# Project- Automating Workloads with ARM Templates

## Business Scenario

The Rand Enterprises Corporation's wants to test ARM template to bring infrastructure as code into practice. They have decided to work on project **RandEnt** to verify the functionality.

The operations team at Rand decides to define entire networking architecture using ARM template, once that's in place they intended to create the storage account along with virtual machine housing their application.

As Rand Enterprises works extensively on delivering Image based content for their global audience, they are seeking to improve the performance on that aspect. To facilitate the same, they have decided to introduce Azure CDN of **_Standard_Akamai_** SKU.

Expectation of the operation team is to Rather than deploying resources in Azure independently, they should leverage Azure ARM templates to deploy and provision all resources in templatize format.

## Overview

The main tasks for this exercise are as follows:

1. Define the network
2. Extend that with Compute & Storage
3. Create the Storage account for Images & implement CDN

# Exercise 1: Define the network

Create a virtual network template using Visual Studio and deploy it to your Azure subscription.

## Task 1: Deploy a virtual network with a template

1. Log in to the Azure portal using subscription credentials - [Azure portal](#)

2. Open Visual Studio. The shortcut should be available on the desktop.

3. Choose **File**, **New Project**, then choose **Cloud**, and then **Azure Resource Group**.
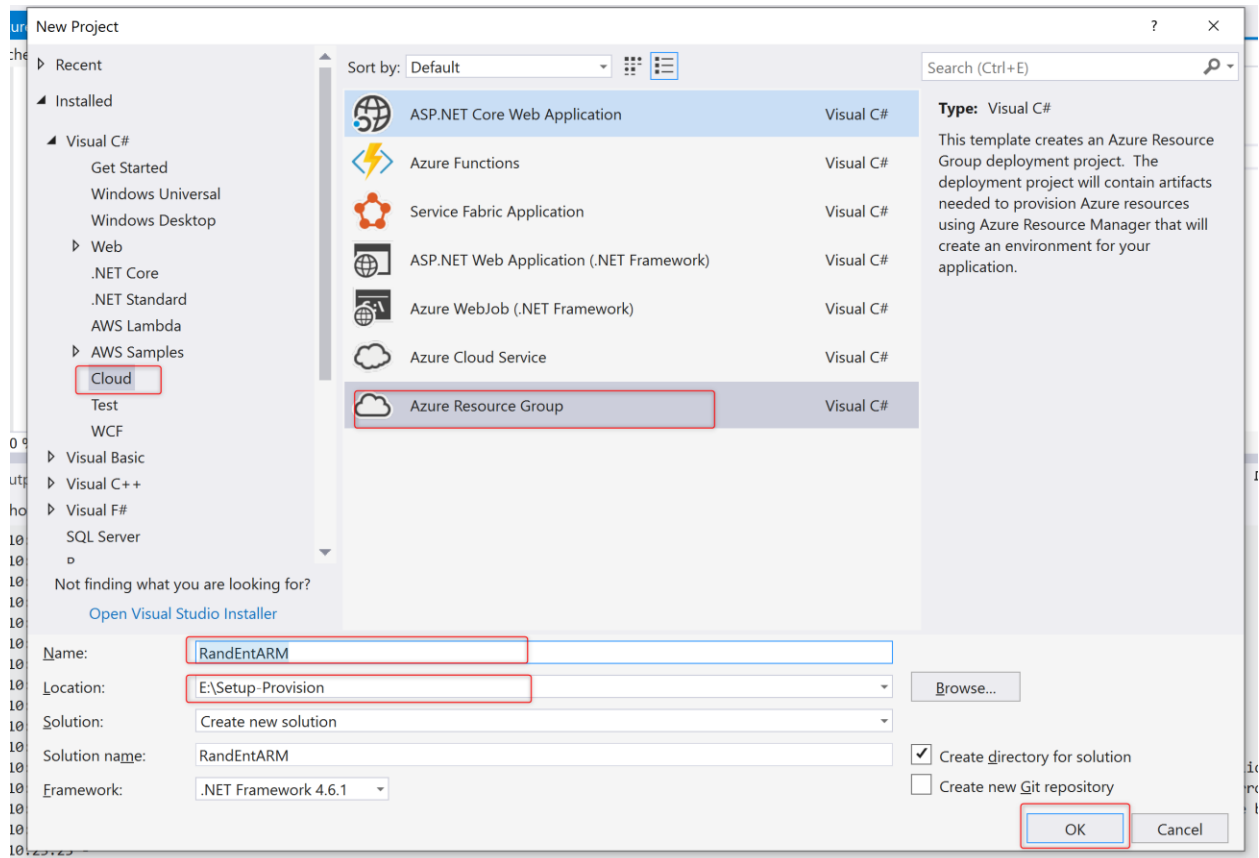


