Lab 09c- Implement Azure Kubernetes Service

Objectives

In this lab, you will:

- Task 1: Register the Microsoft.Kubernetes and Microsoft.KubernetesConfiguration resource providers.
- Task 2: Deploy an Azure Kubernetes Service cluster
- Task 3: Deploy pods into the Azure Kubernetes Service cluster
- Task 4: Scale containerized workloads in the Azure Kubernetes service cluster

Task 4: Scale containerized workloads in the Azure Kubernetes service cluster

In this task, we will scale horizontally the number of pods and then number of cluster nodes.

1. Command: kubectl scale --replicas=2 deployment/nginx-deployment
   Output:

```
ana [ ~ ]$  kubectl scale --replicas=2 deployment/nginx-deployment
deployment.apps/nginx-deployment scaled
ana [ ~ ]$ 
```

2. Command: kubectl get pods
   Output:

```
ana [ ~ ]$ kubectl get pods
NAME                                READY    STATUS     RESTARTS    AGE
nginx-deployment-85c6d5f6dd-r9tdm   1/1      Running    0           2m3s
nginx-deployment-85c6d5f6dd-v8n8z   1/1      Running    0           5m42s
ana [ ~ ]$ 
```

3. Command:
   RESOURCE_GROUP='az104-09c-rg1'
   AKS_CLUSTER='az104-9c-aks1'
   az aks scale --resource-group $RESOURCE_GROUP --name $AKS_CLUSTER --node-count
   2
   Output:

```
ana [ ~ ]$ RESOURCE_GROUP='az104-09c-rg1'
ana [ ~ ]$  AKS_CLUSTER='az104-9c-aks1'
ana [ ~ ]$  az aks scale --resource-group $RESOURCE_GROUP --name $AKS_CLUSTER --node-count 2
{
  "aadProfile": null,
  "addonProfiles": {
    "azureKeyvaultSecretsProvider": {
      "config": null,
      "enabled": false,
      "identity": null
    },
    "azurepolicy": {
      "config": null,
      "enabled": false,
      "identity": null
    },
    "omsAgent": {
      "config": {
        "logAnalyticsWorkspaceResourceID": "/subscriptions/9947c7d8-0002-4f95-9be2-e61cef4a15b3/
resourceGroups/DefaultResourceGroup-EUS/providers/Microsoft.OperationalInsights/workspaces/Defau
ltWorkspace-9947c7d8-0002-4f95-9be2-e61cef4a15b3-EUS"
      },
      "enabled": true,
      "identity": {
        "clientId": "8fe8f15f-2ee5-408e-9f40-39ba5a6e8e39",
        "objectId": "2a2447b0-9c5a-4b6b-9fea-115629ef0074",
        "resourceId": "/subscriptions/9947c7d8-0002-4f95-9be2-e61cef4a15b3/resourcegroups/MC_az1
04-09c-rg1_az104-9c-aks1_eastus/providers/Microsoft.ManagedIdentity/userAssignedIdentities/omsag
ent-az104-9c-aks1"
      }
    }
  },
```

```
"agentPoolProfiles": [
  {
    "availabilityZones": null,
    "count": 2,
    "creationData": null,
    "currentOrchestratorVersion": "1.24.10",
    "enableAutoScaling": false,
    "enableEncryptionAtHost": null,
    "enableFips": false,
    "enableNodePublicIp": false,
    "enableUltraSsd": null,
    "gpuInstanceProfile": null,
    "hostGroupId": null,
    "kubeletConfig": null,
    "kubeletDiskType": "OS",
    "linuxOsConfig": null,
    "maxCount": null,
    "maxPods": 110,
    "minCount": null,
    "mode": "System",
    "name": "agentpool",
    "nodeImageVersion": "AKSUbuntu-1804gen2containerd-202303.22.0",
    "nodeLabels": null,
    "nodePublicIpPrefixId": null,
    "nodeTaints": null,
    "orchestratorVersion": "1.24.10",
    "osDiskSizeGb": 128,
    "osDiskType": "Managed",
    "osSku": "Ubuntu",
    "osType": "Linux",
    "podSubnetId": null,
    "powerState": {
      "code": "Running"
```

```json
      "code": "Running"
    },
    "provisioningState": "Succeeded",
    "proximityPlacementGroupId": null,
    "scaleDownMode": null,
    "scaleSetEvictionPolicy": null,
    "scaleSetPriority": null,
    "spotMaxPrice": null,
    "tags": null,
    "type": "VirtualMachineScaleSets",
    "upgradeSettings": null,
    "vmSize": "Standard_DS2_v2",
    "vnetSubnetId": null,
    "workloadRuntime": null
  }
],
"apiServerAccessProfile": null,
"autoScalerProfile": null,
"autoUpgradeProfile": {
  "upgradeChannel": "patch"
},
"azureMonitorProfile": null,
