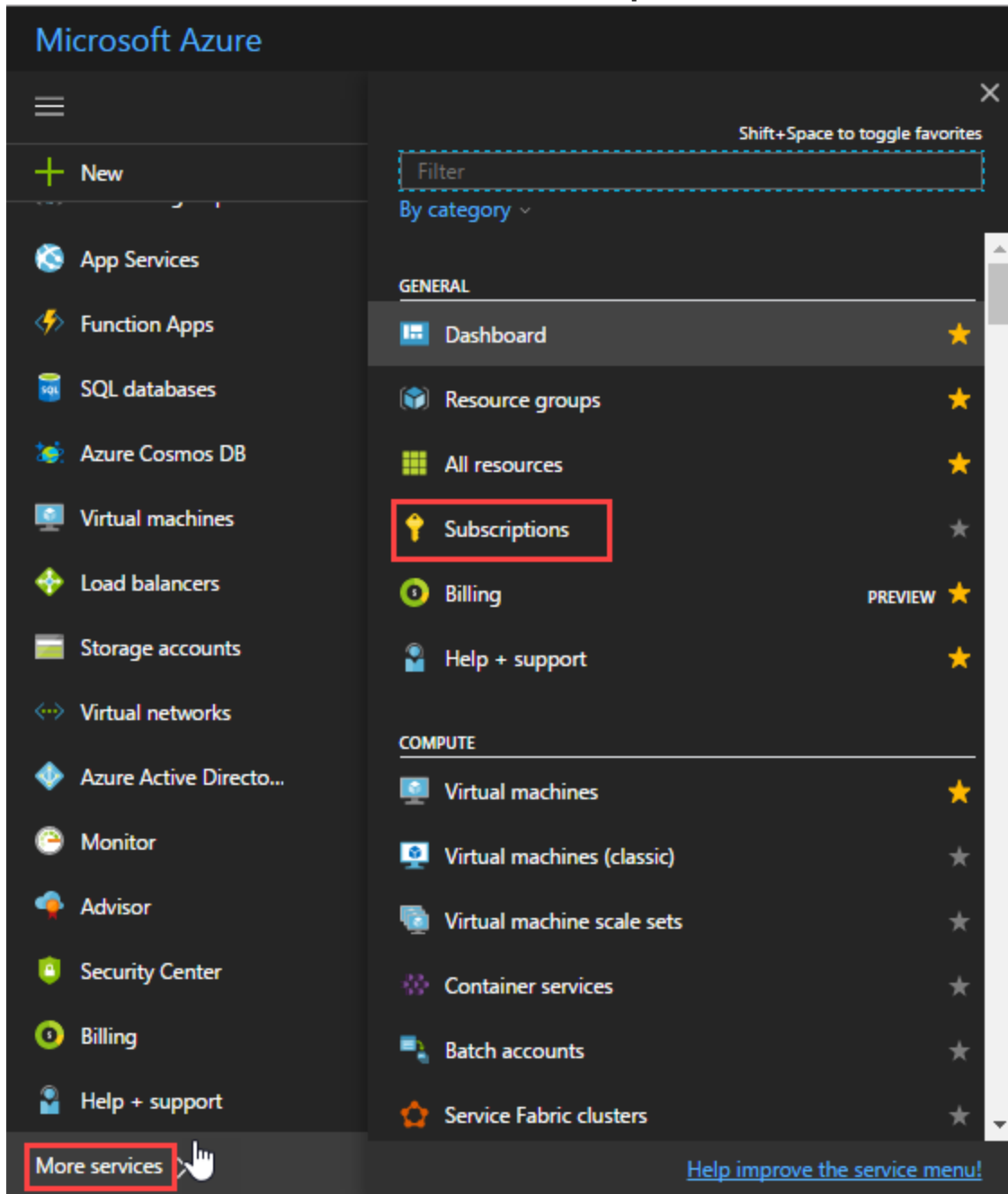


3. Make sure to copy the Value as you won't be able to retrieve after you leave the scope of the key creation. This value is used as application key for your Cloud Manager setup.

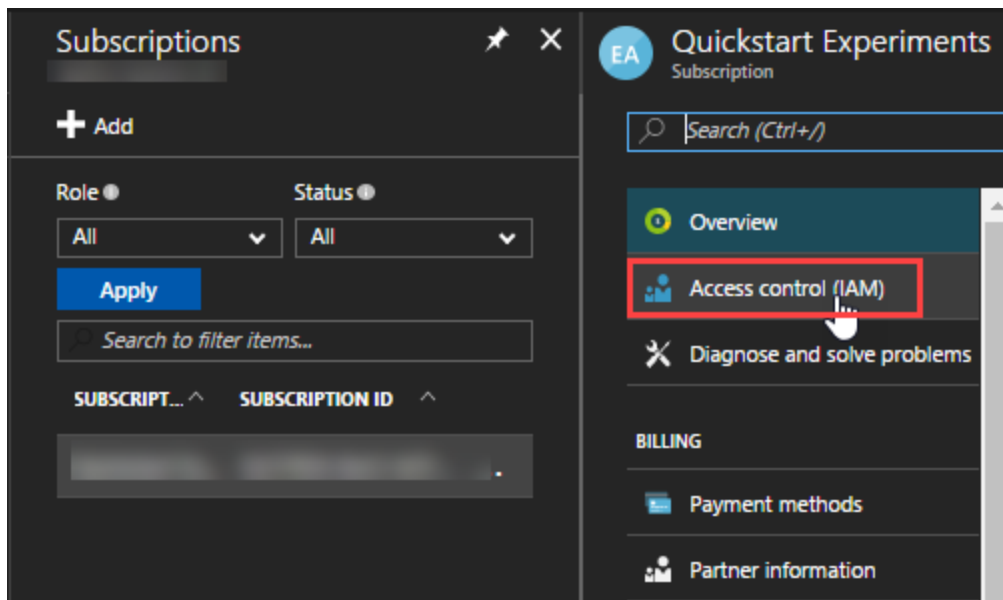


Step 3. Assigning the Cloud Manager role to AD application

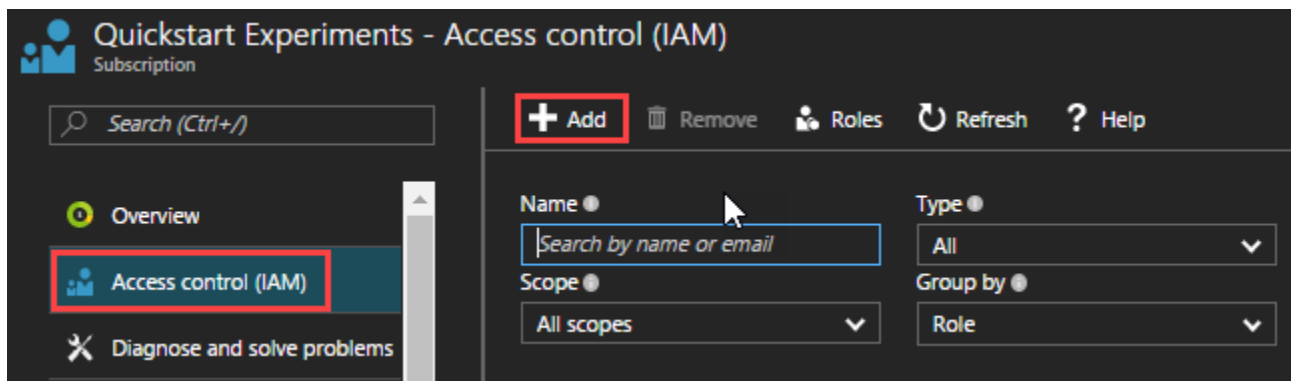
1. Click on **More services** and then click on **Subscriptions**.