4. Name the project **RandEntARM** and specify **E:\Setup-Provision** for the location and click **OK**.

5. On the Select Azure Template dialog box choose the **Blank Template** and click **OK**. Scroll down to the end to select this option.
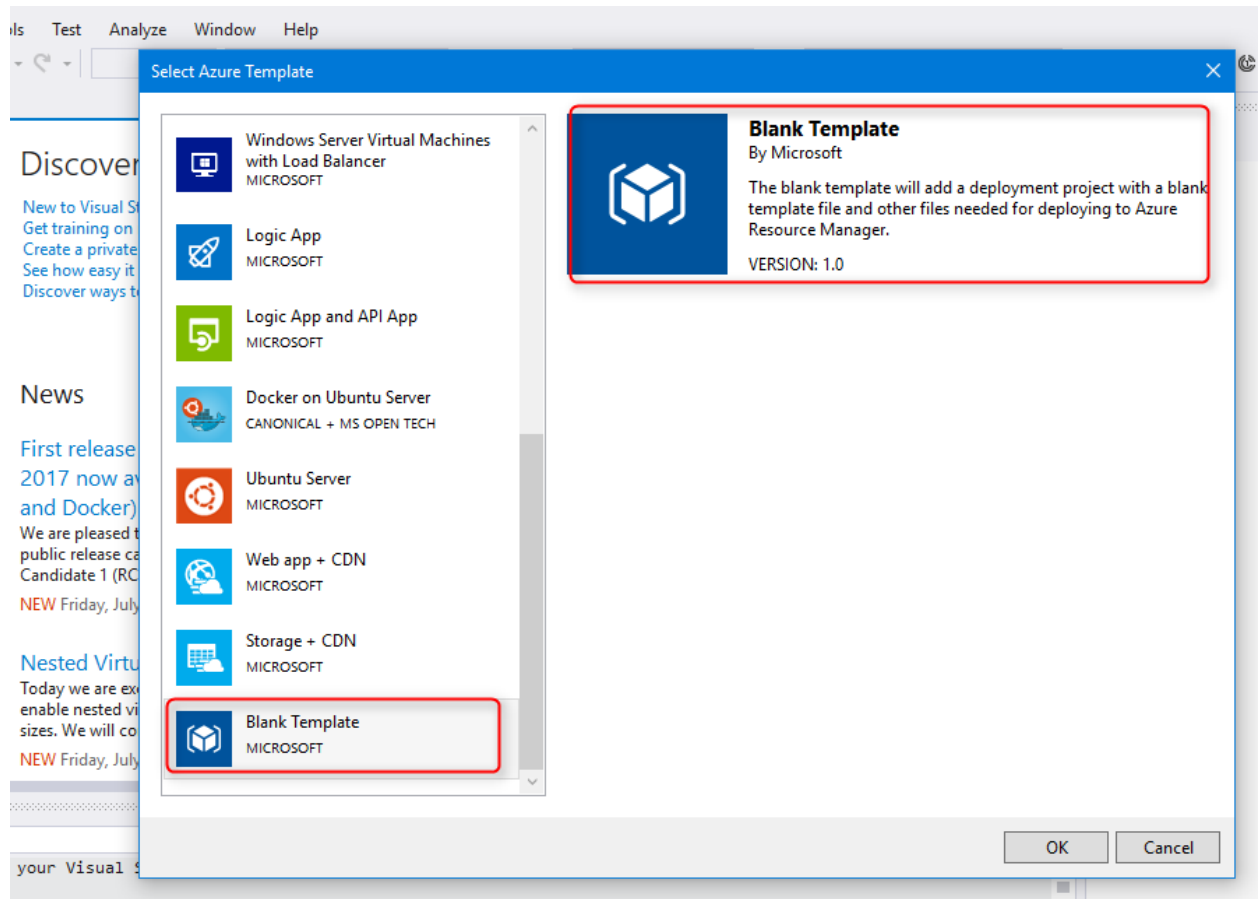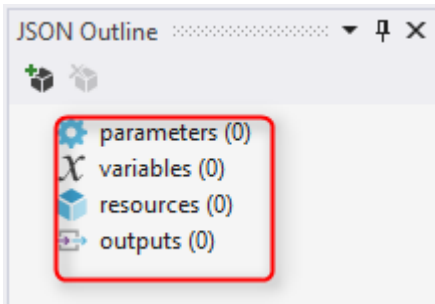
6. In the **Solution Explorer** open the **azuredeploy.json**.
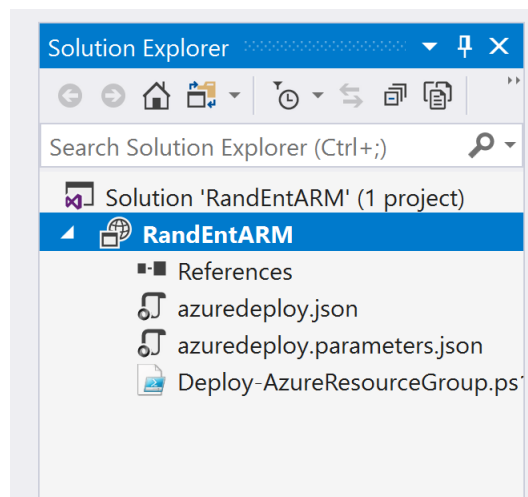


7. The file should contain four different sections: parameters, variables, resources, and outputs. On the left side a new window called **JSON Outline** should have been opened

as well. If this was not the case, go to the **View** menu->**Other Windows** and choose **JSON Outline**. The window should look like this:



8. On the **JSON Outline** window click the **Add Resource** button in the upper-left corner, or right-click the **resources** and choose **Add New Resource**.
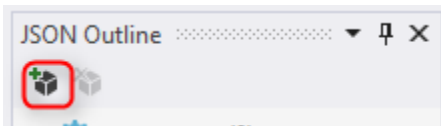


