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Week3 Assignment
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Q1 & 2: Observe assigned Subscriptions Observe Azure Entra ID or create own Azure Entra ID in personal Azure account Create test users and groups Assign a RBAC role to user and test Create a custom role and assigned to users and test

Objective:

- View assigned Azure subscriptions
- Check Azure Entra ID (formerly Azure Active Directory)
- Create your own Azure Entra ID (if needed)
- Create test users and groups
- Assign RBAC role to a user and test
- Create a custom role and assign to a user and test

◆ Step-by-Step Procedure:

Step 1: Log into Azure Portal

- Go to: <https://portal.azure.com>
- Sign in with your Microsoft account.

Step 2: Observe Assigned Subscriptions

- On the left menu, click on **Subscriptions**.
- Here, you'll see the subscriptions associated with your account.
- You can check the **Subscription ID, Directory, and Billing Information**.

List of subscriptions visible.

The screenshot shows the Microsoft Azure Cost Management portal. The top navigation bar includes 'Short videos', 'Microsoft Azure', a search bar ('Search resources, services, and docs (G+)'), 'Copilot', and user information ('krti.12217521@...', 'LOVELY PROFESSIONAL UNIV'). The main title is 'Cost Management: Kriti Singh | Azure subscriptions'. On the left, a sidebar lists various management categories like Overview, Change scope, Access control, Diagnose and solve problems, Reporting + analytics, Monitoring, Optimization, Settings, Billing, Usage + charges, Invoices, Payment methods, and Azure subscriptions (which is selected). The main content area displays a table of Azure subscriptions. The table has columns: Name, ID, Plan, Invoice section, Billing profile, Status, Service tenant ID, and Month-to-date char... The single row shown is 'Azure for Students' with ID 'e09ba5dc-dac9-4055...', Plan 'Microsoft Azure Plan', Billing profile 'Kriti Singh', Status 'Active', Service tenant ID 'e14e73eb-5251-4388...', and Month-to-date charge '₹393.54'. There are also filter buttons for 'Invoice section: All invoice sections', 'Billing profile: All billing profiles', and 'Status: Any status'.

Step 3: View Azure Entra ID (AAD)

- Search for "**Azure Entra ID**" in the search bar.
- Open it and you'll see your **default directory**.
- Note the **Directory name** and **Tenant ID**.
- Note: only user administrator and global administrator can access the azure Entra id. In my case I am a student, so I am unable to access it.

Azure Entra ID Overview with error as role is student

The screenshot shows the Azure Entra ID overview page. The top navigation bar includes 'You do not have access | Overview ...'. The main message is 'You don't have access' with a lock icon. Below it, a note says 'Copy the error details and send them to your administrator(s) to get access to this page.' A 'Copy error details' button is available. The error details table includes columns for Session ID, Subscription ID, Error code, and Resource name on the left, and Resource group name, Resource ID, Details, and Insufficient privileges to complete the operation on the right. At the bottom, there are links for 'Help improve this page' and 'Give feedback'.

Error details	Resource group name
Session ID 67476b69b094837882405403baeb199	
Subscription ID	
Error code	
401	
Resource name	
	Resource ID
	Details
	Insufficient privileges to complete the operation.

Step 4: Create Your Own Entra ID (if needed)

- Go to **Azure Entra ID > Manage tenants > Create.**
- Choose:
 - **Type:** Azure Active Directory
 - **Name:** Your custom name (e.g., "MyTestDirectory")
 - Click **Review + Create**

Step 5: Switch to New Directory

- Click on your **user profile icon** in the top-right.
- Choose "**Switch directory**"
- Select the new directory you just created.

Step 6: Create Test Users and Groups

- Go to **Azure Entra ID > Users > + New User**
- Fill in:
 - **Username:** testuser1
 - **Name:** Test User One
 - **Password:** Auto-generate or custom
- Create a second user similarly (testuser2)
- Now create a group:
 - Go to **Groups > + New Group**
 - Group Type: Security
 - Name: "TestGroup"
 - Add members: Add the users you just created

Step 7: Assign a Built-in RBAC Role to User

- Go to **Subscriptions > Your Subscription**
- Click on **Access Control (IAM)**
- Click **+ Add > Add role assignment**
- Select:
 - **Role:** Reader

- **Assign access to:** User
- **Select members:** Choose "testuser1"
- Click **Review + Assign**

Step 8: Create a Custom Role

- Go to **Subscriptions > Access Control (IAM) > Roles > + Add Custom Role**
- Define:
 - **Name:** MyCustomReader
 - **Permissions:** Select only Microsoft.Resources/subscriptions/read
- Assign to **testuser2** using the same IAM > Add role assignment.