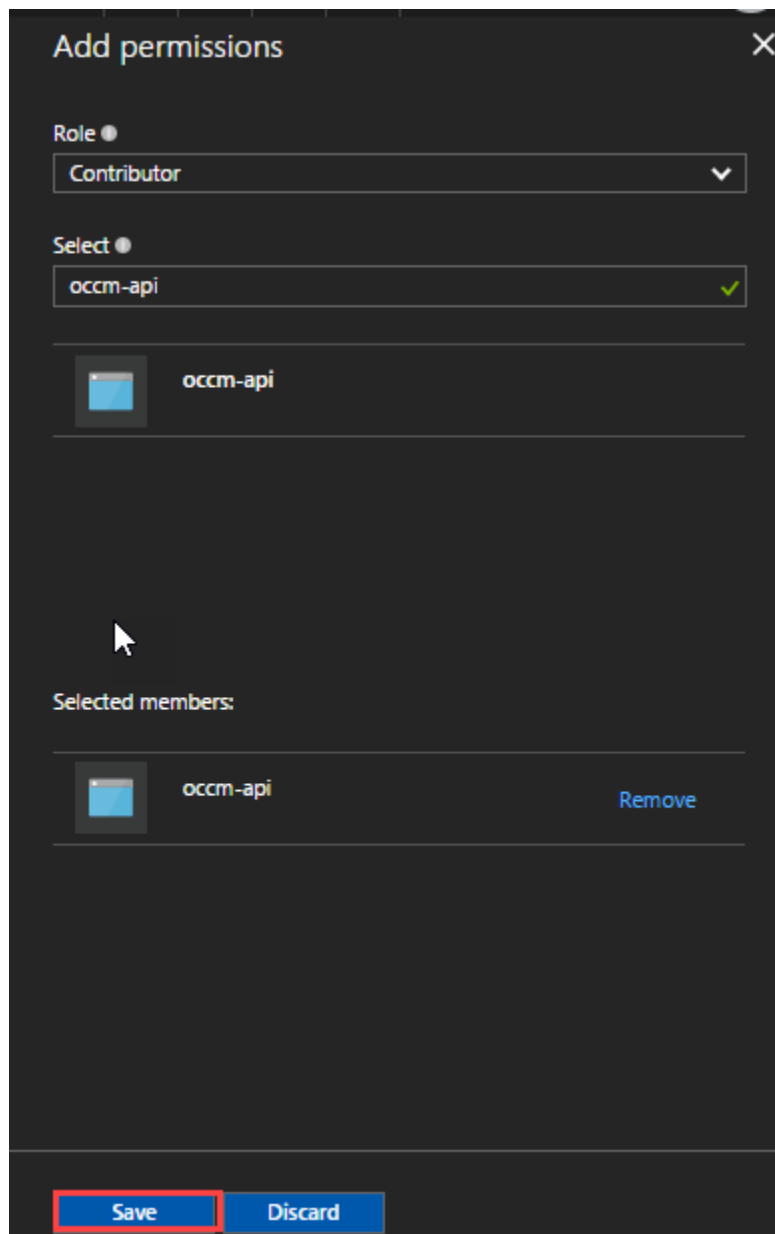
2. Click on your **Subscription** and click **Access Control(IAM)**



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

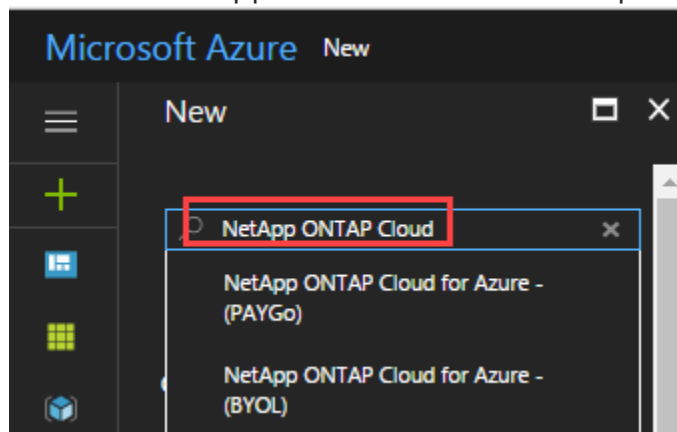


4. After clicking on **Add**, enter the following details:
 Role: **Contributor**
 Select: **occm-api**
5. Click on **Save**.

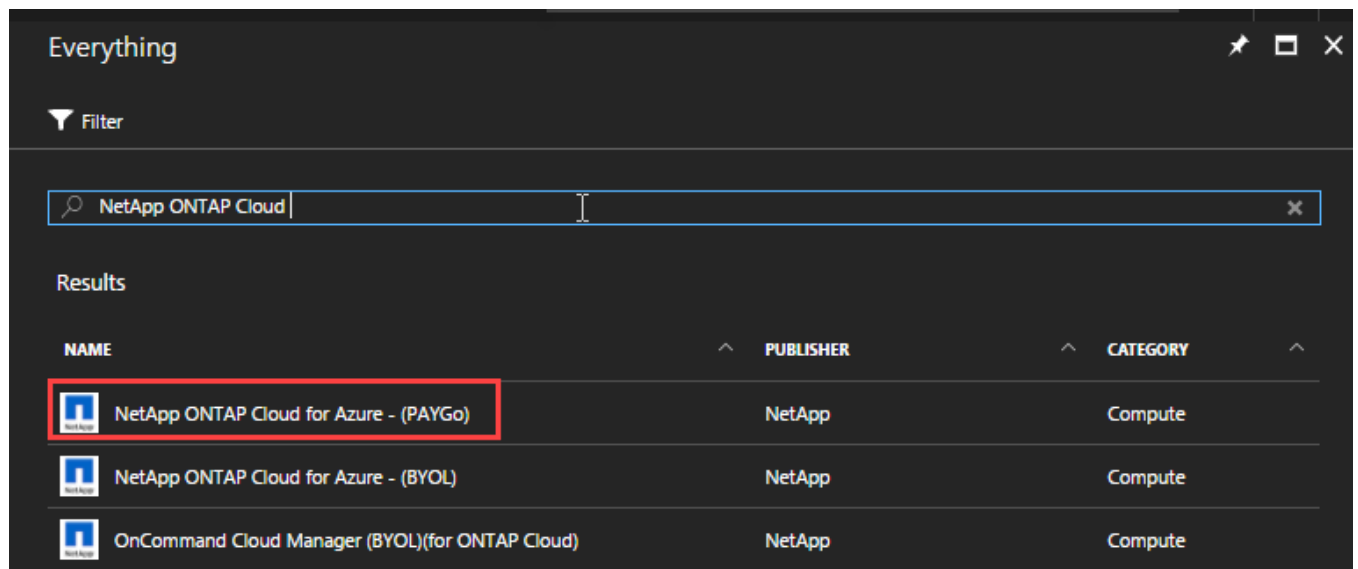


Step 4. Enable Programmatic Deployment


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



NetApp ONTAP Cloud for Azure - (PAYGo)

NetApp

Free Trial enabled.

30 Day Free Trial Available - NetApp ONTAP Cloud, the leading enterprise storage operating system, is deployed using OnCommand Cloud Manager to deliver secure, proven NFS, CIFS and iSCSI data management for Azure cloud storage. A software-only storage service running the ONTAP storage operating system, ONTAP Cloud combines data control with enterprise-class storage features—such as data deduplication and compression—to minimize your Azure storage footprint. Take snapshots of your data without requiring additional storage or impacting your application’s performance. ONTAP Cloud can tie your cloud storage to your data center using the leading NetApp replication protocol, SnapMirror technology. OnCommand Cloud Manager handles deployment and management of ONTAP Cloud, giving you a simple point-and-click environment to manage your storage and ease control of your data.

ONTAP Cloud offers you the power of ONTAP with flexible performance and Azure capacity options: Explore (2TB) and Standard (10TB).

Usage Instructions

Important: You must use OnCommand Cloud Manager to launch ONTAP Cloud environments. You cannot launch ONTAP Cloud directly from the Azure portal, as the ONTAP Cloud system will not be deployed correctly. At a high level, deploying OnCommand Cloud Manager and ONTAP Cloud involves these steps:

1. Prepare your Azure environment
2. Enable programmatic deployment on the ONTAP Cloud products you plan to use from the Azure Marketplace
3. Launch the OnCommand Cloud Manager software instance in Azure
4. Access Cloud Manager by entering the instance IP address in a web browser
5. Complete the Setup wizard
6. Use Cloud Manager to launch ONTAP Cloud instances

Support

Select a deployment model ⓘ

Resource Manager ▼

Create

Want to deploy programmatically? Get started →

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

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)

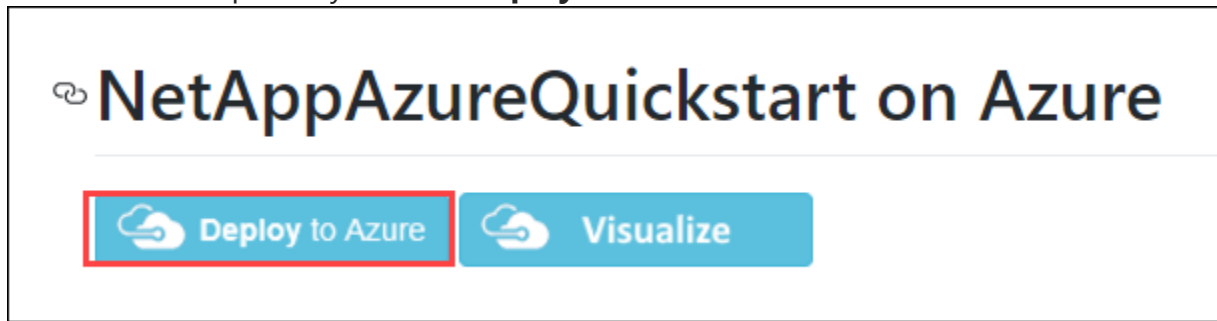
SUBSCRIPTION NAME	SUBSCRIPTION ID	STATUS
Microsoft Azure Enterprise	1577e0e0-4f80-4b8a-9780-7c770070e0d0	<div><div>Enable</div><div>Disable</div></div>

Save

Discard

Step 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:** Choose a strong password. This will be used for all the VMs.
 - 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:** keep default.
 - _artifacts Location Sas Token:** keep default.
 - 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 ⓘ	<div>Subscription</div> <div>▼</div>
* Resource group ⓘ	<div><input checked="" type="radio"/> Create new <input type="radio"/> Use existing</div> <div></div>
* Location ⓘ	<div>West US</div> <div>▼</div>

SETTINGS

* Admin Username ⓘ	<div></div>
* Admin Email Address ⓘ	<div></div>
* Admin Password ⓘ	<div></div>

Netapp Ontap Cloud License Type ● Standard

* Azure AD Application ID ●

* Azure AD Application Secret ●

* Sql Data Volume Size ●

_artifacts Location ● `https://raw.githubusercontent.com/SpektraSystems/NetAppAzureQuickstart/master`

_artifacts Location Sas Token ●

Remote Allowed CIDR ● 0.0.0.0/0

TERMS AND CONDITIONS

[Azure Marketplace Terms](#) | [Azure Marketplace](#)

By clicking "Purchase," I (a) agree to the applicable legal terms associated with the offering; (b) authorize Microsoft to charge or bill my current payment method for the fees associated 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, if the deployment involves 3rd party offerings, Microsoft may share my contact information and other details of such deployment with the publisher of that offering.