9. On the **Add Resource** dialog box choose **Virtual Network**, enter **RandEntVnet** in the **Name** field, and click **Add**.
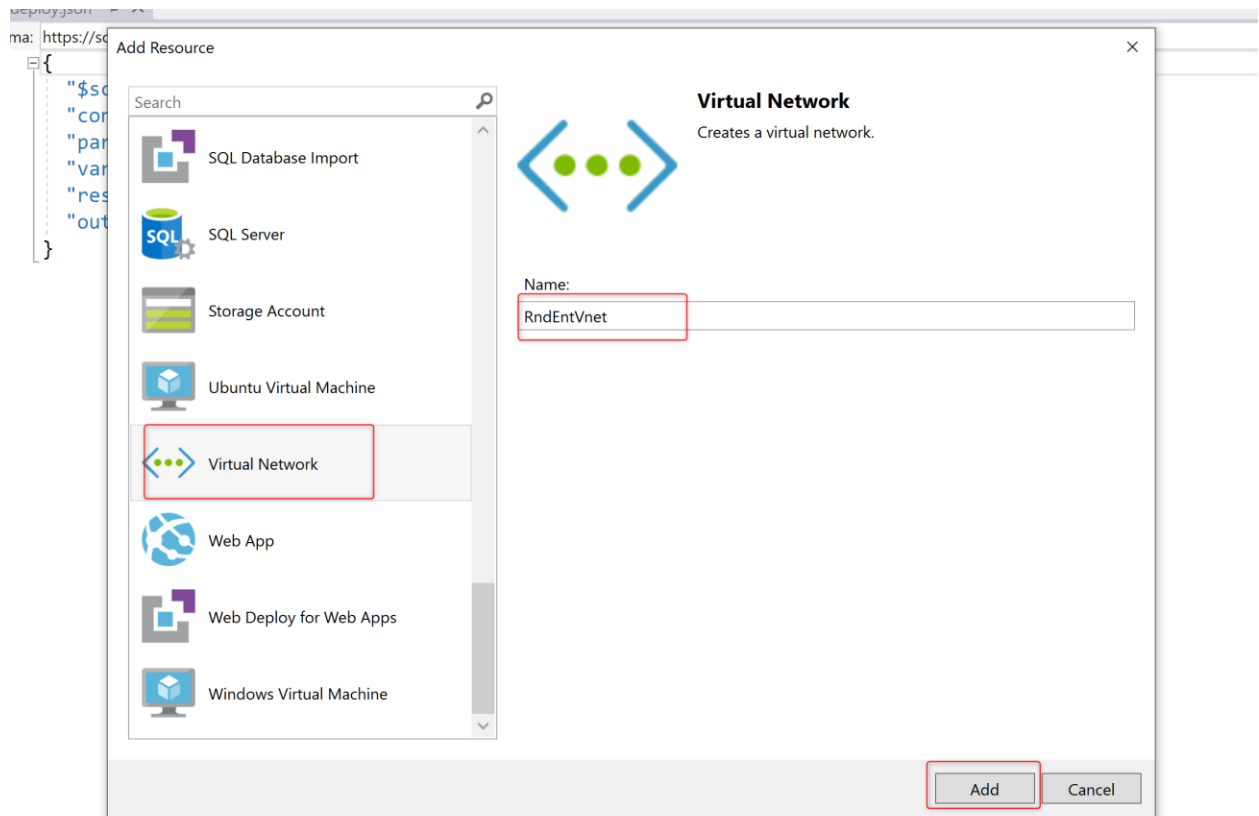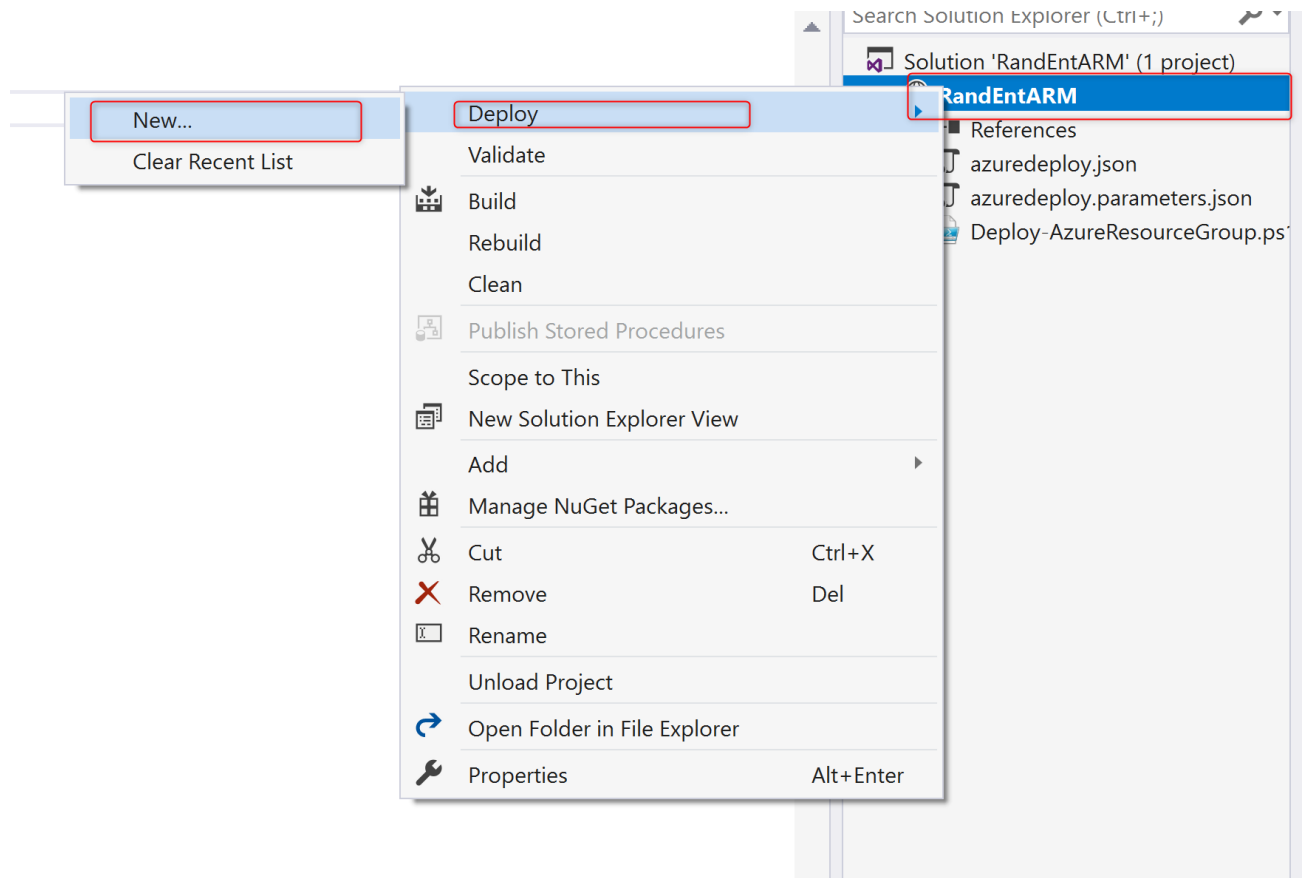
10. Go to the **azuredeploy.json** file, and inspect its content. Review the **variables** section. It should look like this:

```
"variables": {
    " RndEntVnetVnetPrefix": "10.0.0.0/16",
    " RndEntVnetSubnet1Name": "Subnet-1",
    "RndEntVnetSubnet1Prefix": "10.0.0.0/24",
    "RndEntVnetSubnet2Name": "Subnet-2",
    "RndEntVnetSubnet2Prefix": "10.0.1.0/24"
}
```

11. Change the name of **Subnet-1** to **FrontEndNet**, and the name of **Subnet-2** to **DatabaseNet**.

```
" RndEntVVnetSubnet1Name": "FrontEndNet",
" RndEntVnetSubnet2Name": "DatabaseNet",
```

12. Deploy the template by right-clicking the **RndEntARM** project and choosing **Deploy**->**New**.

| | | Search Solution Explorer (Ctrl+;) | |
|---|---|---|---|
| | | Solution 'RandEntARM' (1 project) | |

Menu items shown:

New...
Clear Recent List

Deploy
Validate
Build
Rebuild
Clean
Publish Stored Procedures
Scope to This
New Solution Explorer View
Add ▶
Manage NuGet Packages...
Cut                          Ctrl+X
Remove                       Del
Rename
Unload Project
Open Folder in File Explorer
Properties                   Alt+Enter

Solution Explorer items:

RandEntARM
References
azuredeploy.json
azuredeploy.parameters.json
Deploy-AzureResourceGroup.ps1

13. If you did not log on to your Microsoft Azure account already, you will be asked to do so now.

14. First fill in the email address associated with the Azure account and then click **Continue**.

15. Second, you might have to choose between a Work/School account, or Microsoft account. Microsoft account refers to a LiveId account, so depending on what kind of account you have, you should choose one or the other.