Q3: Create Virtual machine and Vnet from Azure CLI

Answer:

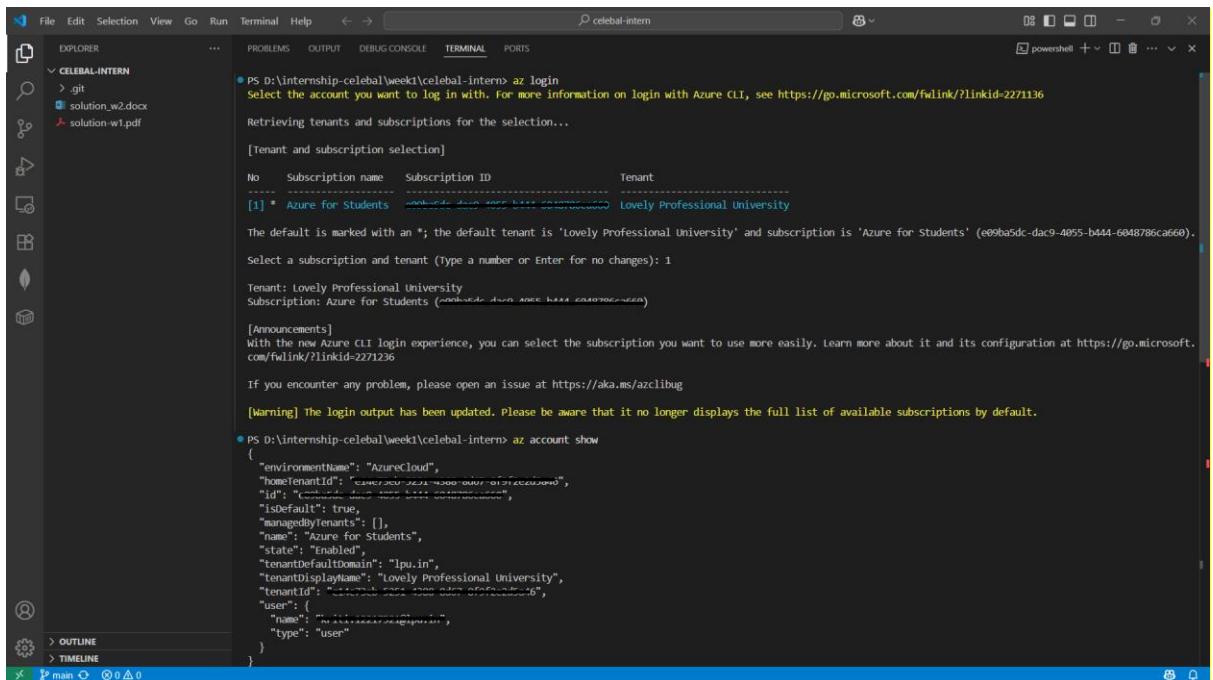
Goal:

We will use Azure CLI to:

- **Create a resource group**
- **Create a Virtual Network (VNet) and subnet**
- **Create a Linux Virtual Machine**
- **Verify the setup**

Prerequisites:

- **Logged into Azure Portal with your student account**
- **Azure CLI installed and signed in (az login)**



```

PS D:\internship-celebal\week1\celebal-intern> az login
Select the account you want to log in with. For more information on login with Azure CLI, see https://go.microsoft.com/fwlink/?linkid=2271136
Retrieving tenants and subscriptions for the selection...
[Tenant and subscription selection]
No Subscription name Subscription ID Tenant
[1] * Azure for Students e099ba5dc-dac9-4055-b444-6048786ca669 Lovely Professional University
The default is marked with an *; the default tenant is 'Lovely Professional University' and subscription is 'Azure for Students' (e099ba5dc-dac9-4055-b444-6048786ca669).
Select a subscription and tenant (Type a number or Enter for no changes): 1
Tenant: Lovely Professional University
Subscription: Azure for Students (e099ba5dc-dac9-4055-b444-6048786ca669)

[Announcements]
With the new Azure CLI login experience, you can select the subscription you want to use more easily. Learn more about it and its configuration at https://go.microsoft.com/fwlink/?linkid=2271236

If you encounter any problem, please open an issue at https://aka.ms/azclibug

[Warning] The login output has been updated. Please be aware that it no longer displays the full list of available subscriptions by default.

PS D:\internship-celebal\week1\celebal-intern> az account show
{
  "environmentName": "AzureCloud",
  "homeTenantId": "e099ba5dc-dac9-4055-b444-6048786ca669",
  "id": "e099ba5dc-dac9-4055-b444-6048786ca669",
  "isDefault": true,
  "managedByTenants": [],
  "name": "Azure for Students",
  "state": "Enabled",
  "tenantDefaultDomain": "lpu.in",
  "tenantDisplayName": "Lovely Professional University",
  "tenantId": "e099ba5dc-dac9-4055-b444-6048786ca669",
  "user": {
    "name": "naveenreddy@lpu.in",
    "type": "user"
  }
}