☐ I agree to the terms and conditions stated above

☐ Pin to dashboard

Purchase

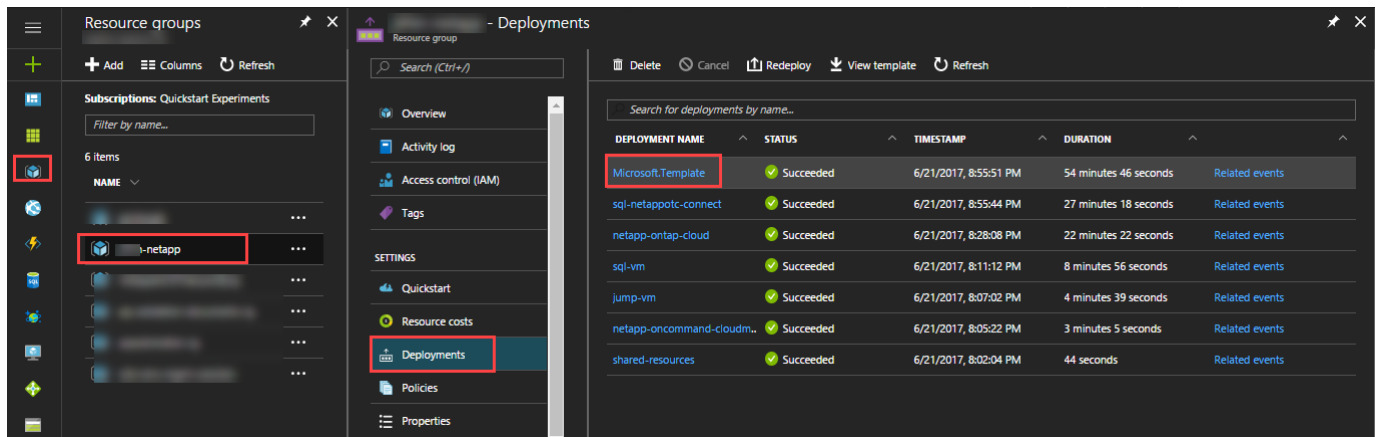
Deployment Time

The deployment takes about 1 hour.

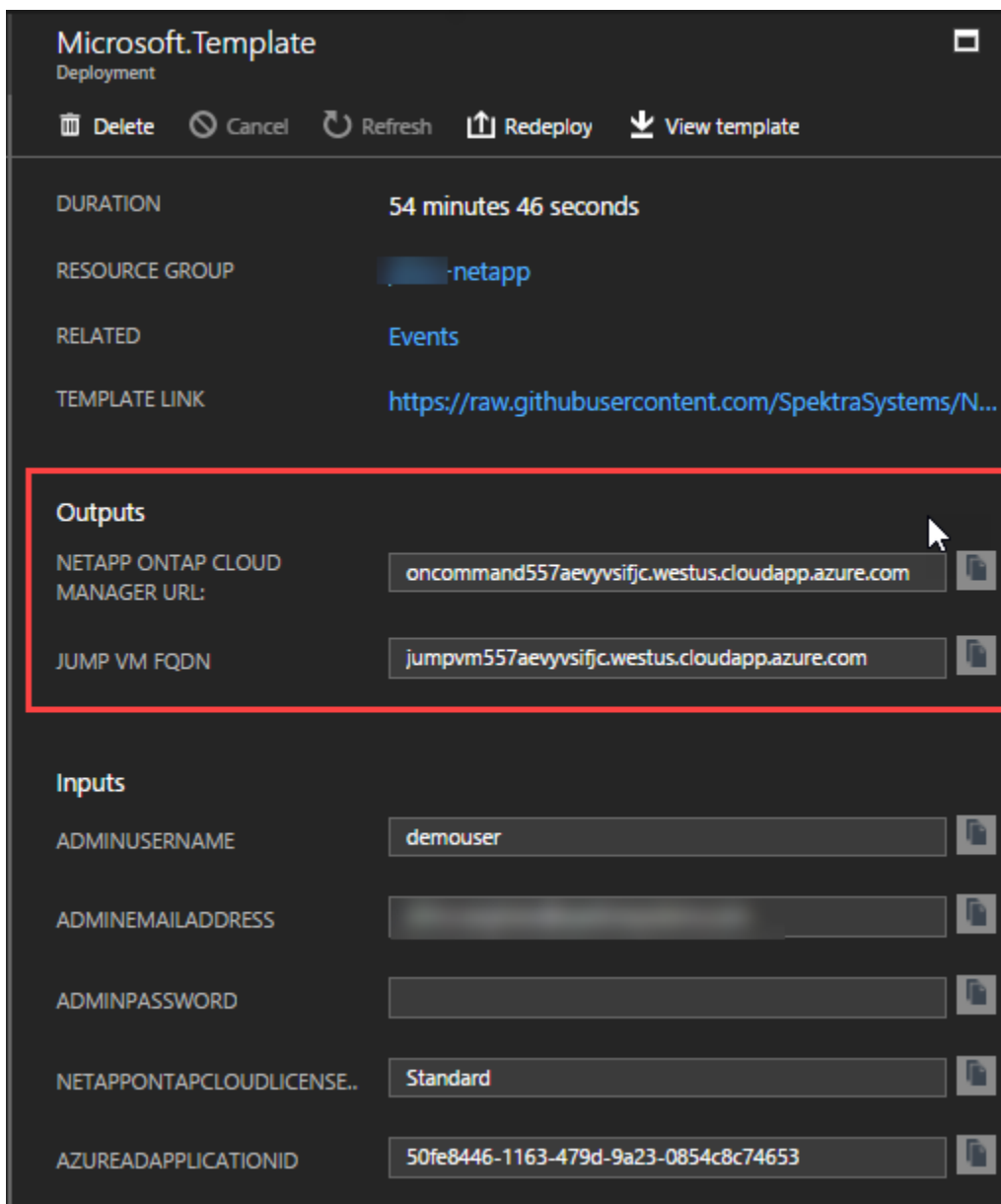
Post Deployment

Look at the Template output values

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**

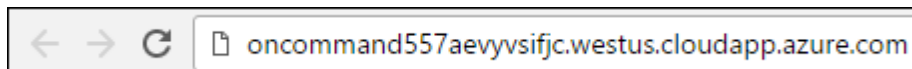
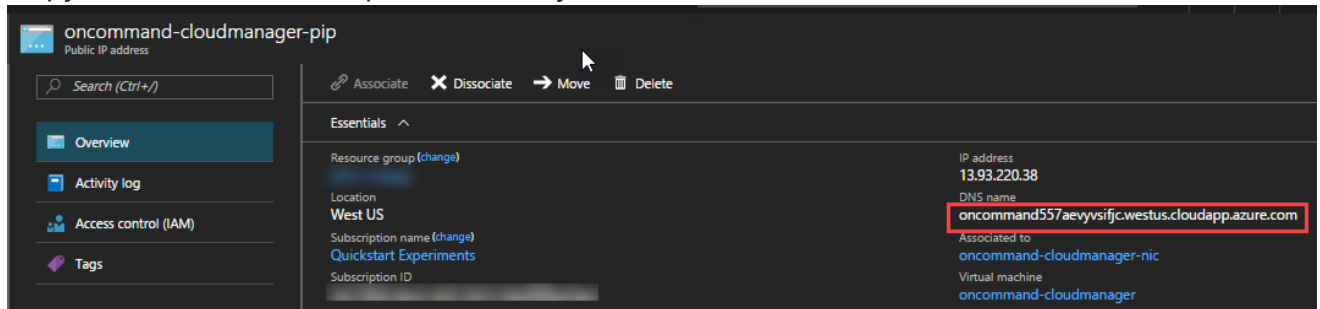


