

Lesson 08 Demo 01

Creating a Kubernetes Cluster Using AKS

Objective: To create a Kubernetes cluster using Azure Kubernetes Services (AKS)

Tools required: Azure management tools

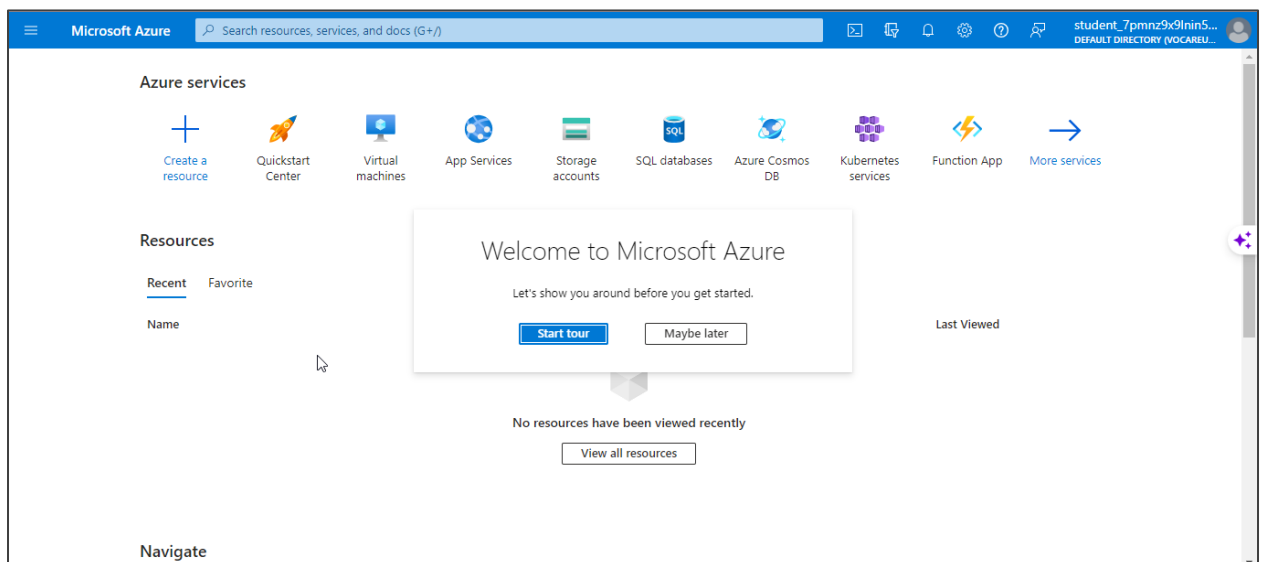
Prerequisites: None

Steps to be followed:

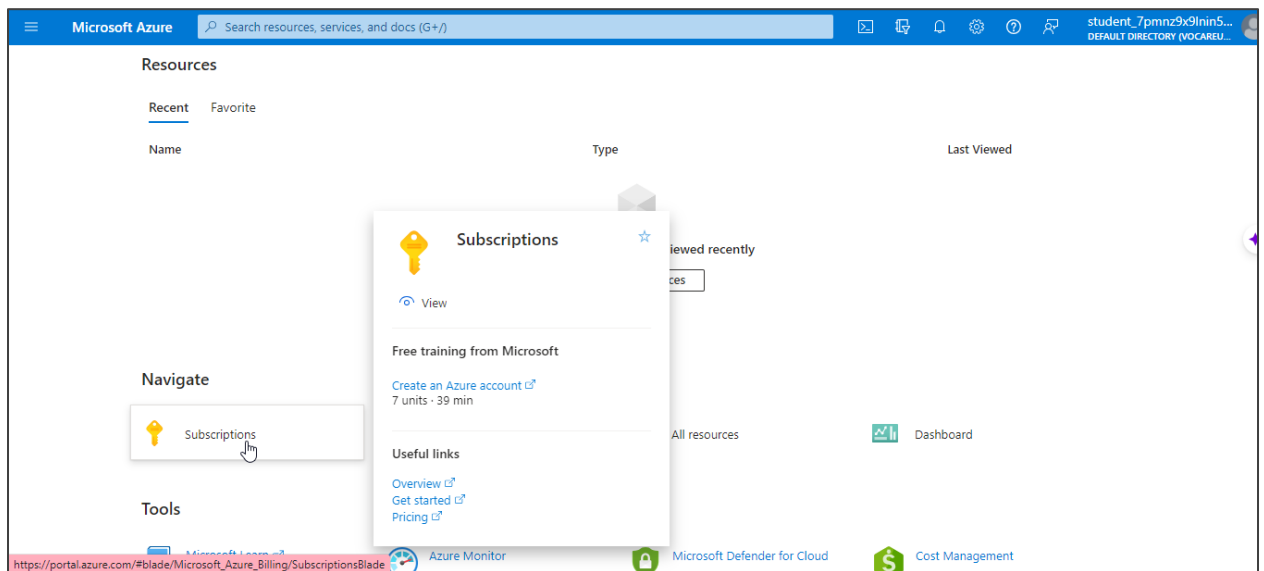
1. Set up the prerequisites for configuring an AKS cluster
2. Create a Kubernetes cluster using the AKS service