16. Enter your password and click Sign In.
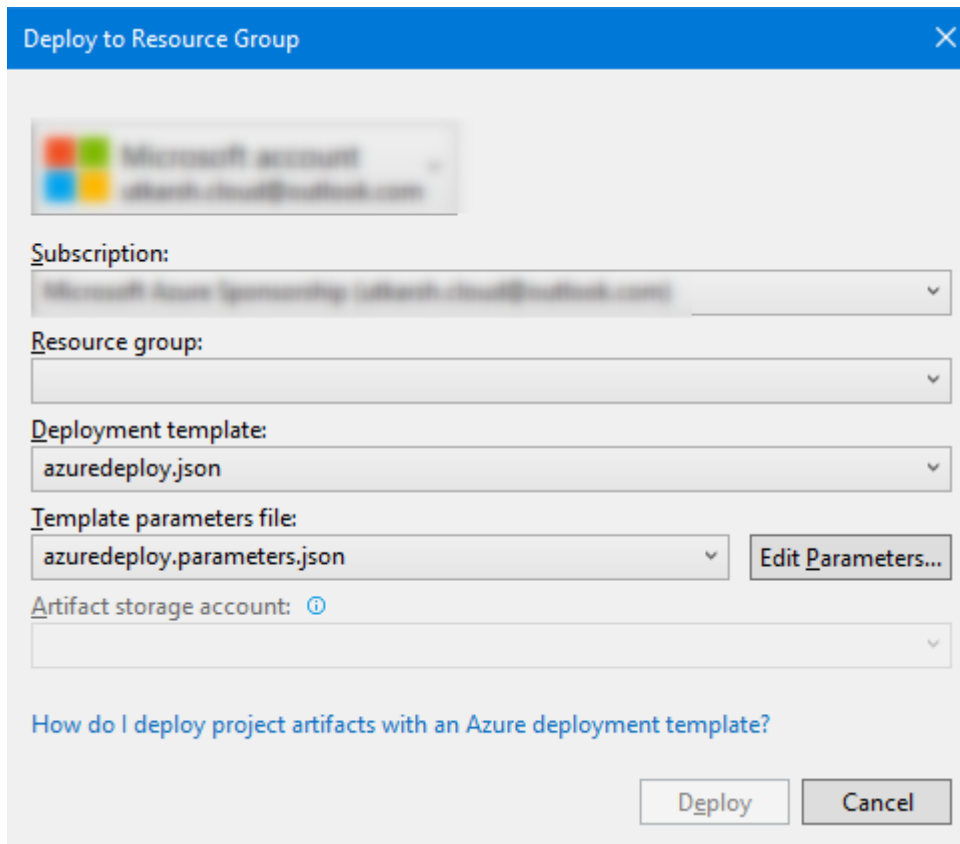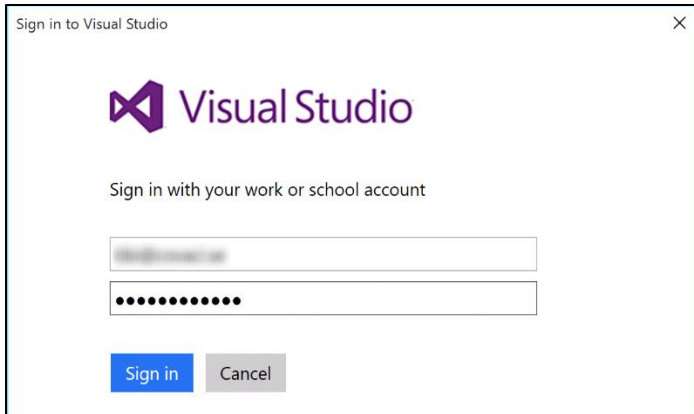
17. If you have several subscriptions, choose the one that you want your VNet to be deployed to, and on the Resource Group choose Create New.

18. On the Create Resource Group dialog box accept the default value for the name; and for the location, choose the closest location to you, and click Create.
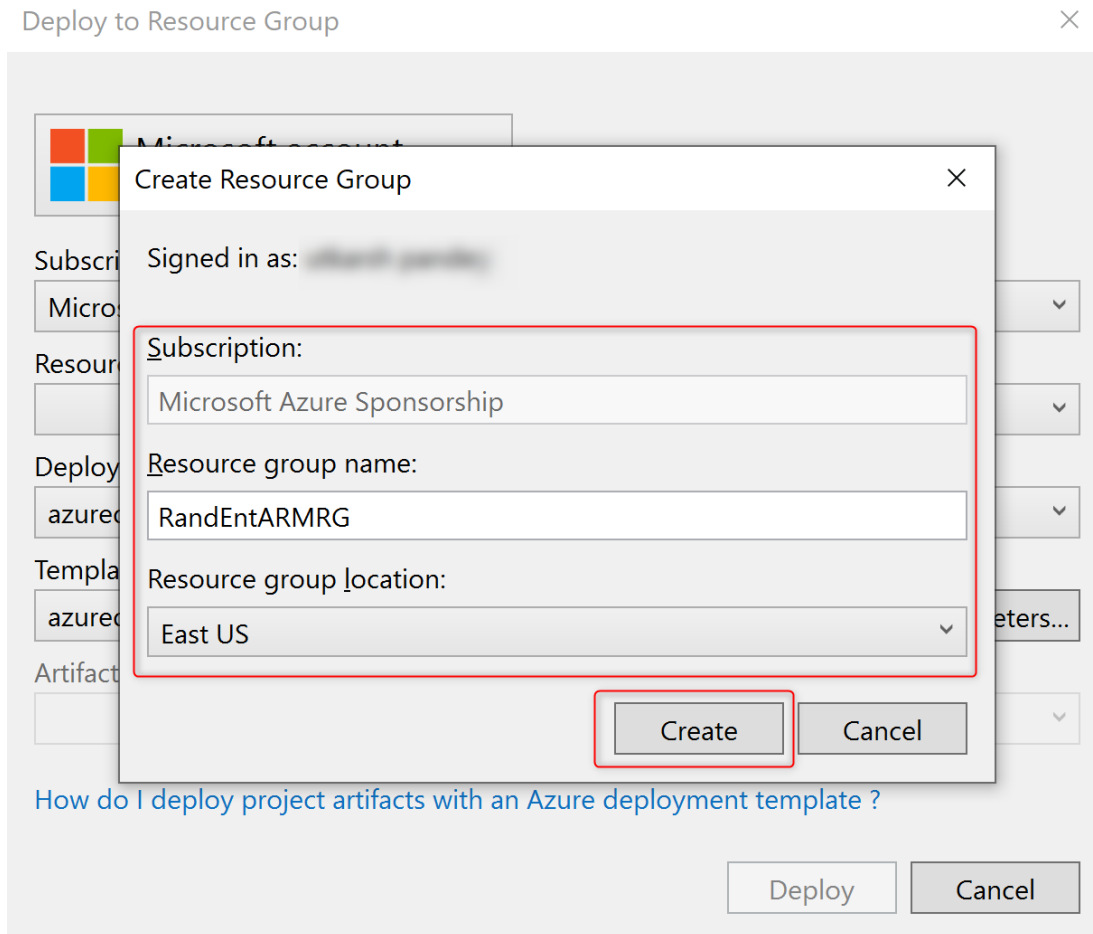
19. When you are back on the Deploy to Resource Group dialog box, click Deploy. After about a minute, your virtual network will be deployed to Azure.