3. On clicking **Microsoft.Template**, the template outputs will be displayed.

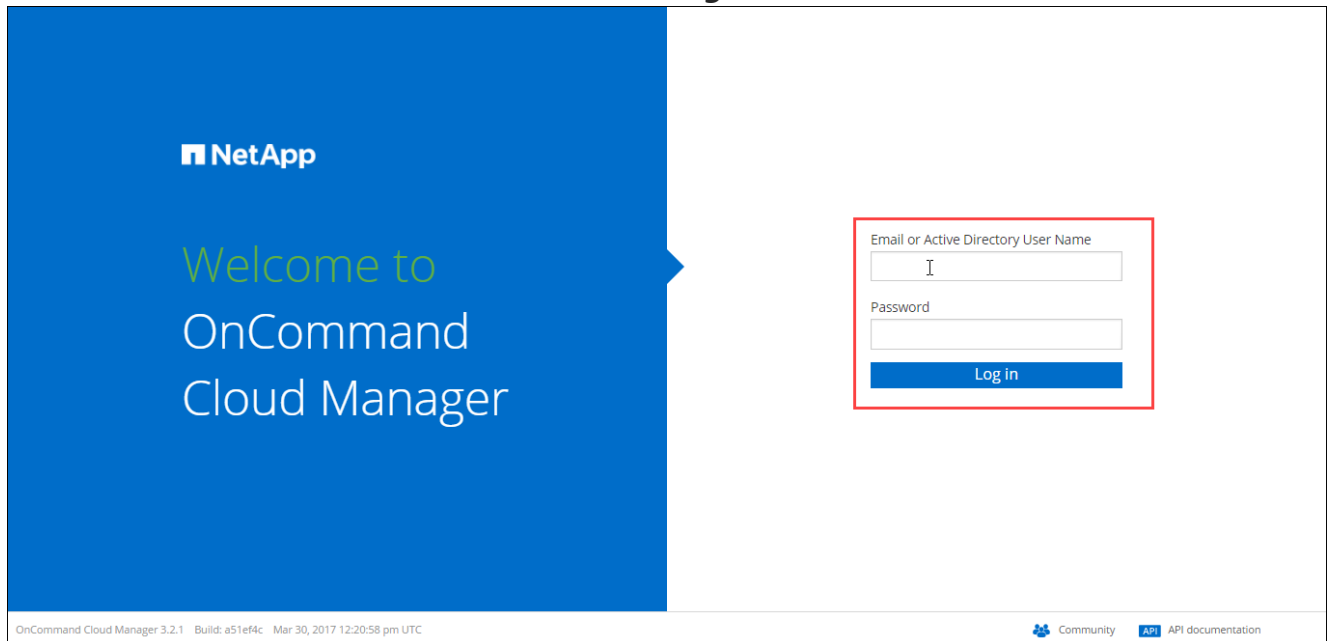


How to Access OnCommand Manager using GUI

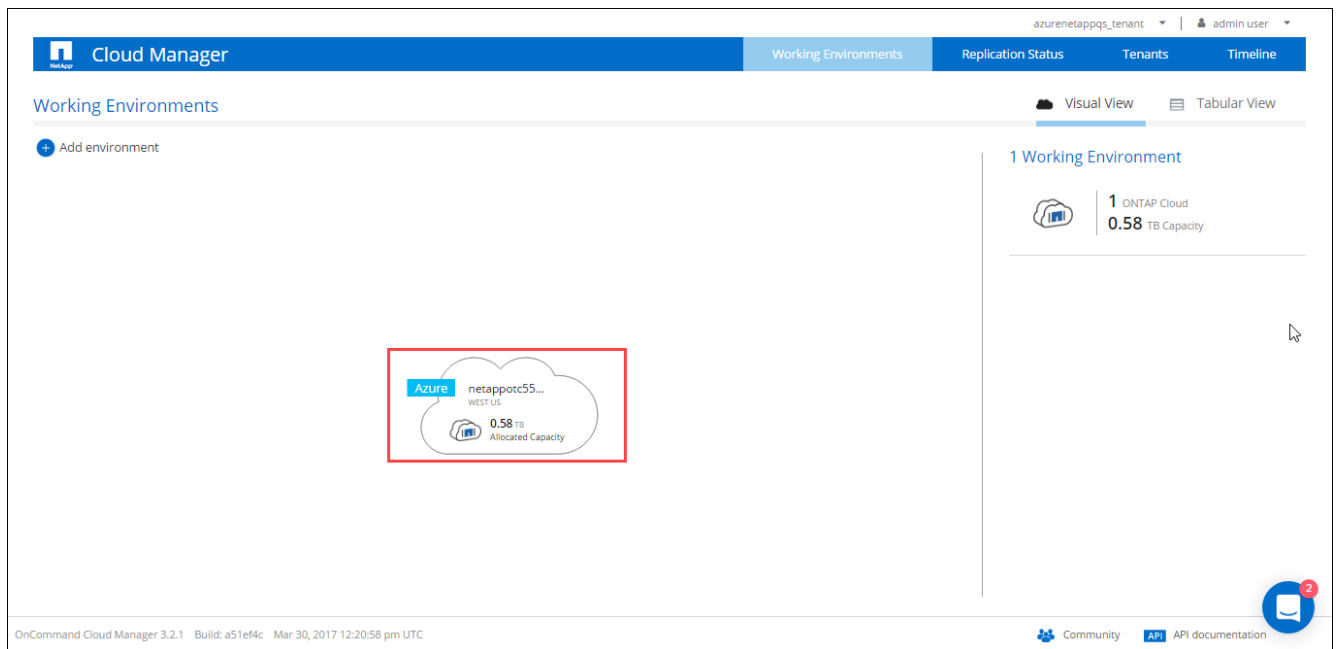
1. Go to the resource group in which the template is deployed.
2. In the resource group click on **oncommand-cloudmanager-pip**.
3. Copy the DNS name and paste it on any browser.



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

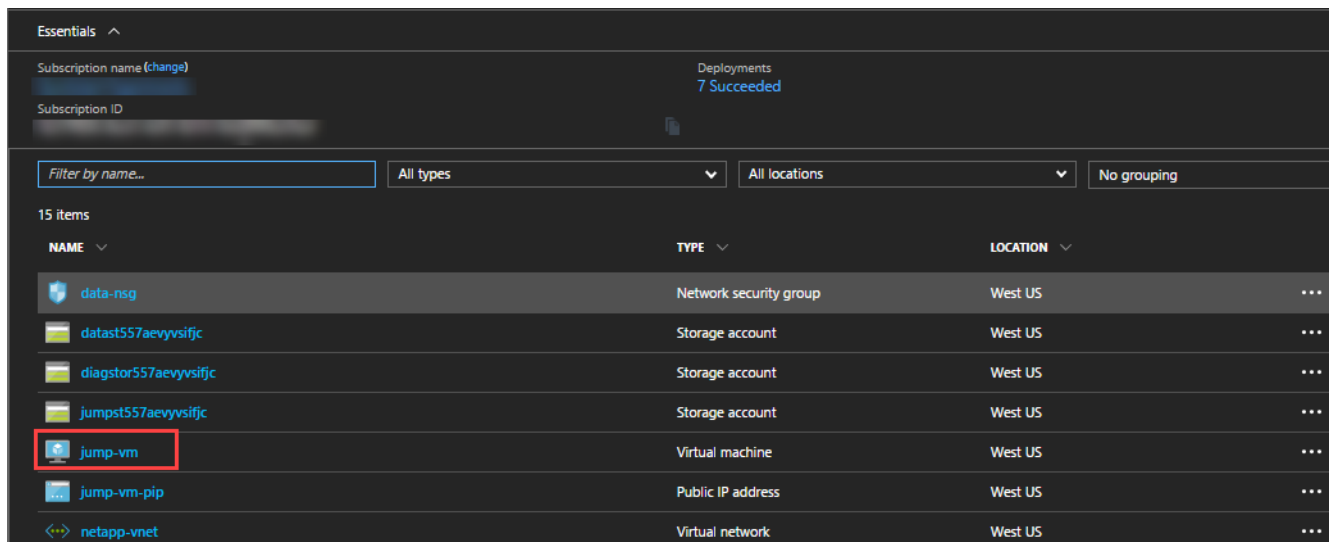


5. After logging, you will be directed to a page where the working environments are displayed. The working environment created by the Quick Start Template is displayed.