Step 1: Set up the prerequisites for configuring an AKS cluster

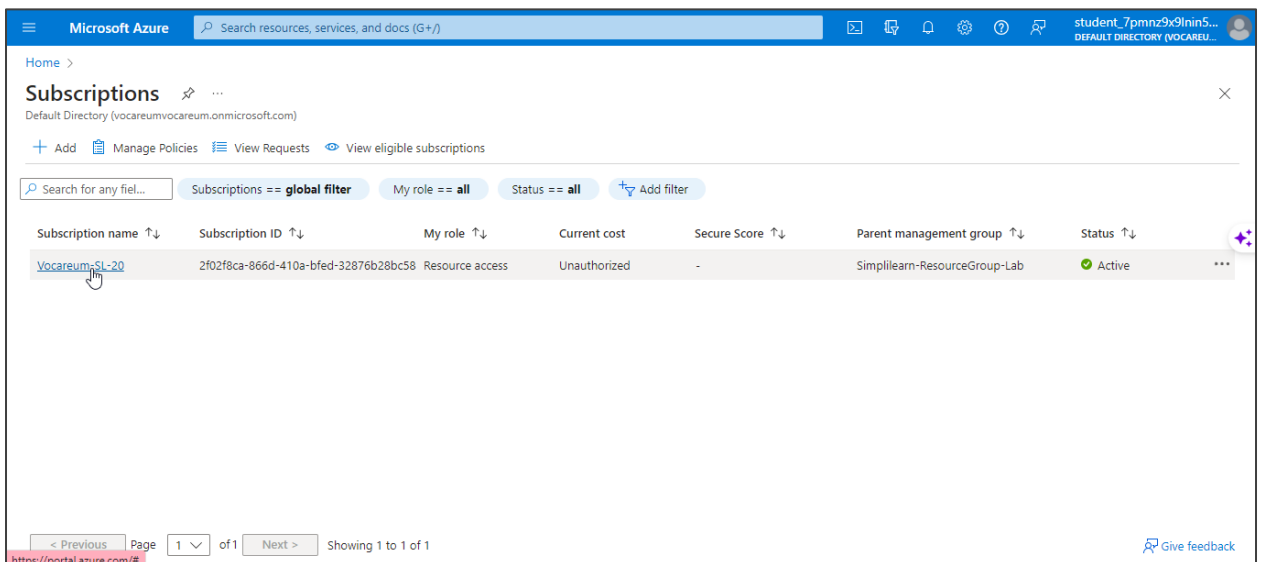
1.1 Sign in to the Microsoft Azure portal using the given lab credentials



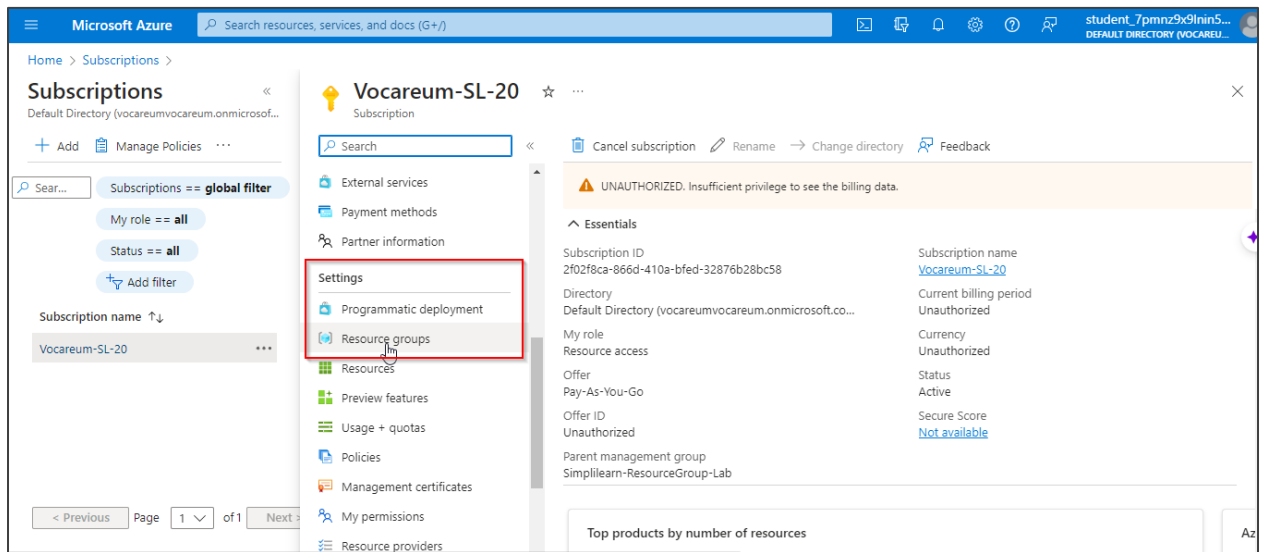
1.2 Click on the **Subscriptions** tab under the **Navigate** section