```

Step 1: Create a Resource Group

"Now, I will create a resource group in the Central India region where all my resources will be organized."

```
az group create --name myResourceGroup --location centralindia
```

Terminal after running this command (show the success JSON output with "provisioningState": "Succeeded")

```
PS D:\internship-celebal\week1\celebal-intern> az group create --name myResourceGroup --location centralindia
{
  "id": "/subscriptions/e09ba5dc-dac9-4055-b444-6048786ca660/resourceGroups/myResourceGroup",
  "location": "centralindia",
  "managedBy": null,
  "name": "myResourceGroup",
  "properties": {
    "provisioningState": "Succeeded"
  },
  "tags": null,
  "type": "Microsoft.Resources/resourceGroups"
}
PS D:\internship-celebal\week1\celebal-intern>
```

Step 2: Create a Virtual Network and Subnet

"Next, I will create a Virtual Network (VNet) with an address range and a default subnet inside it."

```
az network vnet create --resource-group myResourceGroup --name myVnet
--address-prefix 10.0.0.0/16 --subnet-name mySubnet --subnet-prefix 10.0.1.0/24
```

Terminal output showing VNet and subnet creation (look for "provisioningState":

"Succeeded" and names)

```
PS D:\internship-celebal\week1\celebal-intern> az network vnet create --resource-group myResourceGroup --name myVnet --address-prefix 10.0.0.0/16 --subnet-name mySubnet
--subnet-prefix 10.0.1.0/24 --location centralindia
{
  "newVNet": {
    "addressSpace": {
      "addressPrefixes": [
        "10.0.0.0/16"
      ]
    },
    "enableDdosProtection": false,
    "etag": "w/"ca5233c9-7f07-4094-9b12-6fcc759304e3"",
    "id": "/subscriptions/e09ba5dc-dac9-4055-b444-6048786ca660/resourceGroups/myResourceGroup/providers/Microsoft.Network/virtualNetworks/myVnet",
    "location": "centralindia",
    "name": "myVnet",
    "privateEndpointVNetPolicies": "Disabled",
    "provisioningState": "Succeeded",
    "resourceGroup": "myResourceGroup",
    "resourceGuid": "6b466099-a75a-4043-aae6-a02af16ad857",
    "subnets": [
      {
        "addressPrefix": "10.0.1.0/24",
        "delegations": [],
        "etag": "w/"ca5233c9-7f07-4094-9b12-6fcc759304e3"",
        "id": "/subscriptions/e09ba5dc-dac9-4055-b444-6048786ca660/resourceGroups/myResourceGroup/providers/Microsoft.Network/virtualNetworks/myVnet/subnets/mySubnet",
        "name": "mySubnet",
        "privateEndpointNetworkPolicies": "Disabled",
        "privateLinkServiceNetworkPolicies": "Enabled",
        "provisioningState": "Succeeded",
        "resourceGroup": "myResourceGroup",
        "type": "Microsoft.Network/virtualNetworks/subnets"
      }
    ],
    "type": "Microsoft.Network/virtualNetworks",
    "virtualNetworkPeerings": []
  }
}
```

Step 3: Create a Public IP Address

"Now, I will create a public IP for the VM to connect externally."

```
az network public-ip create --resource-group myResourceGroup --name
myPublicIP
```