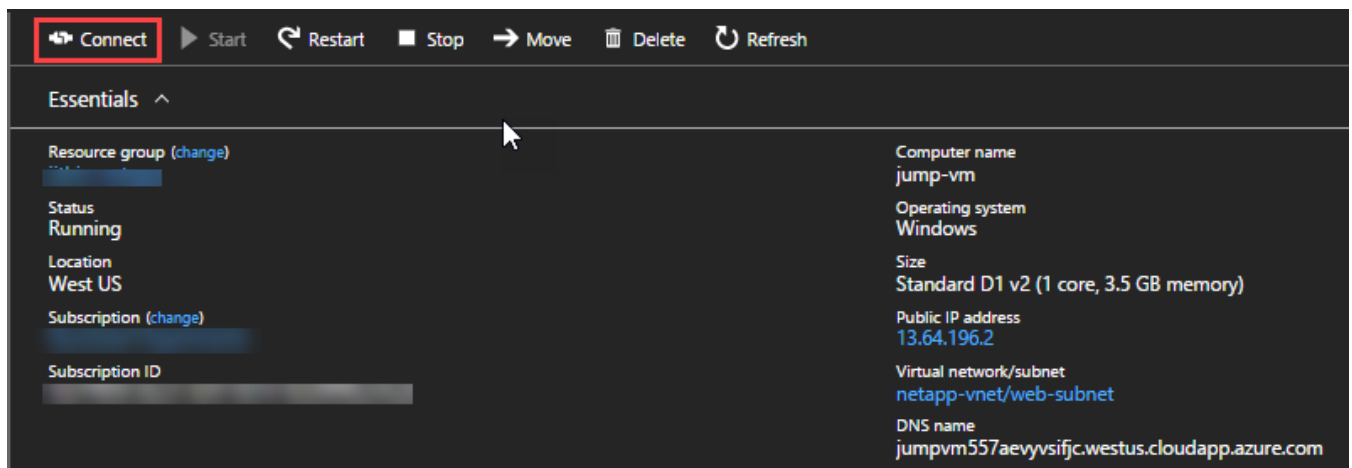


Access SQL VM and Verify NetApp Volumes

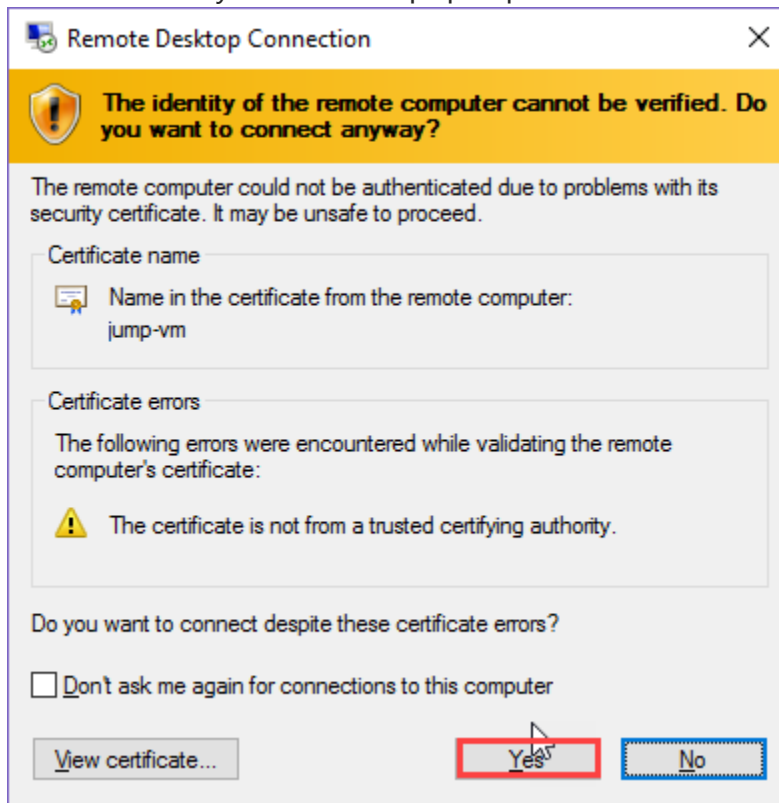
1. Go to the resource group that was created by the template. Click on the **jump-vm**.



2. Click on the **Connect** button on the top. This will download the rdp file for connecting to jump-vm.
3. 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**.

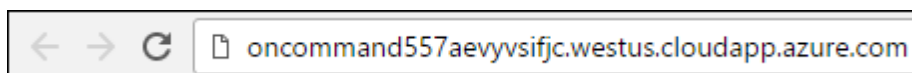
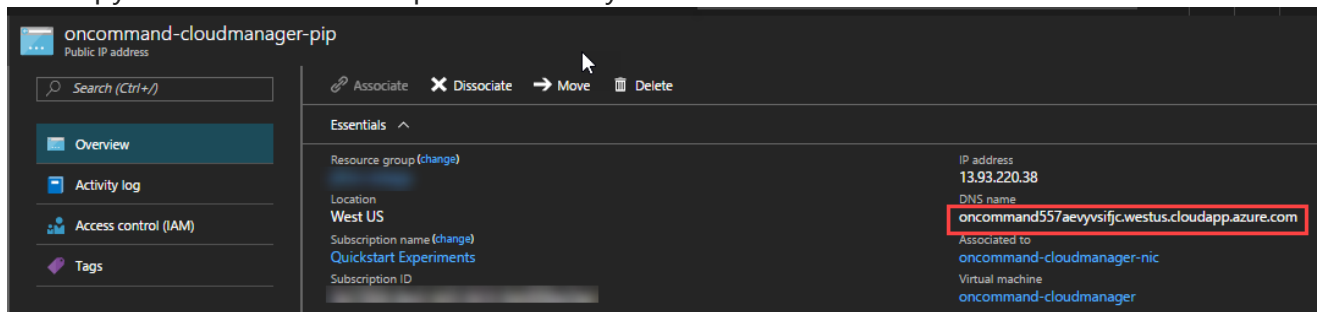


4. Now you are logged into the jump-vm. Inside the jump-vm search for **Remote Desktop Connection**.
5. In the rdp connection window, enter private ip address of the **sql-vm**. To get the private ip address of the sql-vm go to **Resource group (created via template)>sql-vm>properties**.
6. In the Remote Desktop Connection window, the username and password as provided during the time of deployment.
7. Once you are in the sql-vm go to **This PC**. Here you can see the two new netapp volumes mounted.