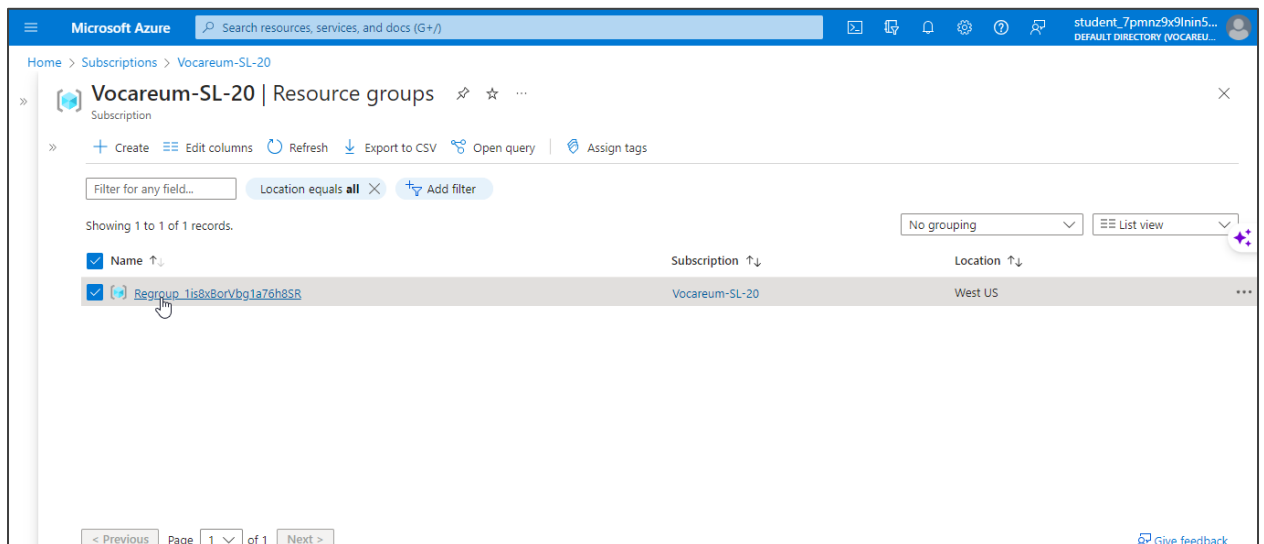
1.3 On the **Subscriptions** page, click on **Vocareum-SL-20** under the **Subscription name**



