1. *What are different artifacts you need to create - name of the artifacts and its purpose -*

***Solution:***

Artifacts which needs to be created by me for automating the solution using Azure DevOps and ARM Templates are mentioned below:

1. **Azure DevOps Organization**(Considering the fact that I do not have one already) 🡪

To use Azure DevOps, first step is to create an Azure DevOps Organization which will host various projects.

1. **Azure DevOps project** needs to be created under DevOps Organization🡪

* This Project should be kept as private and access should be granted to selected persons only.
* This Project contains all the DevOps functionalities like Boards, Pipelines, Artifacts, Repos and Test Plans
* Can also provide and restrict permission to certain users by navigating to Project Settings > Teams and Permissions

1. **ARM Template**🡪 To create an ARM Template, I will be creating a Template file and a Parameters file.
2. **Template File**: This will contain information about the resources to be created, also will declare the variables and parameters to be used here.
3. **Parameters File**: This will contain the actual values of parameters to be passed into the Template file like the name of VM, size of the VM etc.
4. **Azure Key Vault 🡪**

* To store the passwords such as Virtual machine Admin password, a Key Vault needs to be created.
* A secret and its value needs to be created inside this Key Vault
* Permissions needs to be granted to the ARM Template to access this Key Vault.

1. **GitHub Repository🡪**

* A new GitHub repository needs to be created to keep the ARM templates files.

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1. *List the tools you will to create and store the ARM templates.*

***Solution:***

1. Since ARM Templates are JSON Files, I will need a JSON editor like **Visual Studio Code.**
2. Azure Resource Manager (ARM) Tools extension needs to be installed in Visual Studio Code.
3. To deploy the ARM Template, I can use either PowerShell or Azure CLI.
4. PowerShell or Azure CLI can either be accessed from Azure Cloud Shell or can be installed in local machine.
5. Resource Group needs to be created where this ARM Template will be deployed.
6. Created ARM template can be stored in GIT Repository or Azure Repos

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1. *Explain the process and steps to create automated deployment pipeline.*

***Solution:***

1. Go to the Azure DevOps Project created by me.
2. Navigate to Pipelines>Create New Pipeline
3. Where is your Code : select GitHub
4. Select the Repository where the code is present.
5. Configure your Pipeline: We can select from the pipelines provided by azure.
6. On the Review screen, review all the settings and then click on Save and Run.
7. Commit to the GIT Branch we desire and will provide the commit message there.
8. Wait for the Job to get completed and verify the logs.

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1. *Create a sample ARM template you will use to deploy a Windows VM of any size*

***Solution:***

1. I have created a Template to deploy a Virtual Machine, also created a parameter file which will be used for the deployment.
2. Password needs to be hard-coded in the parameter file or can also be provided while deploying the arm template to the Resource Group.
3. The method to retrieve the password from Key Vault is described and implemented in next section.
4. Template and parameter files are present in the folder on GitHub at below location:

<https://github.com/anshuktr/maersk_assignment/tree/master/Scenario-Q2/Question-4>

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1. *Explain how will you access the password stored in Key Vault and use it as Admin Password in the VM ARM template.*

***Solution:***

1. I have used below commands in PowerShell to create a Resource Group, Key Vault, a secret name and secret password:

|  |
| --- |
| New-AzResourceGroup -Name demo -Location centralus  $vaultname = "mykeyvault"  $rg = Get-AzResourceGroup -Name demo  $secretname = "vmpasswd"  New-AzKeyVault -Name $vaultname -ResourceGroupName $rg.ResourceGroupName -Location $rg.Location –EnabledForTemplateDeployment  $secretvalue = ConvertTo-SecureString -String "<**Passwordgivenhere**>” -AsPlainText –Force  Set-AzKeyVaultSecret -VaultName $vaultname -Name $secretname -SecretValue $secretvalue |

1. I then made changes to VM\_deploy.parameters file to refer the password stored in Key Vault. To achieve this, I have modified the password field as below:

|  |
| --- |
| "adminPassword": {  "reference": {  "keyVault": {  "id": "<KeyVault\_ResourceID\_given\_here>"  },  "secretName": "vmpasswd"  }  } |

1. Last step is to deploy the Virtual Machine with this new template and parameter file. Below PowerShell command can be used for the same:

|  |
| --- |
| New-AzResourceGroupDeployment -Name myvmdeployment -ResourceGroupName $rg.ResourceGroupName -TemplateFile <location of template file> -TemplateParameterFile <location of parameter file> |

1. The template and new parameter file used for this question is placed at below GITHub location:

<https://github.com/anshuktr/maersk_assignment/tree/master/Scenario-Q2/Question-5>

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