20. View the created resource group and virtual network in the Azure Management Portal by clicking the Resource Groups button and clicking the name of your resource group.



## Summary

In this exercise, team has created a new virtual network with two different subnets. To verify this, log on to the **Microsoft Azure** portal and go to **Virtual Networks**. Your new network should be listed there.

# Exercise 2: Extend with Compute

In this Exercise team will continue the work they started in the previous task by creating a storage account and adding virtual machine for the web application.

## Task 1: Add an Azure Storage Account

1. On the **JSON Outline** window click the **Add Resource** button in the upper-left corner, or right-click the **resources** and choose **Add New Resource**.
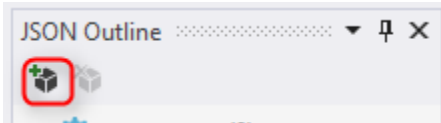


2. Add a new **Storage Account** resource to the template named *rndent*
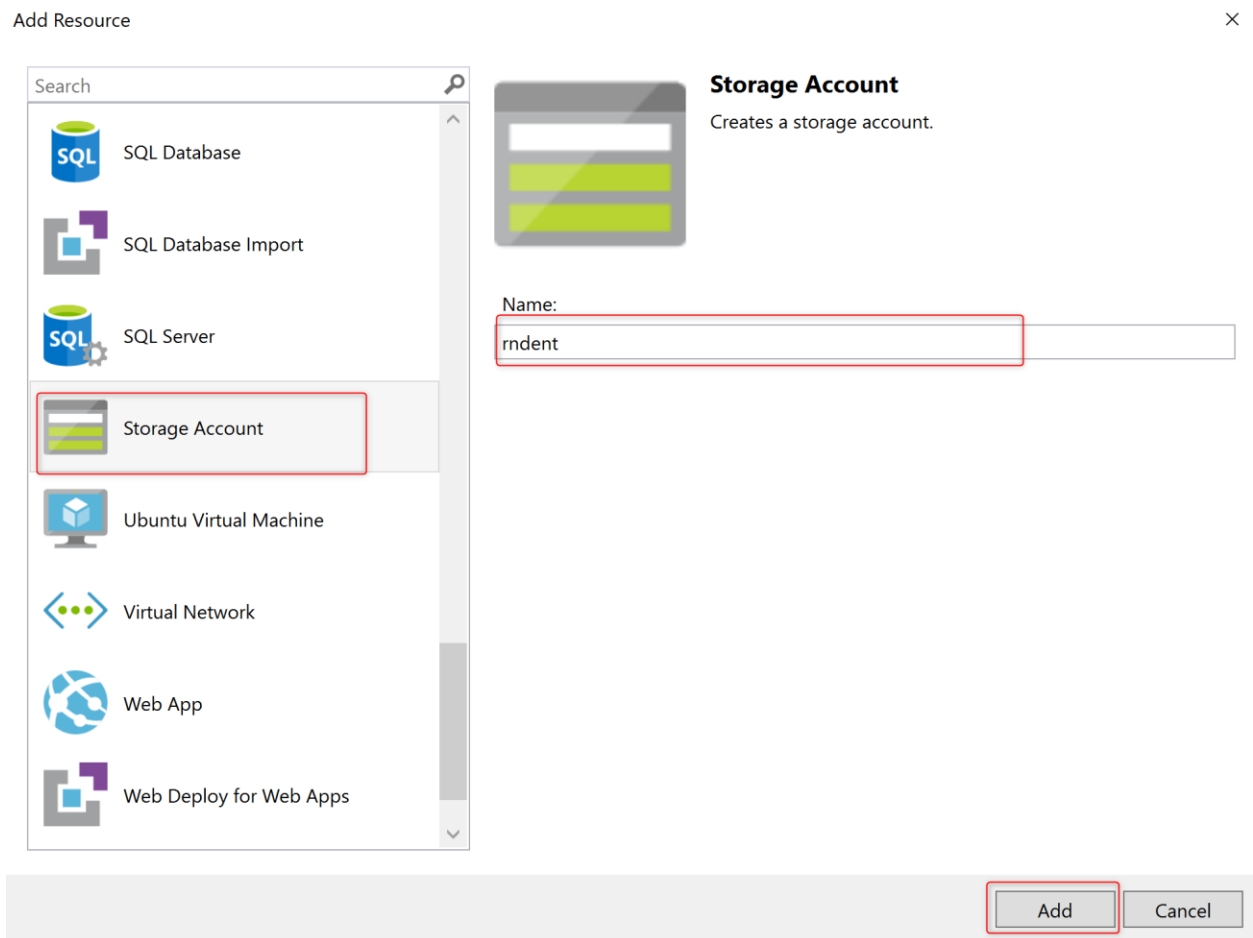
## Task 2: Add a virtual machine

1. Add a new Windows virtual machine called **RNDEntVM** and choose *rndent* as the Storage account and FrontEndNet subnet as the Virtual network/subnet. The FrontEndNet is the value of RndEntVnetSubnet1Name variable.