1.4 Inside the **Vocareum-SL-20** subscription, click on the **Resource groups** under **Settings**

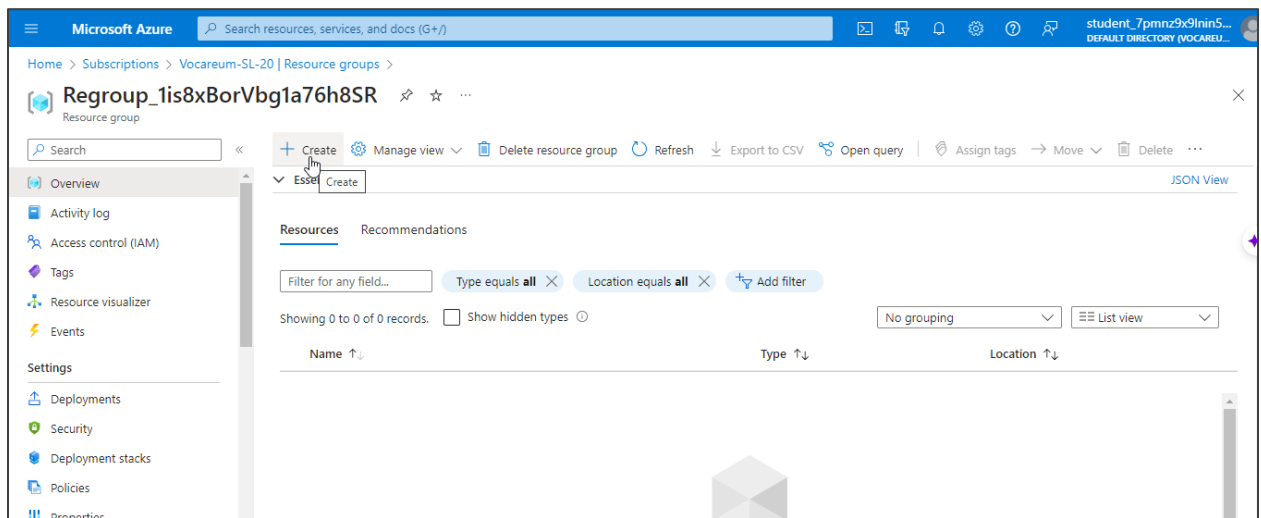


1.5 On the **Resource groups** page, click on the specified resource group to access it

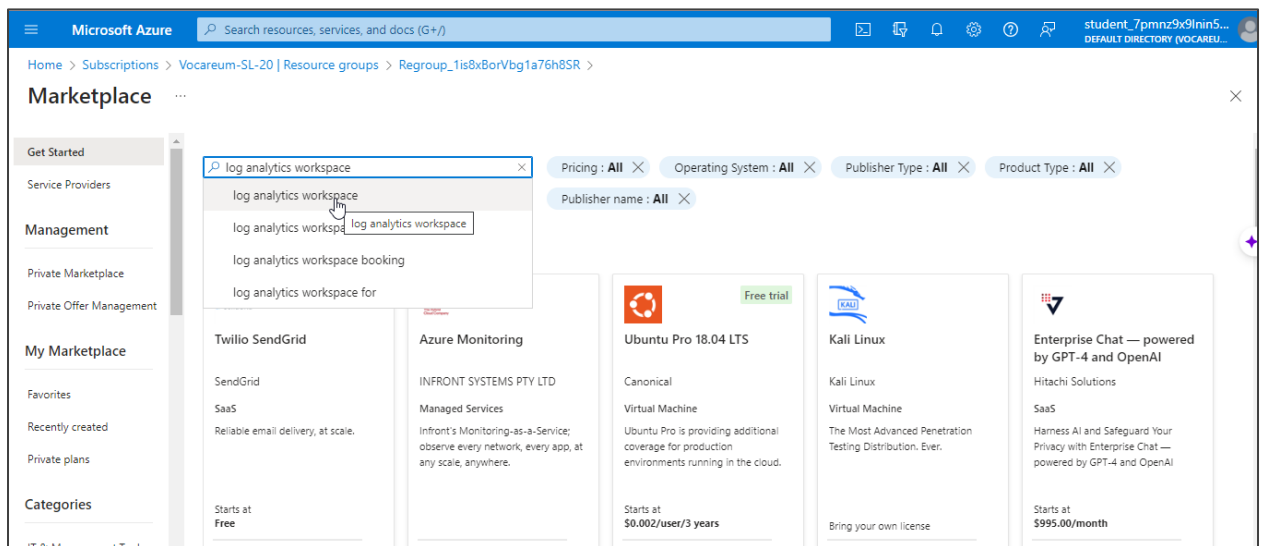


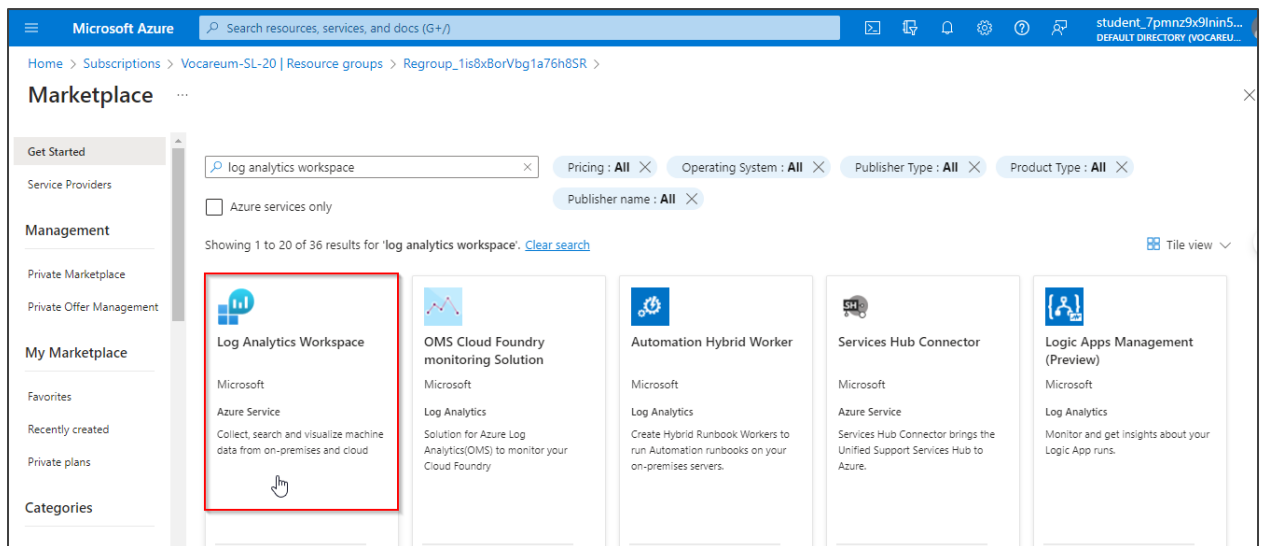
Note: The resource group name will be different for everyone, but the subscription name will be **Vocareum-SL-20**.

1.6 On the overview page, click on the **Create** button

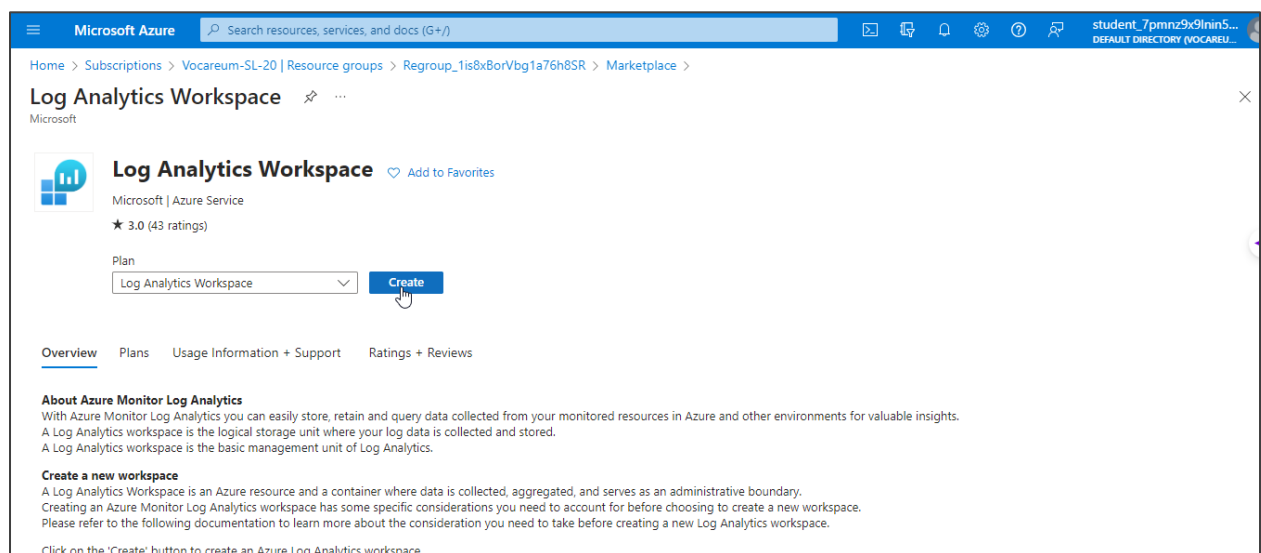


1.7 On the Marketplace page, search for **log analytics workspace** and select the **Log Analytics Workspace** environment