Note: we can add location to avoid non zone-redundant IP

Output JSON showing the ipAddress and "provisioningState": "Succeeded"

```
PS D:\internship-celebal\week1\celebal-intern> az network public-ip create --resource-group myResourceGroup --name myPublicIP
[coming breaking change] In the coming release, the default behavior will be changed as follows when sku is Standard and zone is not provided: For zonal regions, you will get a zone-redundant IP indicated by zones:["1","2","3"]; For non-zonal regions, you will get a non zone-redundant IP indicated by zones:null.
{
  "publicIp": {
    "ddosSettings": {
      "protectionMode": "VirtualNetworkInherited"
    },
    "etag": "W\\\"e475742d-a100-4f22-8d80-ce4abcb22791\\\"",
    "id": "/subscriptions/e09ba5dc-dac9-4055-b444-6048786ca660/resourceGroups/myResourceGroup/providers/Microsoft.Network/publicIPAddresses/myPublicIP",
    "idleTimeoutInMinutes": 4,
    "ipAddress": "4.247.144.180",
    "ipTags": [],
    "location": "centralindia",
    "name": "myPublicIP",
    "provisioningState": "Succeeded",
    "publicIPAddressVersion": "IPv4",
    "publicIPAllocationMethod": "Static",
    "resourceGroup": "myResourceGroup",
    "resourceGuid": "d7b2d9b3-dece-4d03-a23f-5603e1c4aa34",
    "sku": {
      "name": "Standard",
      "tier": "Regional"
    },
    "type": "Microsoft.Network/publicIPAddresses"
  }
}
PS D:\internship-celebal\week1\celebal-intern>
```

Step 4: Create a Network Security Group (NSG) and Rule

"Next, I'll secure the VM with a Network Security Group and allow SSH access (port 22)."

**az network nsg create **

**--resource-group myResourceGroup **

--name myNSG

```
PS D:\internship-celebal\week1\celebal-intern> az network nsg create --resource-group myResourceGroup --name myNSG
{
  "NewNSG": {
    "defaultSecurityRules": [
      {
        "access": "Allow",
        "description": "Allow inbound traffic from all VMs in VNET",
        "destinationAddressPrefix": "VirtualNetwork",
        "destinationAddressPrefixes": [],
        "destinationPortRange": "*",
        "destinationPortRanges": [],
        "direction": "Inbound",
        "etag": "W\\\"fbde6260-f547-4655-b268-86115dd00956\\\"",
        "id": "/subscriptions/e09ba5dc-dac9-4055-b444-6048786ca660/resourceGroups/myResourceGroup/providers/Microsoft.Network/networkSecurityGroups/myNSG/defaultSecurityRules/AllowNetInBound",
        "name": "AllowNetInBound",
        "priority": 65000,
        "protocol": "*",
        "provisioningState": "Succeeded",
        "resourceGroup": "myResourceGroup",
        "sourceAddressPrefix": "VirtualNetwork",
        "sourceAddressPrefixes": [],
        "sourcePortRange": "*",
        "sourcePortRanges": [],
        "type": "Microsoft.Network/networkSecurityGroups/defaultSecurityRules"
      },
      {
        "access": "Allow",
        "description": "Allow inbound traffic from azure load balancer",
        "destinationAddressPrefix": "*",
        "destinationAddressPrefixes": [],
        "destinationPortRange": "*",
        "destinationPortRanges": [],
        "direction": "Inbound",
        "etag": "W\\\"fbde6260-f547-4655-b268-86115dd00956\\\"",
        "id": "/subscriptions/e09ba5dc-dac9-4055-b444-6048786ca660/resourceGroups/myResourceGroup/providers/Microsoft.Network/networkSecurityGroups/myNSG/defaultSecurityRules/AllowAzureLoadBalancerInBound",
        "name": "AllowAzureLoadBalancerInBound",
        "priority": 65001,
        "protocol": "*",
        "provisioningState": "Succeeded",
        "resourceGroup": "myResourceGroup",
        "sourceAddressPrefix": "AzureLoadBalancer",
        "type": "Microsoft.Network/networkSecurityGroups/defaultSecurityRules"
      }
    ]
  }
}
```

**az network nsg rule create **

**--resource-group myResourceGroup **

**--nsg-name myNSG **

```
--name AllowSSH \
--protocol tcp \
--priority 1000 \
--destination-port-range 22 \
--access allow
```