2. A Network Interface Card called *RNDEntVMNic* was automatically added to the configuration when the virtual machine resource was added to connect the virtual machine to the virtual network. Add a public IP address called *RndEntPublicIP* to the RNDEntVMNic. This will allow you to connect to the machine using Remote Desktop Client, or to access the web server.
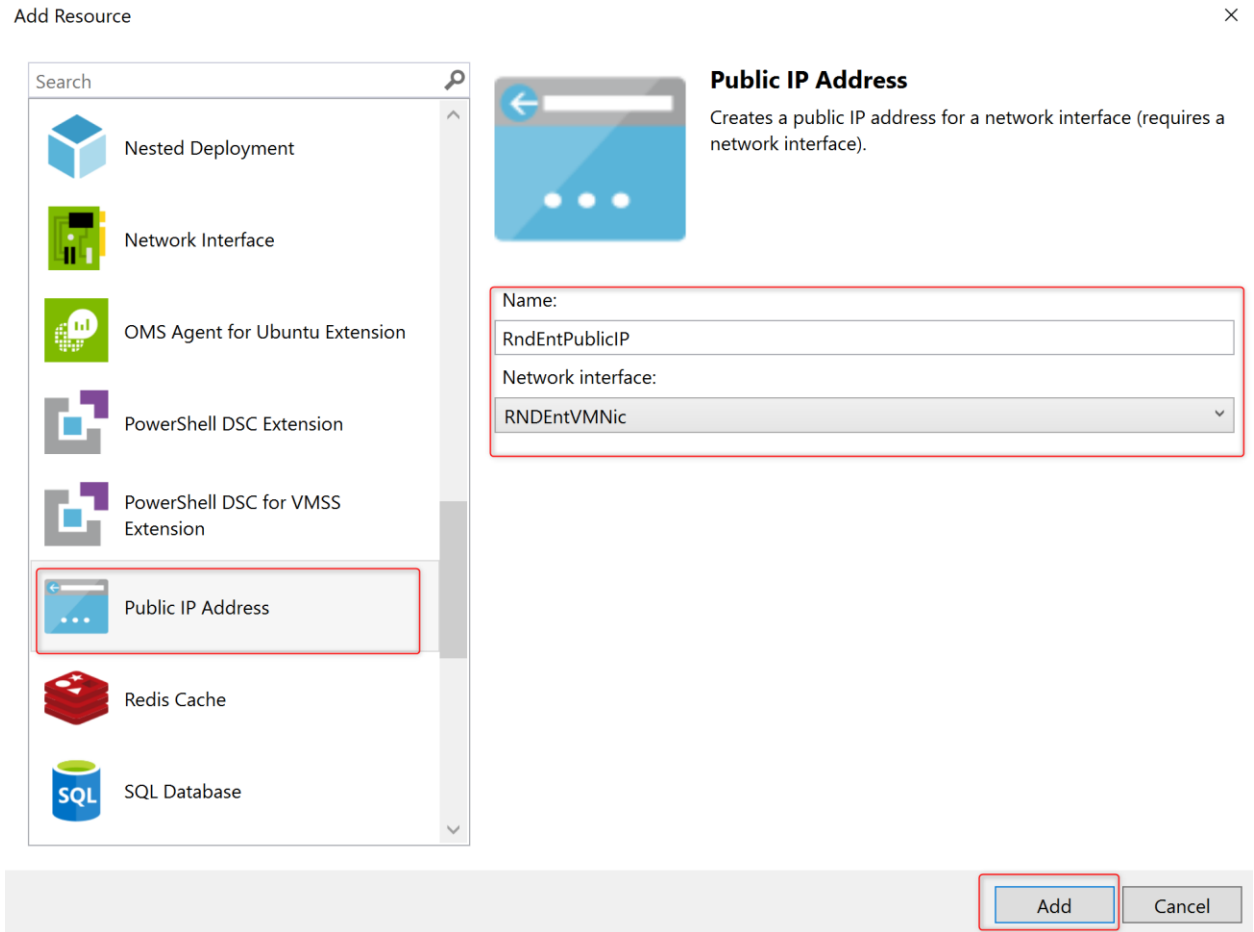
3. Save and close the file and go back to the **azuredeploy.json** template file.

4. Add a new parameter to the end of the parameters section of the **azuredeploy.json** file.

5. In the "variables" section change the value of `RNDEntVMVmSize` to `" Standard_D2_v2"`

```
    "variables": {
        "RndEntVnetPrefix": "10.0.0.0/16",
        "RndEntVnetSubnet1Name": "FrontEndNet",
        "RndEntVnetSubnet1Prefix": "10.0.0.0/24",
        "RndEntVnetSubnet2Name": "DatabaseNet",
        "RndEntVnetSubnet2Prefix": "10.0.1.0/24",
        "rndentName": "[concat('rndent', uniqueString(resourceGroup().id))]",
        "RNDEntVMImagePublisher": "MicrosoftWindowsServer",
        "RNDEntVMImageOffer": "WindowsServer",
        "RNDEntVMOSDiskName": "RNDEntVMOSDisk",
        "RNDEntVMVmSize": "Standard_D2_v2",
        "RNDEntVMVnetID": "[resourceId('Microsoft.Network/virtualNetworks', 'RndEntVnet')]",
        "RNDEntVMSubnetRef": "[concat(variables('RNDEntVMVnetID'), '/subnets/', variables('RndEntVnetSubnet1I
        "RNDEntVMStorageAccountContainerName": "vhds",
        "RNDEntVMNicName": "[concat(parameters('RNDEntVMName'), 'NetworkInterface')]",
        "RndEntPublicIPName": "RndEntPublicIP"
    },
```

## Task 3: Execute

1.  Create a new deployment again to the same resource group as the previous exercise.
    Ensure you click **New Deployment** to preserve your deployment history.

    On the **Deploy to Resource Group** dialog box, click **Edit Parameters** and populate the
    empty values.

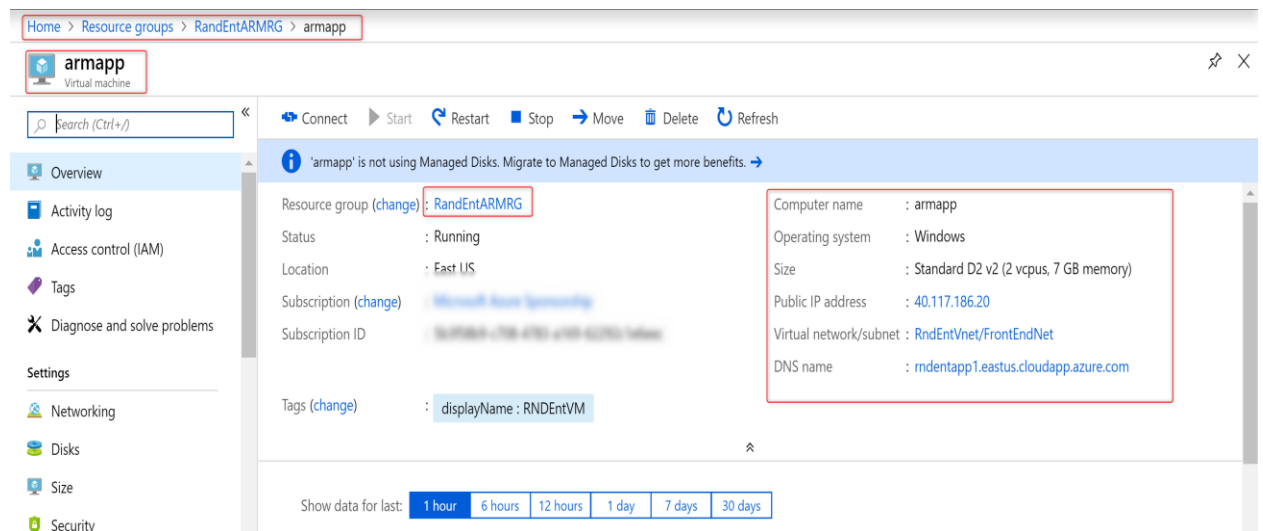    Edit Parameters...
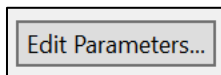
    - RndEntPublicIPDnsName: Choose a unique looking DNS name