1.8 On the **Log Analytics Workspace** page, click on the **Create** button to configure a workspace



1.9 On the **Create Log Analytics Workspace** page, enter the following details, and click on the **Review + Create** button:

- **Name: ClusterLogAnalytics**
- **Region: West US**

Microsoft Azure

Home > Subscriptions > Vocareum-SL-20 | Resource groups > Regroup_1is8xBorVbg1a76h8SR > Marketplace > Log Analytics Workspace >

Create Log Analytics workspace

With Azure Monitor Logs you can easily store, retain, and query data collected from your monitored resources in Azure and other environments for valuable insights. A Log Analytics workspace is the logical storage unit where your log data is collected and stored.

Project details
Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription *

Resource group * [Create new](#)

Instance details

Name * ✓

Region *

[Review + Create](#) [Previous](#) [Next: Tags >](#)

Note: Keep the default value for other fields.

1.10 Once the validation is complete, click on the **Create** button

Microsoft Azure

Home > Subscriptions > Subscriptions > Vocareum-SL-20 | Resource groups > Regroup_3bEd3lWtg1HdiU2Y8j > Marketplace > Log Analytics Workspace >

Create Log Analytics workspace

✓ Validation passed

Basics Tags **Review + Create**

Log Analytics workspace
by Microsoft

Basics

Subscription Vocareum-SL-20

Resource group Regroup_3bEd3lWtg1HdiU2Y8j

Name ClusterLogAnalytics

Region West US

Pricing

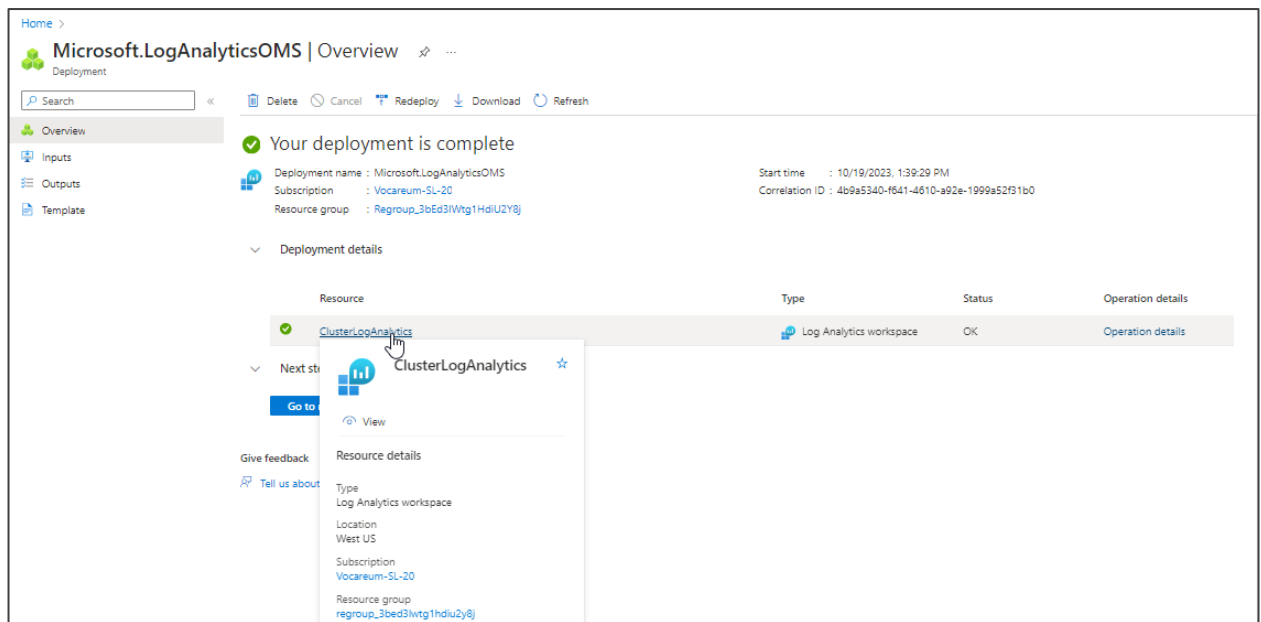
Pricing tier Pay-as-you-go (Per GB 2018)

The cost of your workspace depends on the volume of data ingested and how long it is retained. Regional pricing details are available on the [Azure Monitor pricing page](#). You can change to a different pricing tier after the workspace is created. [Learn more about Log Analytics pricing models.](#)

Tags

None

[Create](#) [Previous](#) [Download a template for automation](#)