NSG and rule creation outputs (especially AllowSSH rule shown in JSON)

```
ps D:\internship-celebal\week1\celebal-intern> az network nsg rule create --resource-group myResourceGroup --nsg-name myNSG --name AllowSSH --protocol tcp --priority 1000 --destination-port-range 22 --access allow
{
  "access": "Allow",
  "destinationAddressPrefix": "*",
  "destinationAddressPrefixes": [],
  "destinationPortRange": "22",
  "destinationPortRanges": [],
  "direction": "Inbound",
  "etag": "W/\"2877f981-a580-4ad2-afee-69363aa778f1\"",
  "id": "/subscriptions/e09ba5dc-dac9-4055-b444-6048786ca660/resourceGroups/myResourceGroup/providers/Microsoft.Network/networkSecurityGroups/myNSG/securityRules/AllowSSH",
  "name": "AllowSSH",
  "priority": 1000,
  "protocol": "Tcp",
  "provisioningState": "Succeeded",
  "resourceGroup": "myResourceGroup",
  "sourceAddressPrefix": "*",
  "sourceAddressPrefixes": [],
  "sourcePortRange": "*",
  "sourcePortRanges": [],
  "type": "Microsoft.Network/networkSecurityGroups/securityRules"
}
ps D:\internship-celebal\week1\celebal-intern>
```

Step 5: Create a NIC (Network Interface)

"Now, I will create a network interface and attach the subnet, NSG, and public IP to it."

```
az network nic create \
--resource-group myResourceGroup \
--name myNIC \
--vnet-name myVnet \
--subnet mySubnet \
--network-security-group myNSG \
--public-ip-address myPublicIP
```

Terminal output showing "provisioningState": "Succeeded" and NIC name

```
PS D:\internship-celebal\week1\celebal-intern> az network nic create --resource-group myResourceGroup --name myNIC --vnet-name myVnet --subnet mySubnet --network-security-group myNSG --public-ip-address myPublicIP
{
  "id": "/subscriptions/e09ba5dc-dac9-4055-b444-6048786ca668/resourceGroups/myResourceGroup/providers/Microsoft.Network/networkInterfaces/myNIC",
  "location": "centralindia",
  "name": "myNIC",
  "networkSecurityGroup": {
    "id": "/subscriptions/e09ba5dc-dac9-4055-b444-6048786ca668/resourceGroups/myResourceGroup/providers/Microsoft.Network/networkSecurityGroups/myNSG"
  },
  "resourceGroup": "myResourceGroup",
  "resourceId": "/subscriptions/e09ba5dc-dac9-4055-b444-6048786ca668/resourceGroups/myResourceGroup/providers/Microsoft.Network/networkInterfaces/myNIC",
  "resourceType": "Microsoft.Network/networkInterfaces",
  "tags": null,
  "type": "Microsoft.Network/networkInterfaces"
}
{
  "id": "/subscriptions/e09ba5dc-dac9-4055-b444-6048786ca668/resourceGroups/myResourceGroup/providers/Microsoft.Network/networkInterfaces/myNIC/ipConfigurations/ipconfig1",
  "name": "ipconfig1",
  "privateIPAddress": "10.0.1.4",
  "privateIPAllocationVersion": "IPv4",
  "privateIPSubnet": "mySubnet",
  "provisioningState": "Succeeded",
  "publicIPAddress": {
    "id": "/subscriptions/e09ba5dc-dac9-4055-b444-6048786ca668/resourceGroups/myResourceGroup/providers/Microsoft.Network/publicIPAddresses/myPublicIP"
  },
  "resourceGroup": "myResourceGroup",
  "resourceId": "/subscriptions/e09ba5dc-dac9-4055-b444-6048786ca668/resourceGroups/myResourceGroup/providers/Microsoft.Network/publicIPAddresses/myPublicIP",
  "resourceType": "Microsoft.Network/publicIPAddresses",
  "subnet": {
    "id": "/subscriptions/e09ba5dc-dac9-4055-b444-6048786ca668/resourceGroups/myResourceGroup/providers/Microsoft.Network/virtualNetworks/myVnet/subnets/mySubnet"
  },
  "type": "Microsoft.Network/networkInterfaces/ipConfigurations"
}
}
{
  "id": "/subscriptions/e09ba5dc-dac9-4055-b444-6048786ca668/resourceGroups/myResourceGroup/providers/Microsoft.Network/networkInterfaces/myNIC",
  "location": "centralindia",
  "name": "myNIC",
  "networkSecurityGroup": {
    "id": "/subscriptions/e09ba5dc-dac9-4055-b444-6048786ca668/resourceGroups/myResourceGroup/providers/Microsoft.Network/networkSecurityGroups/myNSG"
  },
  "resourceGroup": "myResourceGroup",
  "resourceId": "/subscriptions/e09ba5dc-dac9-4055-b444-6048786ca668/resourceGroups/myResourceGroup/providers/Microsoft.Network/networkInterfaces/myNIC",
  "resourceType": "Microsoft.Network/networkInterfaces",
  "tags": null,
  "type": "Microsoft.Network/networkInterfaces"
}
}
PS D:\internship-celebal\week1\celebal-intern>
```