    - RNDEntVMName: armapp

    - RNDEntVMAdminUserName: demouser

    - RNDEntVMAdminPassword: demo@pass1
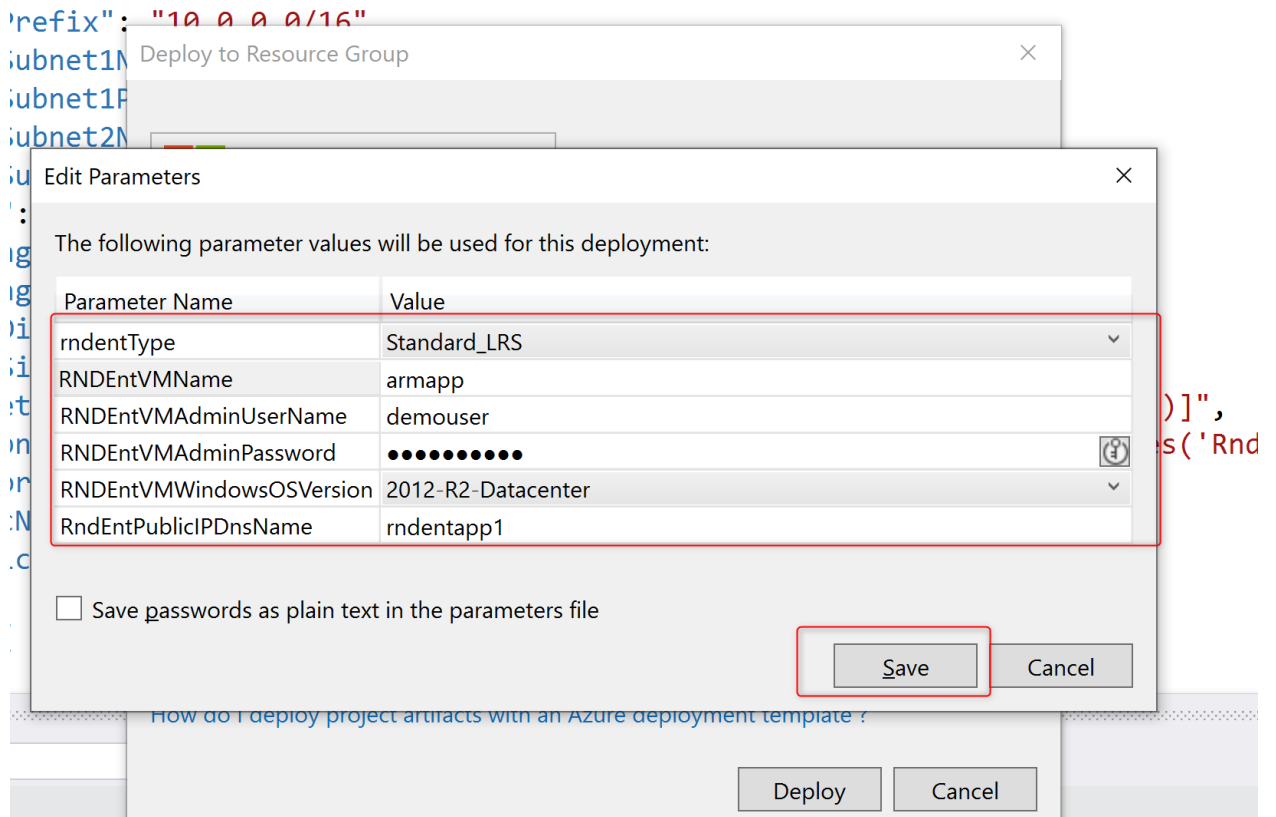
click **Deploy**.

2. Launch the **Azure Preview Portal** and navigate to the resource group you deployed to. Click the **virtual machine** for the web server and then click the **public IP**.



3. Copy the **DNS Name** and navigate to it in the browser.

# Exercise 3: Create the Storage account for Images & implement CDN

In this Exercise team will continue the work they started in the previous task by creating a storage account and implementing Azure CDN for that.

## Task 1: Add an Azure Storage Account

1. On the **JSON Outline** window click the **Add Resource** button in the upper-left corner, or right-click the **resources** and choose **Add New Resource**.
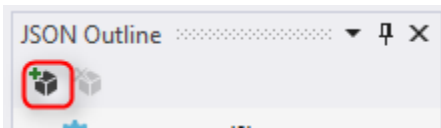