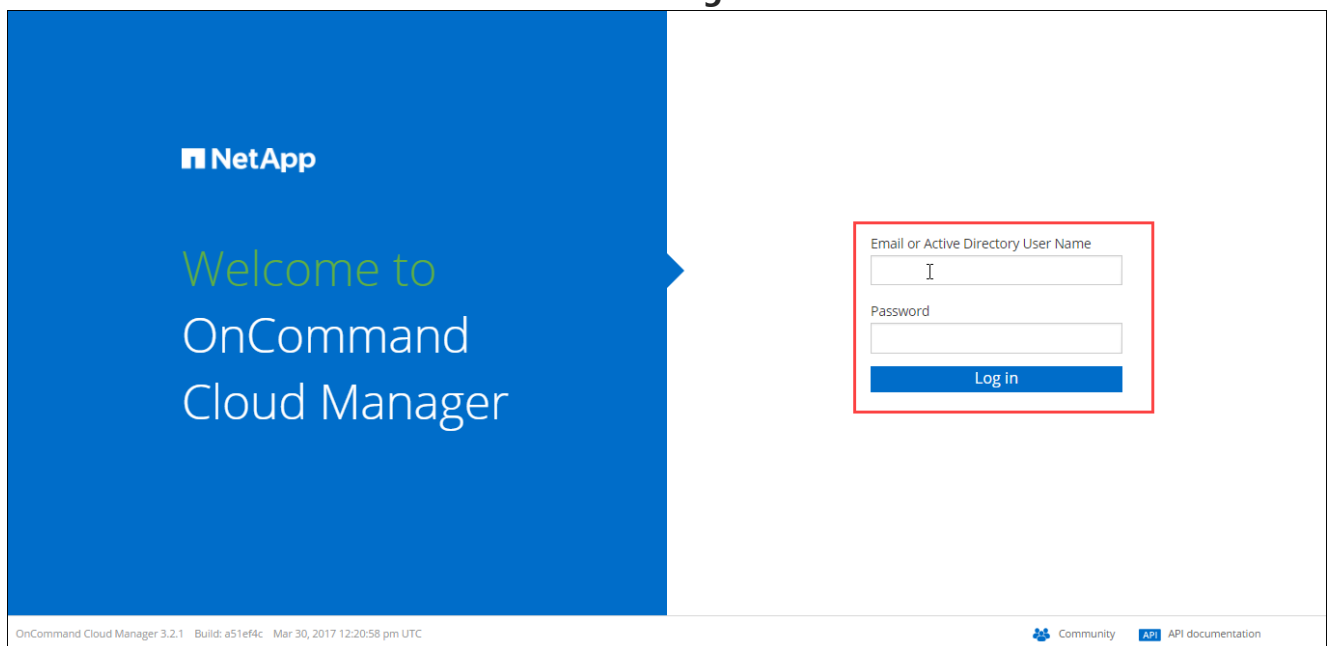
Creating Additional Volumes

Creating Additional Volumes

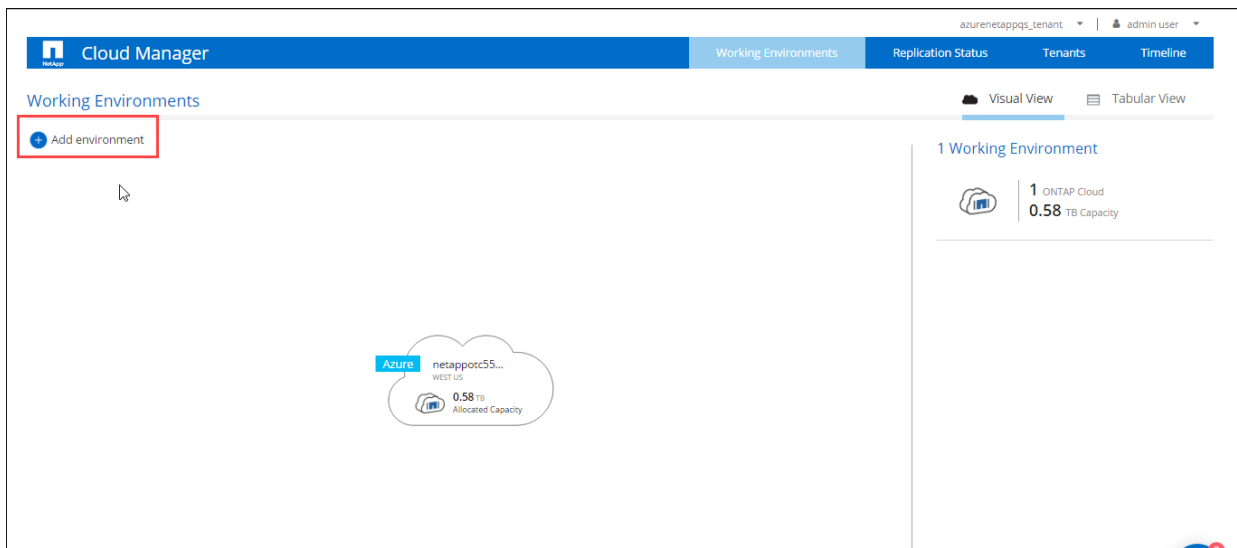
1. Go to the resource group in which the template is deployed.
2. In the resource group click on **oncommand-cloudmanager-pip**.
3. Copy the DNS name and paste it on any browser.



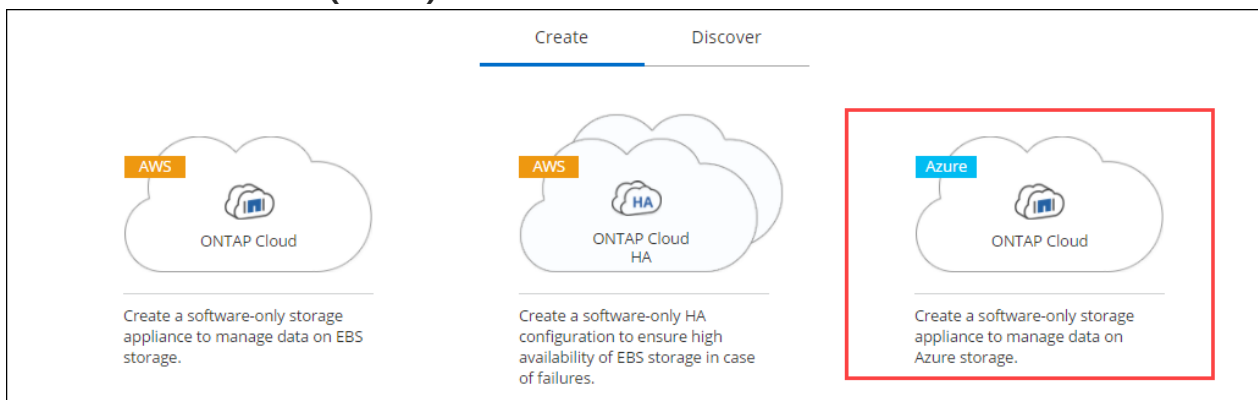
4. Enter the **Email ID** and **Password** and click on **Log In**.



5. Now that you are logged into the OnCommand Manager, click on **Add environment**.



6. Choose **ONTAP Cloud(Azure)**.



7. Enter the required details such as **Work Environment Name** and **Password**. After entering the details click on **Continue**.

8. Select the **region** in which the Resource group (created by the template) is deployed. Choose the **Vnet** to which you want to add the ONTAP environment. Choose the **data-subnet** and **data-nsg**. Check the the box and click on **Continue**.

Azure Virtual Network (VNet)

Select an Azure region, VNet and Subnet for your working environment

Azure Region: West US


VNet: netapp-vnet | -ne...

netapp-vnet
netapp | 10.0.0.0/16

Subnet: 10.0.2.0/24

Security group: data-nsg


☒ I have verified network connectivity between the Cloud Manager server and the selected VNet.


Continue


9. In the **Data Security** window, choose the encryption method you wish to choose. For the time being we choose **None**.

Data Security

Please note: You cannot change the encryption method after you create the ONTAP Cloud system.

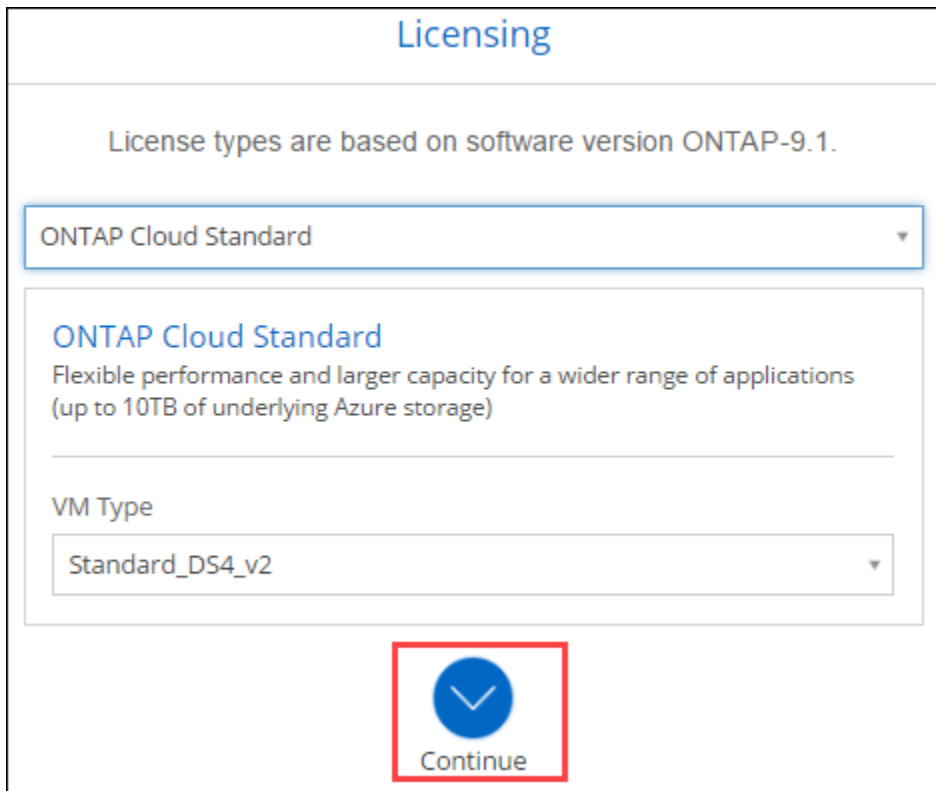
 None

The data on this ONTAP Cloud system will not be encrypted.

 Azure Managed

Azure is responsible for data encryption and decryption operations. Key management is handled by Azure key management services.

10. Choose the **License** that you wish to use. For demo purposes **ONTAP Cloud Standard** is chosen. Select the **VM Type**. For demo purposes **Standard_DS4_v2** is chosen. Click on **Continue**.



11. Provide the **NSS User ID** and **NSS Password**(Both are optional). Click on **Continue**.

here.' Below this text is a 'More Info' link with a downward arrow. There are two input fields: 'NSS User ID (Optional)' and 'NSS Password (Optional)'. Both fields are empty. At the bottom, there is a blue circular button with a white checkmark and the word 'Continue' below it, which is highlighted with a red rectangular box." data-bbox="144 545 962 843"/>

12. Choose the Tiering **Standard/Premium** and provide the **Azure Disk Size**. Click on **Continue**.

13. Choose the writing speed **Normal/High** and click on **Continue**.

14. 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**.

Previous Step ^

Create Volume

Details & Protocol

Volume Name: volume Size (GB): 500

Protocol: NFS

Access control:
☐ No access to the volume
☒ Custom export policy
10.0.0.0/16

Volume Protection

Snapshot Policy: default

- Every hour, keep the last 6 copies
- Once a day, keep the last 2 copies
- Once a week, keep the last 2 copies

Usage Profile

☒ **Storage Efficiencies**
Leverages Thin Provisioning and Deduplication

☐ **Thick provisioning**
Fully provisioned capacity for lower latencies

Underlying Azure Tier

Standard Storage (HDD)
This volume tiering is identical to the working environment tiering option you choose. In future volumes you will be able to select different tiering options.