Step 6: Create the Virtual Machine

"Finally, I'll create a Linux virtual machine and attach the NIC to it. I'll also define a username and generate SSH keys."

```
az vm create --resource-group myResourceGroup --name myVM --nics myNIC --image UbuntuLTS --admin-username azureuser --generate-ssh-keys
```

I can create new vm using above command but I am using previously built vm here

- `az vm list --output table` (to see the list of vm)
- `az vm show --name ubuntu --resource-group AZURELINUX_GROUP --show-details --query publicips --output tsv` (to see the ip address you can see it on portal also)

Step 7: Connect to the VM

- `ssh -i "C:\Users\kriti\OneDrive\Documents\SSH\ubuntu_key.pem" azureuser@20.255.57.172` (for this you should have ssh file)

Terminal after successful SSH connection into Ubuntu VM (Welcome to Ubuntu message)

```
PS D:\> ssh -i "C:\Users\kriti\OneDrive\Documents\SSH\ubuntu_key.pem" azureuser@20.255.57.172
Welcome to Ubuntu 24.04.2 LTS (GNU/Linux 6.11.0-1015-azure x86_64)

 * Documentation: https://help.ubuntu.com
 * Management: https://landscape.canonical.com
 * Support: https://ubuntu.com/pro

System information as of Sat Jun 21 08:04:48 UTC 2025

System load: 0.0          Processes:      111
Usage of /: 6.5% of 28.02GB Users logged in: 0
Memory usage: 37%          IPv4 address for eth0: 10.0.0.4
Swap usage: 0%

* Strictly confined Kubernetes makes edge and IoT secure. Learn how MicroK8s
just raised the bar for easy, resilient and secure K8s cluster deployment.

https://ubuntu.com/engage/secure-kubernetes-at-the-edge

1 device has a firmware upgrade available.
Run `fwupdmgr get-upgrades` for more information.

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

1 device has a firmware upgrade available.
Run `fwupdmgr get-upgrades` for more information.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

azureuser@ubuntu:~$ []
```

4: Create and Assign a Policy at Subscription Level

Goal:

- **Create a built-in policy (e.g., "Allowed Locations")**

- Assign it at the subscription level to restrict resource creation to Central India

◆ Step 1: List All Built-in Policies

```
az policy definition list --query "[?contains(displayName, 'Allowed locations')].{Name:displayName, ID:id}" --output table
```

Show the list with the "Allowed locations" policy ID

```
PS D:\internship-celebal\week1\celebal-intern> az policy definition list --query "[?contains(displayName, 'Allowed locations')].{Name:displayName, ID:id}" --output table
Name
ID
-----
Allowed locations           /providers/Microsoft.Authorization/policyDefinitions/e56962a6-4747-49cd-b67b-bf8b01975c4c
Allowed locations for resource groups /providers/Microsoft.Authorization/policyDefinitions/e765b5de-1225-4ba3-bd56-1ac6695af988
```

◆ Step 2: Assign the Policy

```
az policy assignment create \
--name "AllowOnlyCentralIndia" \
--display-name "Only Central India Allowed" \
--scope /subscriptions/<subscription-id> \
--policy <policy-definition-id> \
--params '{"listOfAllowedLocations": {"value": ["centralindia"]}}'
```

Replace:

- <subscription-id> with your actual subscription ID
- <policy-definition-id> with the built-in policy ID you copied above