"azurePortalFqdn": "az104-9c-aks1-dns-tlvadm1b.portal.hcp.eastus.azmk8s.io",
"currentKubernetesVersion": "1.24.10",
"disableLocalAccounts": false,
"diskEncryptionSetId": null,
"dnsPrefix": "az104-9c-aks1-dns",
"enablePodSecurityPolicy": null,
"enableRbac": true,
"extendedLocation": null,
"fqdn": "az104-9c-aks1-dns-tlvadm1b.hcp.eastus.azmk8s.io",
"fqdnSubdomain": null,
"httpProxyConfig": null,
```

```json
  "fqdnSubdomain": null,
  "httpProxyConfig": null,
  "id": "/subscriptions/9947c7d8-0002-4f95-9be2-e61cef4a15b3/resourcegroups/az104-09c-rg1/providers/Microsoft.ContainerService/managedClusters/az104-9c-aks1",
  "identity": {
    "principalId": "d846d778-0634-42e2-8866-b998ee5865b4",
    "tenantId": "3e612f7c-4e11-4f7f-baa8-480bead007da",
    "type": "SystemAssigned",
    "userAssignedIdentities": null
  },
  "identityProfile": {
    "kubeletidentity": {
      "clientId": "95d8fb9d-263a-498c-9abd-3c80eca6312b",
      "objectId": "c55b0acd-56b3-4318-a9c0-caa266b2b1d6",
      "resourceId": "/subscriptions/9947c7d8-0002-4f95-9be2-e61cef4a15b3/resourcegroups/MC_az104-09c-rg1_az104-9c-aks1_eastus/providers/Microsoft.ManagedIdentity/userAssignedIdentities/az104-9c-aks1-agentpool"
    }
  },
  "kubernetesVersion": "1.24.10",
  "linuxProfile": null,
  "location": "eastus",
  "maxAgentPools": 100,
  "name": "az104-9c-aks1",
  "networkProfile": {
    "dnsServiceIp": "10.0.0.10",
    "dockerBridgeCidr": "172.17.0.1/16",
    "ipFamilies": [
      "IPv4"
    ],
    "loadBalancerProfile": {
      "allocatedOutboundPorts": null,
      "effectiveOutboundIPs": [
        {
```

```
    ],
    "loadBalancerProfile": {
      "allocatedOutboundPorts": null,
      "effectiveOutboundIPs": [
        {
          "id": "/subscriptions/9947c7d8-0002-4f95-9be2-e61cef4a15b3/resourceGroups/MC_az104-09c
-rg1_az104-9c-aks1_eastus/providers/Microsoft.Network/publicIPAddresses/1336415f-983f-4053-b592-
f20eda332342",
          "resourceGroup": "MC_az104-09c-rg1_az104-9c-aks1_eastus"
        }
      ],
      "enableMultipleStandardLoadBalancers": null,
      "idleTimeoutInMinutes": null,
      "managedOutboundIPs": {
        "count": 1,
        "countIpv6": null
      },
      "outboundIPs": null,
      "outboundIpPrefixes": null
    },
    "loadBalancerSku": "Standard",
    "natGatewayProfile": null,
    "networkDataplane": null,
    "networkMode": null,
    "networkPlugin": "kubenet",
    "networkPluginMode": null,
    "networkPolicy": null,
    "outboundType": "loadBalancer",
    "podCidr": "10.244.0.0/16",
    "podCidrs": [
      "10.244.0.0/16"
    ],
    "serviceCidr": "10.0.0.0/16",
    "serviceCidrs": [
```

```
    ],
    "serviceCidr": "10.0.0.0/16",
    "serviceCidrs": [
      "10.0.0.0/16"
    ]
  },
  "nodeResourceGroup": "MC_az104-09c-rg1_az104-9c-aks1_eastus",
  "oidcIssuerProfile": {
    "enabled": false,
    "issuerUrl": null
  },
  "podIdentityProfile": null,
  "powerState": {
    "code": "Running"
  },
  "privateFqdn": null,
  "privateLinkResources": null,
  "provisioningState": "Succeeded",
  "publicNetworkAccess": null,
  "resourceGroup": "az104-09c-rg1",
  "securityProfile": {
    "azureKeyVaultKms": null,
    "defender": null,
    "imageCleaner": null,
    "workloadIdentity": null
  },
  "servicePrincipalProfile": {
    "clientId": "msi",
    "secret": null
  },
  "sku": {
    "name": "Base",
    "tier": "Standard"
  },
```

```
    "sku": {
       "name": "Base",
       "tier": "Standard"
    },
    "storageProfile": {
       "blobCsiDriver": null,
       "diskCsiDriver": {
          "enabled": true
       },
       "fileCsiDriver": {
          "enabled": true
       },
       "snapshotController": {
          "enabled": true
       }
    },
    "systemData": null,
    "tags": null,
    "type": "Microsoft.ContainerService/ManagedClusters",
    "windowsProfile": null,
    "workloadAutoScalerProfile": {
       "keda": null
    }
}
ana [ ~ ]$ █
```