Continue Skip

15. Review and Approve all the values you have entered. Check mark the two conditions and click on **GO**.

Create a New Working Environment

Previous Step ^

Review & Approve

Azure demoenv West US 500 GB

Storage System:	ONTAP Cloud	Capacity Limit:	10TB
Software Version:	ONTAP-9.1	Encryption:	None
ONTAP Cloud runs on:	Standard_DS4_v2	Write Speed:	Normal
Underlying Azure Disks:	Standard Storage (HDD), 1 TB	Volume Name:	volume
Azure VNet:	netapp-vnet netapp (10.0.0.0/16)	Volume Size:	500 GB
CIDR:	10.0.2.0/24	Protocol:	NFS
Security Group:	data-nsg	Usage Profile:	Storage Efficiencies
License Type:	ONTAP Cloud Standard	Snapshot Policy:	default

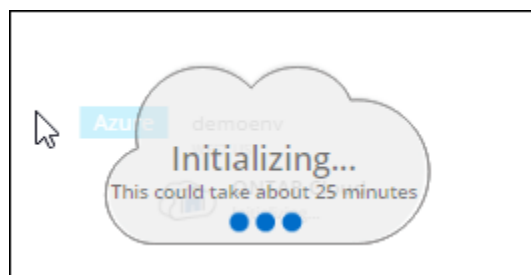
☒ I understand that in order to activate support, I must first register ONTAP Cloud with NetApp. [More information >](#)

☒ I understand that Cloud Manager will allocate the appropriate Azure resources to comply with my above requirements. [More information >](#)

[Show API request](#)

GO

16. Now the environment creation will start and it will take about 25 mins to get completed.

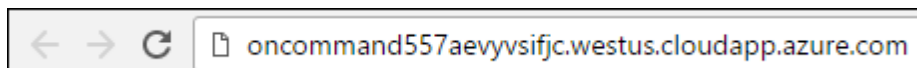
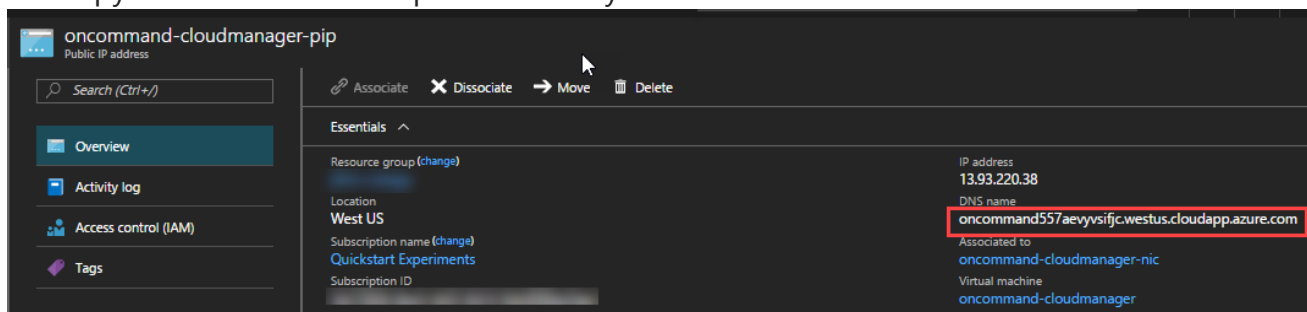


Cleaning Up

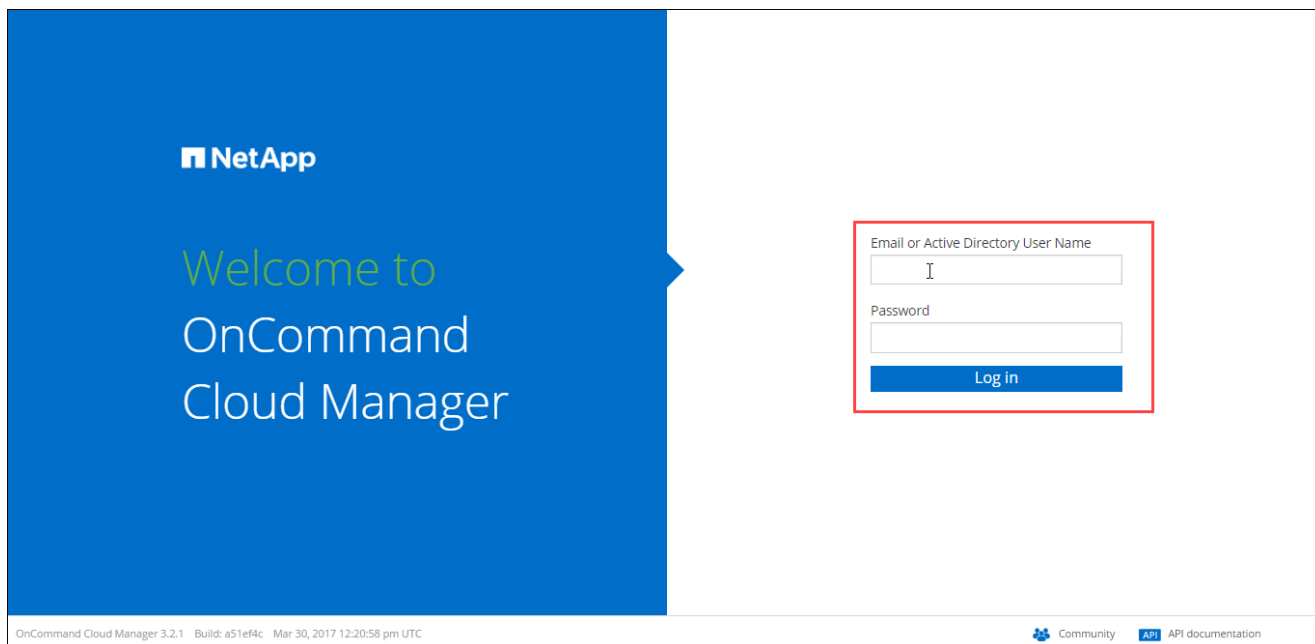
When you complete your work with ONTAP Cloud on Azure, you can clean up your account. Please follow the steps to clean up.

Removing the ONTAP Cloud System using GUI

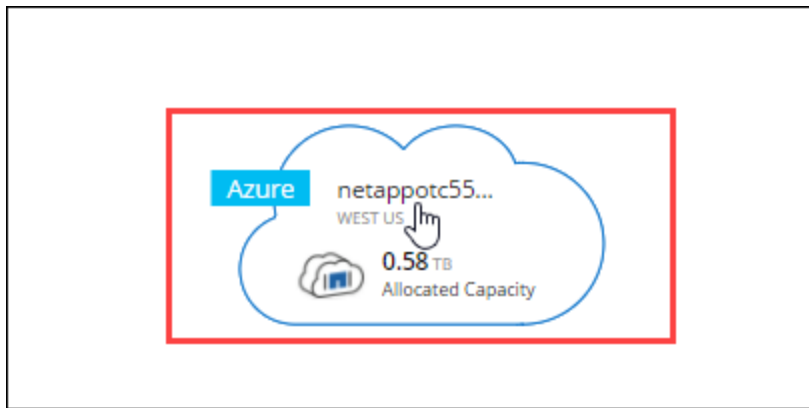
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19. Copy the DNS name and paste it on any browser.



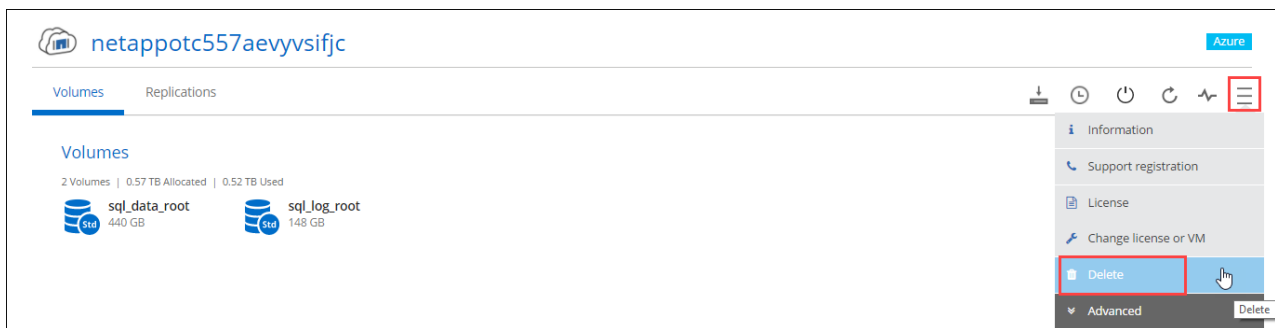
20. Enter the **Email ID** and **Password** and click on **Log In**.