Policy assignment success JSON output

```
The provided JSON string may have been parsed by the shell. See https://learn.microsoft.com/cli/azure/use-azure-cli-successfully-quoting#json-strings
PowerShell requires additional quoting rules. See https://github.com/Azure/azure-cli/blob/dev/doc/quoting-issues-with-powershell.md
PS D:\internship-celebal\week1\celebal-intern> az policy assignment create \
>>   --name "AllowOnlyCentralIndia" \
>>   --display-name "Only Central India Allowed" \
>>   --scope "/subscriptions/e09ba5dc-dac9-4055-b444-6048786ca660" \
>>   --policy "e56962a6-4747-49cd-b67b-bf8b01975c4c" \
>>   --params '{"listOfAllowedLocations": {"value": ["centralindia"]}}'
Readonly attribute scope will be ignored in class <class 'azure.mgmt.resource.policy.v2021_06_01.models._models_py3.PolicyAssignment'>
{
    "description": null,
    "displayName": "Only Central India Allowed",
    "enforcementMode": "Default",
    "id": "/subscriptions/e09ba5dc-dac9-4055-b444-6048786ca660/providers/Microsoft.Authorization/policyAssignments/AllowOnlyCentralIndia",
    "identity": null,
    "location": null,
    "metadata": {
        "createdBy": "956cc40c-bd7b-4697-9e44-f7aca2d3c523",
        "createdOn": "2025-06-21T08:32:28.8301246Z",
        "updatedBy": null,
        "updatedOn": null
    },
    "name": "AllowOnlyCentralIndia",
    "nonComplianceMessages": null,
    "notScopes": null,
    "parameters": {
        "listOfAllowedLocations": {
            "value": [
                "centralindia"
            ]
        }
    },
    "policyDefinitionId": "/providers/Microsoft.Authorization/policyDefinitions/e56962a6-4747-49cd-b67b-bf8b01975c4c",
    "scope": "/subscriptions/e09ba5dc-dac9-4055-b444-6048786ca660",
    "systemData": {
        "createdAt": "2025-06-21T08:32:28.795190+00:00",
        "createdBy": "kriti.12217521@lpu.in",
        "createdByType": "User",
        "lastModifiedAt": "2025-06-21T08:32:28.795190+00:00",
        "lastModifiedBy": "kriti.12217521@lpu.in",
        "lastModifiedByType": "User"
    },
    "type": "Microsoft.Authorization/policyAssignments"
}
PS D:\internship-celebal\week1\celebal-intern>
```

◆ Step 3: Test It

Try to create a resource in East US from the portal or CLI — it should fail due to the policy.

Error message in portal or CLI (e.g., "disallowed by policy")

Create Web App

5. Azure Key Vault: Create, Store Secret, Configure Access, Retrieve via CLI

Variables

```
kvName="MyKeyVault"  
secretName="MySecret"
```

```
secretValue="MySecretValue"
```

```
PS D:\internship-celebal\week1\celebal-intern> $kvName="kritiVault987"
>> $secretName="DbPassword"
>> $secretValue="MyStrongPassword@123"
```

Create Key Vault

```
az keyvault create --name $kvName --resource-group $resourceGroup --location
$location
```

Add Secret

```
az keyvault secret set --vault-name $kvName --name $secretName --value
$secretValue
```

Set Policy to allow current user to get secrets

```
az keyvault set-policy --name $kvName --secret-permissions get list --object-id
$(az ad signed-in-user show --query objectId -o tsv)
```