2. Add a new **Storage Account** resource to the template named *rndimg*
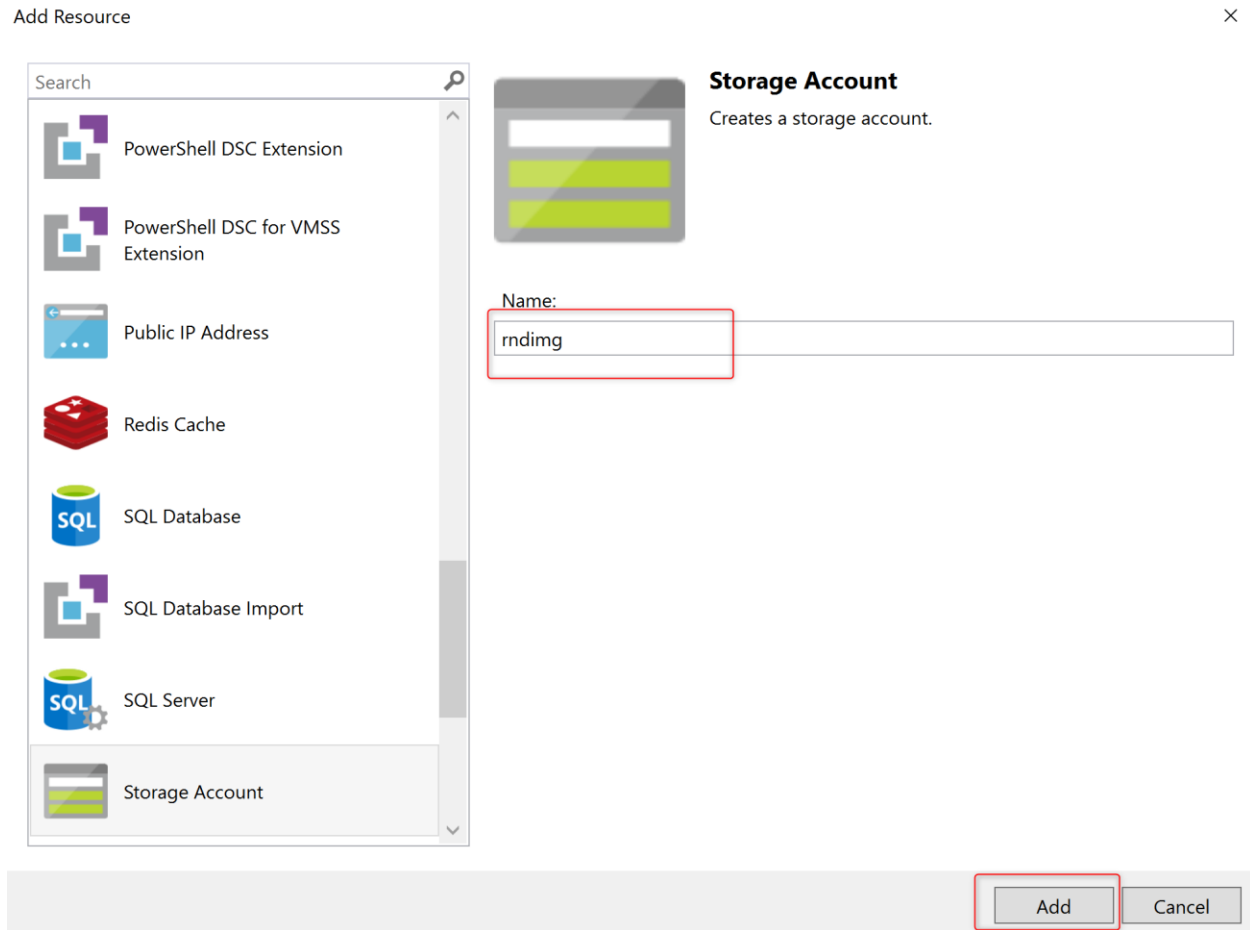
## Task 2: Add the CDN Profile

1. On the **JSON Outline** window click the **Add Resource** button in the upper-left corner, or right-click the **resources** and choose **Add New Resource**.



2. Add CDN Profile

## Task 2: Add CDN EndPoint

1. On the **JSON Outline** window click the **Add Resource** button in the upper-left corner, or right-click the **resources** and choose **Add New Resource**.
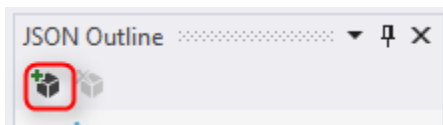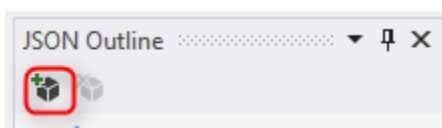


2. Create a new CDN Endpoint

3. Remove the originUrl from parameter section (right click and delete)-

4. Update the sku to "Standard_Akamai"



5. Update the properties and origin sections-

```
"properties": {
  "originHostHeader": "[replace(replace(reference(variables('rndimgName')).primaryEndpoints.blob,'https://',''),'/',''))]",
  "isHttpAllowed": true,
  "isHttpsAllowed": true,
  "queryStringCachingBehavior": "IgnoreQueryString",
  "contentTypesToCompress": [
    "text/plain",
    "text/html",
    "text/css",
    "application/x-javascript",
    "text/javascript"
  ],
  "isCompressionEnabled": "True",
  "origins": [
    {
      "name": "origin1",
      "properties": {
        "hostName": "[replace(replace(reference(variables('rndimgName')).primaryEndpoints.blob,'https://',''),'/',''))]"
      }
    }
  ]
}
```

## rndep1466vtpc3gh7im (rndentprfl/rndep1466vtpc3gh7im)
Endpoint

+ Custom domain    ⟳ Purge    ■ Stop    🗑 Delete

| Overview | Resource group (change) | : RandEntARMRG | | Endpoint hostname | : https://rndep1466vtpc3gh7im.azureedge.net |
|---|---|---|---|---|---|

Resource group (change)  : RandEntARMRG

Status                    : Running

Location                  : East US

Subscription (change)     : Microsoft Azure Sponsorship

Subscription ID           :

Endpoint hostname   : https://rndep1466vtpc3gh7im.azureedge.net

Origin hostname     : https://rndimg466vtpc3gh7im.blob.core.windows.net

Protocols           : HTTP, HTTPS

Optimization type   : General web delivery

**Navigation pane:**
- Overview
- Activity log
- Access control (IAM)
- Tags
- Diagnose and solve problems

Settings
- Origin
- Custom domains
- Compression
- Caching rules
- Geo-filtering
- Optimization
- Locks

### Custom domains

| HOSTNAME | CUSTOM HTTPS | DETAILS |
|---|---|---|
| There are no custom domains to display | | |

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Final Result-

## RandEntARMRG
Resource group

+ Add    ▦ Edit columns    🗑 Delete resource group    ⟳ Refresh    → Move    Assign tags    🗑 Delete    ⬇ Export to CSV

Subscription (change)  : Microsoft Azure Sponsorship          Deployments : 3 Succeeded

Subscription ID        :

Tags (change)          : Click here to add tags

**Navigation pane:**
- Overview
- Activity log
- Access control (IAM)
- Tags
- Events

Settings
- Quickstart
- Resource costs
- Deployments
- Policies
- Properties
- Locks
- Automation script

Monitoring
- Insights (preview)

Filter by name...    All types    All locations    No grouping

8 items    ☐ Show hidden types ⓘ

| NAME | TYPE | LOCATION | |
|---|---|---|---|
| armapp | Virtual machine | East US | ... |
| armappNetworkInterface | Network interface | East US | ... |
| rndent466vtpc3gh7im | Storage account | East US | ... |
| rndentprfl | CDN profile | East US | ... |
| rndep1466vtpc3gh7im (rndentprfl/rndep1466vtpc3gh7im) | Endpoint | East US | ... |
| RndEntPublicIP | Public IP address | East US | ... |
| RndEntVnet | Virtual network | East US | ... |
| rndimg466vtpc3gh7im | Storage account | East US | ... |