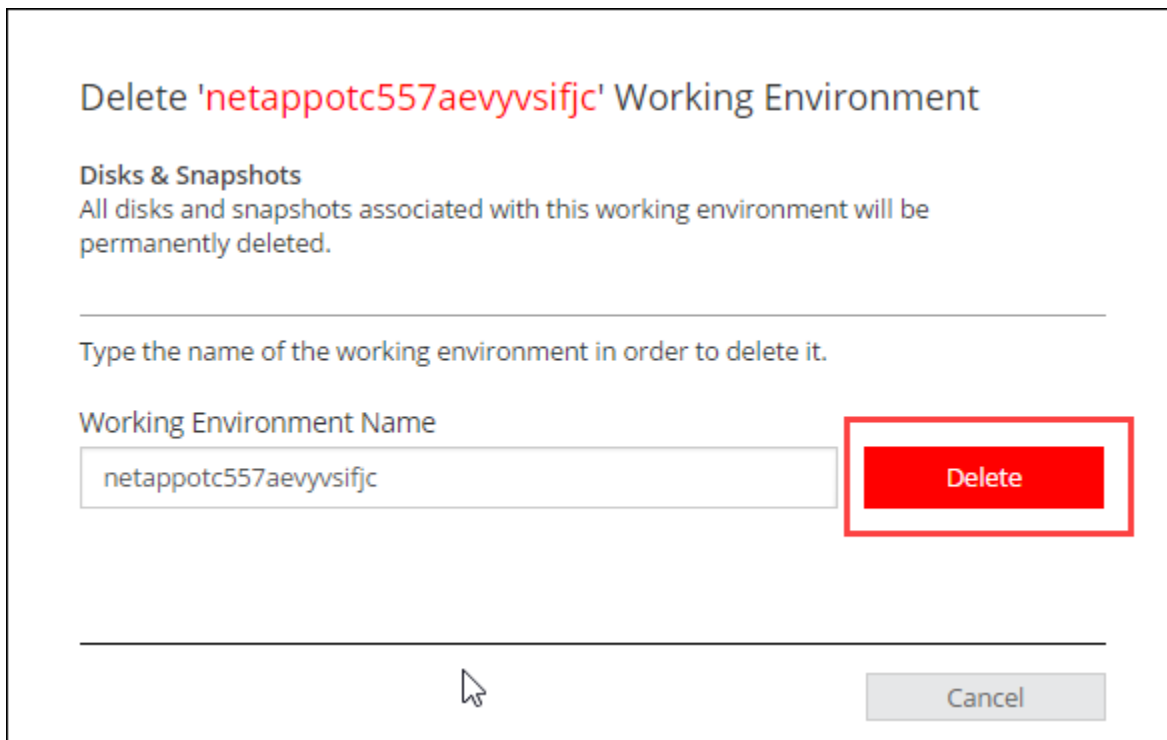
21. Double click on the ONTAP environment that was created using the template.



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

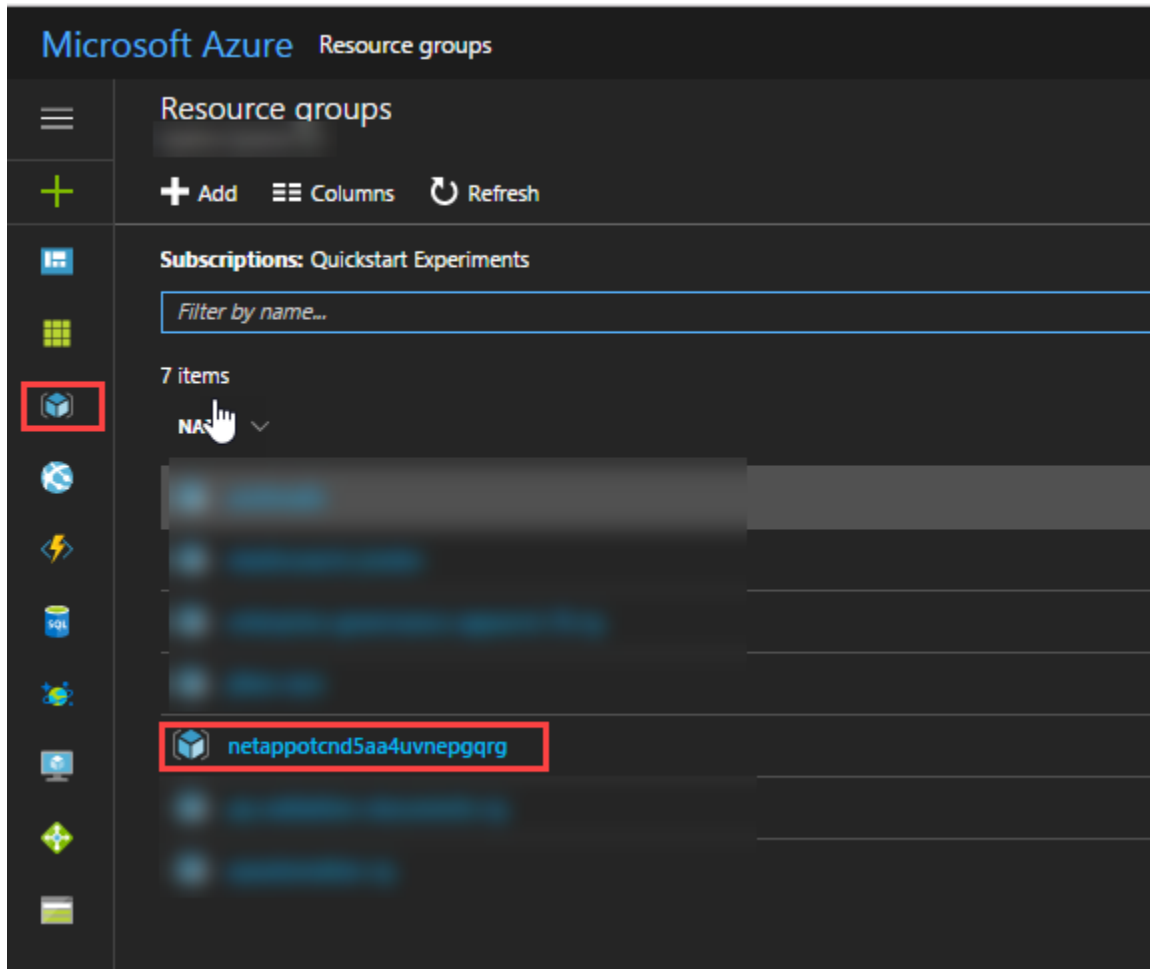


23. Enter the working environment name in the space provided and click on **Delete**. Deleting would take some time to happen.

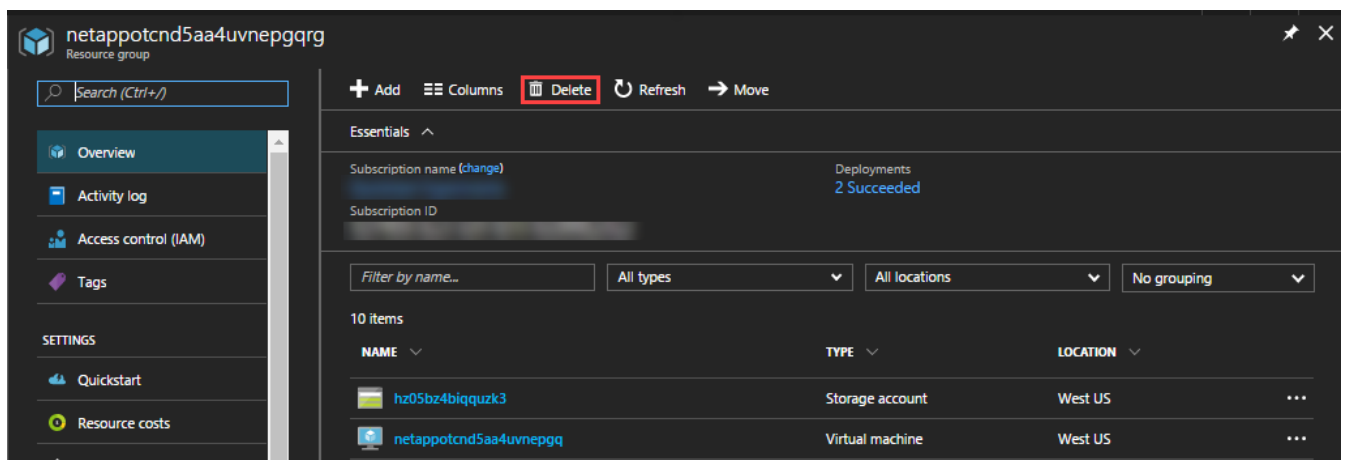


Deleting the Resource Groups from the Azure Portal


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**.










Warning! Deleting the "netappotcnd5aa4uvnpgqrg" resource group is irreversible. The action you're about to take can't be undone. Going further will delete this resource group and all the resources in it permanently.

TYPE THE RESOURCE GROUP NAME:

Affected resources

There are 10 resources in this resource group that will be deleted.

NAME	KIND	LOCATION	TYPE
 netappotcnd5aa4uvnpgq		West US	Virtual machi...
 netappotcnd5aa4uvnpgq-nic0		West US	Network inte...
 netappotcnd5aa4uvnpgq-nic1		West US	Network inte...
 netappotcnd5aa4uvnpgq-nic2		West US	Network inte...
 netappotcnd5aa4uvnpgq-nic3		West US	Network inte...
 netappotcnd5aa4uvnpgq-nic4		West US	Network inte...
 netappotcnd5aa4uvnpgq-nic5		West US	Network inte...

- Similarly delete the other resource group which was created using the template.

Security

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.

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.

Troubleshooting

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

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

Support

For any support related questions, issues or customization requirements, please contact info@spektrasystems.com.