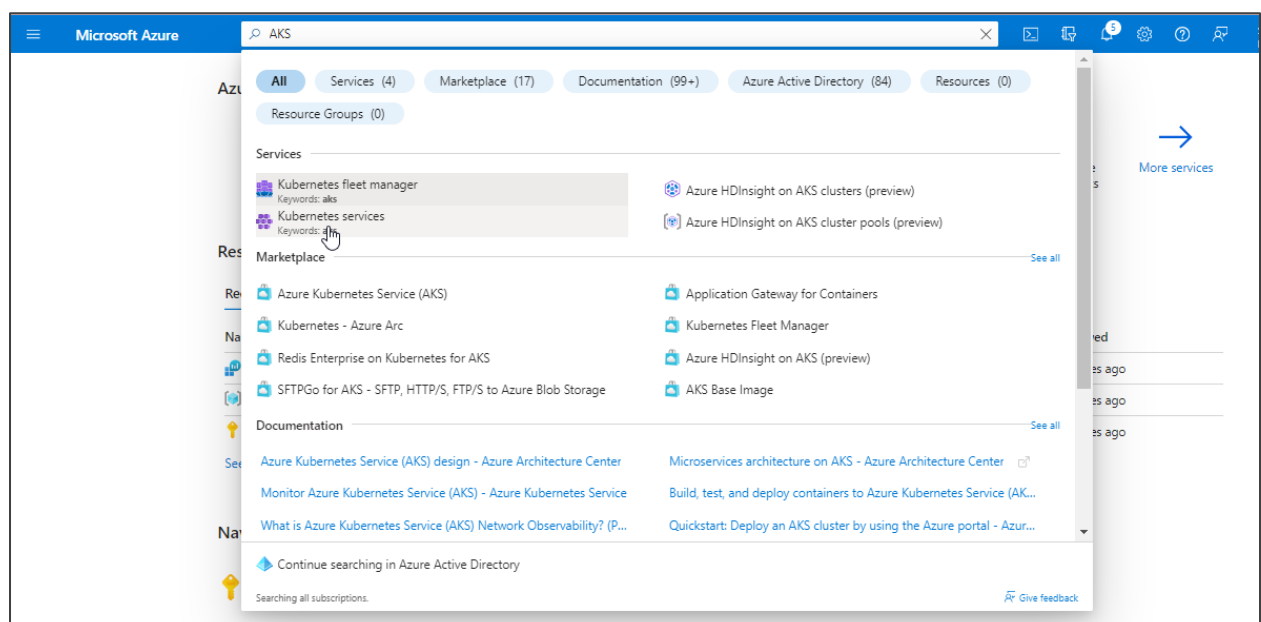


The **ClusterLogAnalytics** resource group is successfully deployed.

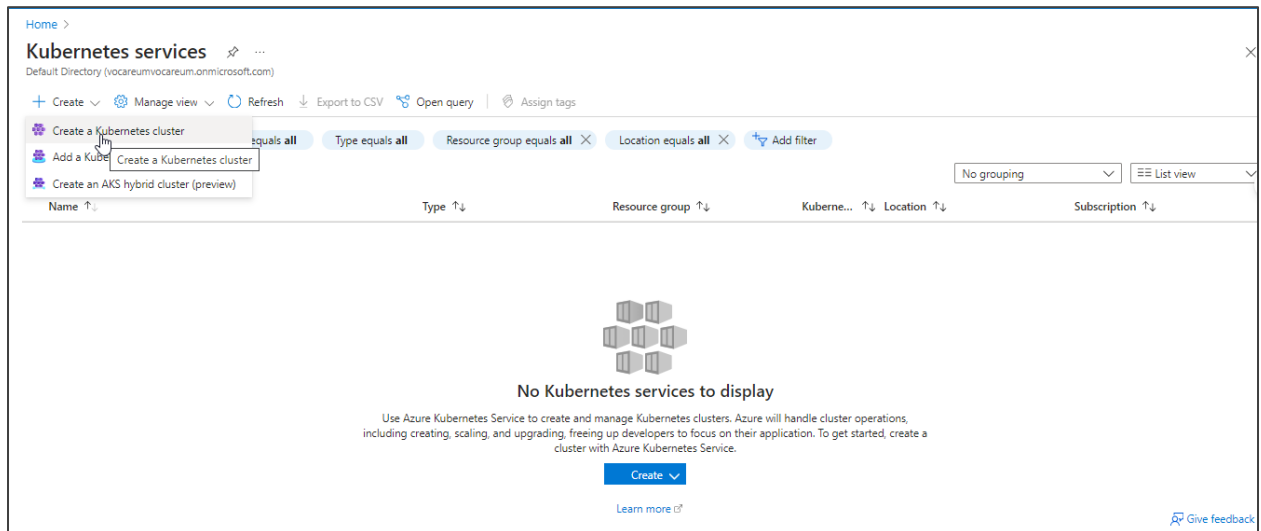
Note: The deployment process might take some time.