4. Command: kubectl get nodes
   Output:

```
ana [ ~ ]$ kubectl get nodes
NAME                                      STATUS   ROLES   AGE   VERSION
aks-agentpool-11865840-vmss000000         Ready    agent   27m   v1.24.10
aks-agentpool-11865840-vmss000001         Ready    agent   10m   v1.24.10
ana [ ~ ]$ █
```

5. Command: kubectl scale --replicas=10 deployment/nginx-deployment
   Output:

```
ana [ ~ ]$  kubectl scale --replicas=10 deployment/nginx-deployment
deployment.apps/nginx-deployment scaled
ana [ ~ ]$
```

6. Command: kubectl get pods
   Output:

```
ana [ ~ ]$  kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
nginx-deployment-85c6d5f6dd-bnvfl   1/1     Running   0          31s
nginx-deployment-85c6d5f6dd-cszjb   1/1     Running   0          31s
nginx-deployment-85c6d5f6dd-jdm59   1/1     Running   0          31s
nginx-deployment-85c6d5f6dd-k4q59   1/1     Running   0          31s
nginx-deployment-85c6d5f6dd-lbcqd   1/1     Running   0          31s
nginx-deployment-85c6d5f6dd-r9tdm   1/1     Running   0          19m
nginx-deployment-85c6d5f6dd-rwg8z   1/1     Running   0          31s
nginx-deployment-85c6d5f6dd-s8r64   1/1     Running   0          31s
nginx-deployment-85c6d5f6dd-v8n8z   1/1     Running   0          23m
nginx-deployment-85c6d5f6dd-xrx2c   1/1     Running   0          31s
ana [ ~ ]$
```

7. Command: kubectl get pod -o=custom-columns=NODE:.spec.nodeName,POD:.metadata.name
   Output:

```
ana [ ~ ]$  kubectl get pod -o=custom-columns=NODE:.spec.nodeName,POD:.metadata.name
NODE                                POD
aks-agentpool-11865840-vmss000001   nginx-deployment-85c6d5f6dd-bnvfl
aks-agentpool-11865840-vmss000000   nginx-deployment-85c6d5f6dd-cszjb
aks-agentpool-11865840-vmss000000   nginx-deployment-85c6d5f6dd-jdm59
aks-agentpool-11865840-vmss000001   nginx-deployment-85c6d5f6dd-k4q59
aks-agentpool-11865840-vmss000001   nginx-deployment-85c6d5f6dd-lbcqd
aks-agentpool-11865840-vmss000000   nginx-deployment-85c6d5f6dd-r9tdm
aks-agentpool-11865840-vmss000001   nginx-deployment-85c6d5f6dd-rwg8z
aks-agentpool-11865840-vmss000000   nginx-deployment-85c6d5f6dd-s8r64
aks-agentpool-11865840-vmss000000   nginx-deployment-85c6d5f6dd-v8n8z
aks-agentpool-11865840-vmss000001   nginx-deployment-85c6d5f6dd-xrx2c
ana [ ~ ]$
```

8. Command: kubectl delete deployment nginx-deployment
   Output:

```
ana [ ~ ]$  kubectl delete deployment nginx-deployment
deployment.apps "nginx-deployment" deleted
ana [ ~ ]$ 
```