Retrieve the secret

```
az keyvault secret show --vault-name $kvName --name $secretName --query value
-o tsv
```

```

EXPLORER PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

PS D:\internship-celebal\week1\celebal-intern> az provider show --namespace Microsoft.KeyVault --query "registrationState"
"Registered"

PS D:\internship-celebal\week1\celebal-intern> az keyvault create --name $kvName --resource-group MyResourceGroup --location centralindia
{
  "id": "/subscriptions/e09ba5dc-dac9-4055-b444-6048786ca660/resourceGroups/MyResourceGroup/providers/Microsoft.KeyVault/vaults/kritivault987",
  "location": "centralindia",
  "name": "kritivault987",
  "properties": {
    "accessPolicies": [],
    "createMode": null,
    "enablePurgeProtection": null,
    "enableRbacAuthorization": true,
    "enableSoftDelete": true,
    "enabledForDeployment": false,
    "enabledForDiskEncryption": null,
    "enabledForTemplateDeployment": null,
    "hasPoolResourceId": null,
    "networkAcls": null,
    "privateEndpointConnections": null,
    "provisioningState": "Succeeded",
    "publicNetworkAccess": "Enabled",
    "sku": {
      "family": "A",
      "name": "standard"
    },
    "softDeleteRetentionInDays": 90,
    "tenantId": "e14e73eb-5251-4388-8d67-8f9f2e2d5a46",
    "vaultUri": "https://kritivault987.vault.azure.net/"
  },
  "resourceGroup": "MyResourceGroup",
  "systemData": {
    "createdAt": "2025-06-23T03:37:10.684000+00:00",
    "createdBy": "kriti.1221752@lpu.in",
    "createdByType": "User",
    "lastModifiedAt": "2025-06-23T03:37:10.684000+00:00",
    "lastModifiedBy": "kriti.1221752@lpu.in",
    "lastModifiedByType": "User"
  },
  "tags": {},
  "type": "Microsoft.KeyVault/vaults"
}
④ PS D:\internship-celebal\week1\celebal-intern> az keyvault secret set --vault-name $kvName --name $secretName --value $secretValue
(FORBIDDEN) Caller is not authorized to perform action on resource.
If role assignments, deny assignments or role definitions were changed recently, please observe propagation time.
Caller: apid-04b07795-8dd6-461a-bbee-02f9e1bf7b46;oid=956cc40c-bd7b-4697-9e44-f7aca2d3c523;iss=https://sts.windows.net/e14e73eb-5251-4388-8d67-8f9f2e2d5a46/
Action: 'Microsoft.KeyVault/vaults/secrets/setSecret/action'
Resource: '/subscriptions/e09ba5dc-dac9-4055-b444-6048786ca660/resourcegroups/myresourcegroup/providers/microsoft.keyvault/vaults/kritivault987/secrets/dbpassword'
Assignment: (not found)
DenyAssignmentId: null
DecisionReason: null
Vault: kritivault987;location=centralindia

Code: Forbidden
Message: Caller is not authorized to perform action on resource.
If role assignments, deny assignments or role definitions were changed recently, please observe propagation time.
Caller: apid-04b07795-8dd6-461a-bbee-02f9e1bf7b46;oid=956cc40c-bd7b-4697-9e44-f7aca2d3c523;iss=https://sts.windows.net/e14e73eb-5251-4388-8d67-8f9f2e2d5a46/
Action: 'Microsoft.KeyVault/vaults/secrets/setSecret/action'
Resource: '/subscriptions/e09ba5dc-dac9-4055-b444-6048786ca660/resourcegroups/myresourcegroup/providers/microsoft.keyvault/vaults/kritivault987/secrets/dbpassword'
Assignment: (not found)
DenyAssignmentId: null
DecisionReason: null
Vault: kritivault987;location=centralindia

Inner error:
  "code": "ForbiddenByRbac"

```

6. Create VM using PowerShell

Login

Connect-AzAccount

Variables

```
$rg = "MyResourceGroup"
$location = "EastUS"
$vmName = "MyVM"
```

Create resource group

New-AzResourceGroup -Name \$rg -Location \$location

Create credentials

\$cred = Get-Credential

Create VM

New-AzVm -ResourceGroupName \$rg -Name \$vmName -Location \$location -Credential \$cred -Image "Win2019Datacenter"

7A. Schedule Daily VM Backup at 3 AM + CPU Alert

1. Create Recovery Services Vault

```
az backup vault create \
--resource-group $resourceGroup \
--name "MyBackupVault" \
--location $location
```

2. Register VM and Enable Backup

Register the VM

```
az backup protection enable-for-vm \
--resource-group $resourceGroup \
--vault-name "MyBackupVault" \
--vm "$vmName" \
--policy-name "DefaultPolicy"
```

3. Create Alert Rule for CPU > 80%

```
az monitor metrics alert create \
--name "HighCPUAlert" \
--resource-group $resourceGroup \
--scopes $(az vm show -g $resourceGroup -n $vmName --query id -o tsv) \
--condition "avg Percentage CPU > 80" \
--description "CPU usage above 80%" \
--action email --email-addresses your-email@example.com
```

7B. Provision Backups via Backup Center + Configure Retention

1. Backup Center Registration (CLI)

```
az backup protection enable-for-vm \
--resource-group $resourceGroup \
--vault-name "MyBackupVault" \
--vm $vmName \
--policy-name "DefaultPolicy"
```

2. Create Custom Backup Policy

```
az backup policy create \
--resource-group $resourceGroup \
--vault-name "MyBackupVault" \
--name "DailyPolicy" \
--policy
```

```
"{\\"schedulePolicy\\":{\\"schedulePolicyType\\":\\"SimpleSchedulePolicy\\",\\"schedul
```

```
eRunFrequency\" : "Daily", "scheduleRunTimes": [\"03:00\"], "retentionPolicy": {  
    "retentionPolicyType": "SimpleRetentionPolicy", "dailySchedule": {  
        "retentionTimes": [\"03:00\"], "retentionDuration": {"count": 30, "durationType": "Days"}  
    }  
}
```