Step 2: Create a Kubernetes cluster using the AKS service

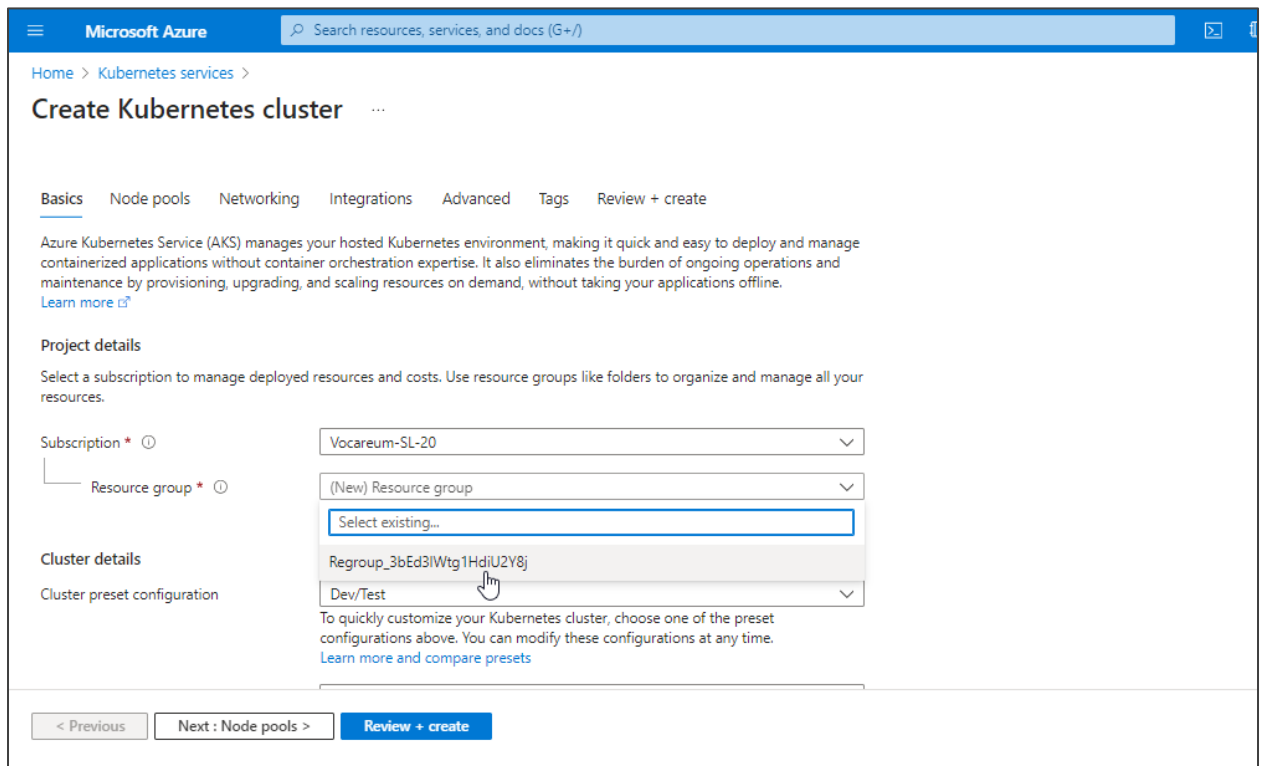
2.1 In the Home page, search for AKS and select Kubernetes services



2.2 Click on **Create > Create a Kubernetes cluster**



2.3 Under the **Basics** tab, select the default unique resource group as per the subscription of the respective Azure account



2.4 Under **Cluster details**, enter the following details, and click on **Next: Node pools**:

- **Cluster preset configuration: Production Standard or Dev/Test**
- **Kubernetes cluster name: SL-Cluster**
- **Region: (US) East US 2**
- **Availability zones: None**
- **AKS pricing tier: Standard**
- **Kubernetes version: 1.27.3 (or the latest stable version)**
- **Automatic upgrade: Disabled**

Microsoft Azure

Home > Kubernetes services >

Create Kubernetes cluster

Cluster details

Cluster preset configuration: Dev/Test

Kubernetes cluster name *: SL-Cluster

Region *: (US) East US 2

Availability zones: None

AKS pricing tier: Standard

Kubernetes version *: 1.27.3

Automatic upgrade: Disabled

Choose between local accounts or Azure AD for authentication and Azure RBAC or Kubernetes RBAC for your authorization needs.

Authentication and Authorization: Local accounts with Kubernetes RBAC

Once the cluster is deployed, use the Kubernetes CLI to manage RBAC configurations. [Learn more](#)

< Previous **Next : Node pools** Review + create

Next : Node pools >

2.5 Configure the **Node pools** as per the screenshot below, and click on **Next: Networking**

Microsoft Azure

Search resources, services, and docs (G+/I)

[Home](#) > [Kubernetes services](#) >

Create Kubernetes cluster

[Basics](#)
[Node pools](#)
[Networking](#)
[Integrations](#)
[Advanced](#)
[Tags](#)
[Review + create](#)

Node pools

In addition to the required primary node pool configured on the Basics tab, you can also add optional node pools to handle a variety of workloads. [Learn more about node pools](#)

[+ Add node pool](#)
[Delete](#)

Name	Mode	Node size	OS SKU	Node count
agentpool	System	Standard_D8ds_v5 (change)	Ubuntu	2 - 5
userpool	User	Standard_D8ds_v5 (change)	Ubuntu	2 - 100

Enable virtual nodes

Virtual nodes allow burstable scaling backed by serverless Azure Container Instances. [Learn more about virtual nodes](#)

Enable virtual nodes ☐

Node pool OS disk encryption

By default, all disks in AKS are encrypted at rest with Microsoft-managed keys. For additional control over encryption, you can supply your own keys using a disk encryption set backed by an Azure Key Vault. The disk encryption set will be used to encrypt the OS disks for all node pools in the cluster. [Learn more](#)

Encryption type
 (Default) Encryption at-rest with a platform-managed key

< Previous

Next: Networking >

Review + create

Next: Networking >

2.6 Under the **Networking** tab, select **kubenet** as the Network configuration and **None** as the Network policy; then click on **Next: Integrations**

Microsoft Azure

Home > Kubernetes services >

Create Kubernetes cluster

Basics Node pools **Networking** Integrations Advanced Tags Review + create

Azure provides various networking controls to help manage and secure access to your Kubernetes cluster.

Private access

Enable a private cluster to restrict worker node to API access, enhancing your Kubernetes workload's security and isolation.

Enable private cluster ☐

Public access

Set authorized IP ranges ☐

Container networking

Network configuration ☒ **kubenet**
Best for smaller node pools. Each pod is assigned a logically different IP address from the subnet for simpler setup

☐ Azure CNI
Best for larger node pools. Each node and pod is assigned a unique IP for advanced configurations

Bring your own virtual network ☒

Virtual network * [Create new](#)

Cluster subnet *

Kubernetes service address range *

Kubernetes DNS service IP address *

DNS name prefix *

Network policy ☒ **None**
Allow all ingress and egress traffic to the pods

☐ Calico
Open-source networking solution. Best for large-scale deployments with strict security requirements

☐ Azure
Native networking solution. Best for simpler deployments with basic security and networking requirements

i The Azure network policy is not compatible with kubenet networking.

Load balancer

< Previous Next: Integrations > Review + create

Note: Retain all the default configurations

2.7 Under the **Integrations** tab, choose **Custom configuration**, and enable the container logs with **ClusterLogAnalytics** resource group as the **Log Analytics workspace**

Microsoft Azure

Home > Kubernetes services >

Create Kubernetes cluster

✓ Your subscription is protected by Microsoft Defender for Cloud basic plan.

Azure Container Registry
Connect your cluster to an Azure Container Registry to enable seamless deployments from a private image registry.
[Learn more about Azure Container Registry](#)

Container registry: None
[Create new](#)

Azure Monitor
In addition to the CPU and memory metrics included in AKS by default, you can enable Container Insights for more comprehensive data on the overall performance and health of your cluster. Billing is based on data ingestion and retention settings.
[Learn more about container performance and health monitoring](#)
[Learn more about pricing](#)

☐ Default configuration
☒ **Custom configuration**
☐ Off

Container Insights

Enable Container Logs: ☒

Log Analytics workspace: ClusterLogAnalytics
[Create new](#)

Use managed identity: ☐

2.8 Uncheck the Prometheus and Grafana metrics, and click on **Review + create**

Managed Prometheus
Managed Prometheus provides a highly available, scalable, and secure metrics platform to monitor your containerized workloads. [Learn more](#)

Enable Prometheus metrics: ☐

Managed Grafana
Selecting a fully managed instance of Grafana to visualize your managed Prometheus data stored in your Azure Monitor workspace. [Learn more about pricing](#)

Enable Grafana: ☐

Alerting

Enable recommended alert rules: ☒

Alert rules

Alert me if

- CPU Usage Percentage is greater than 95%
- Memory Working Set Percentage is greater than 100%

Notify me by

- Email: student_7pmnz9x9lin5im5_00460266@vocareumvocareum.onmicrosoft.com

Azure Policy
Apply at-scale enforcements and safeguards for AKS clusters in a centralized, consistent manner through Azure Policy.
[Learn more about Azure Policy for AKS](#)

Azure Policy: ☒ Enabled ☐ Disabled

[< Previous](#)
[Next : Advanced >](#)
[Review + create](#)

2.9 Once the validation is passed, click on **Create**

Microsoft Azure

Home > Kubernetes services >

Create Kubernetes cluster

Validation passed

Basics Node pools Networking Integrations Advanced Tags Review + create

Basics

Subscription: Vocareum-SL-20
 Resource group: Regroup_3bEd3IWtg1HdIU2Y8j
 Region: East US 2
 Kubernetes cluster name: SL-Cluster
 Kubernetes version: 1.26.6
 Automatic upgrade: Disabled

Node pools

Node pools: 1
 Enable virtual nodes: Disabled

Access

Resource identity: System-assigned managed identity
 Local accounts: Enabled
 Authentication and Authorization: Local accounts with Kubernetes RBAC

< Previous Next > **Create** Download a template for automation

Note: If the validation fails, try selecting a different region for the cluster under the **Basics** tab. Consider the following regions: Central US, West US, and East US.

Home >

microsoft.aks-20231019135506 | Overview

Deployment

Search

Delete Cancel Redeploy Download Refresh

Overview Inputs Outputs Template

Your deployment is complete

Deployment name: microsoft.aks-20231019135506 Start time: 10/19/2023, 2:44:35 PM
 Subscription: Vocareum-SL-20 Correlation ID: 16a8546c-56d5-4da8-98ac-3770a7d3df24
 Resource group: Regroup_3bEd3IWtg1HdIU2Y8j

Deployment details

Resource	Type	Status	Operation details
InsightsMetricAlertsDepl-10eaeffe-667c	Microsoft.Resources/deployments	OK	Operation details
ClusterSubnetRoleAssignmentDeploymen	Microsoft.Resources/deployments	OK	Operation details
SL-Cluster	Microsoft.ContainerService/managedCI...	OK	Operation details
SL-Cluster	Microsoft.ContainerService/managedCI...	OK	Operation details
VnetDeployment-10eaeffe-667c-44ff-8d6	Microsoft.Resources/deployments	OK	Operation details

Next steps

Create a quick start application Recommended
 Create a Kubernetes deployment Recommended
 Integrate automatic deployments within your cluster Recommended
 Connect to cluster Recommended

Go to resource Connect to cluster

The **SL-Cluster** is successfully deployed.

2.10 Click on **Node pools** under **Settings** to verify the number of nodes in the cluster

The screenshot shows the 'Node pools' page for the 'SL-Cluster' in the Microsoft Azure portal. The left sidebar has a red box around the 'Node pools' link under the 'Settings' section. The main content area shows a table with one node pool named 'agentpool'.

Node pool	Provisioning state	Power state	Scale method	Target nodes	Ready nodes	Autoscaling status	Mode	Kubernetes version	Node size
agentpool	Succeeded	Running	Autoscale	2	2	-	System	1.28.6	Standard_DS2_v2

By following these steps, you have successfully configured Kubernetes cluster using AKS.