😊 LAB: AZURE KUBERNETES

"Azure Kubernetes" typically refers to the Azure Kubernetes Service (AKS), which is a managed container orchestration service provided by Microsoft Azure. Kubernetes is an open-source container orchestration platform, and AKS is Microsoft's solution for deploying and managing containerized applications using Kubernetes on the Azure cloud platform.

Azure Kubernetes Service simplifies the deployment, scaling, and management of containerized applications by handling the underlying infrastructure and Kubernetes orchestration. Users can easily create and manage Kubernetes clusters without the need to manually configure and maintain the underlying infrastructure.

Some key features of Azure Kubernetes Service include:

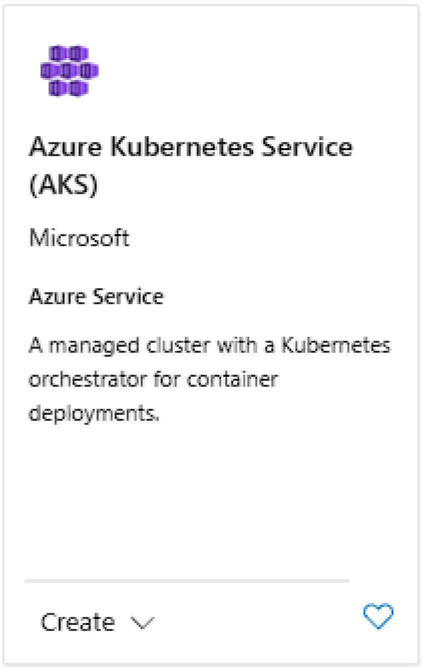
1. **Managed Clusters:** AKS takes care of the deployment and management of Kubernetes clusters, including automatic upgrades, patching, and scaling.
2. **Integration with Azure Services:** AKS seamlessly integrates with other Azure services, making it easier to build and deploy applications that leverage Azure's ecosystem.
3. **Monitoring and Diagnostics:** AKS integrates with Azure Monitor, providing monitoring and diagnostics capabilities to ensure the health and performance of your applications.
4. **Security:** AKS includes features for securing containerized applications, including Azure Active Directory integration and role-based access control (RBAC).

Overall, Azure Kubernetes Service is designed to provide a streamlined experience for developers and operators looking to leverage Kubernetes for deploying and managing containerized applications in the Azure cloud environment.

😁 TO BEGIN WITH THE LAB:

STEP 1: DEPLOYE KUBERNETES

1. On the Azure Portal search for Azure Kubernetes Service.
2. Open and create your service.

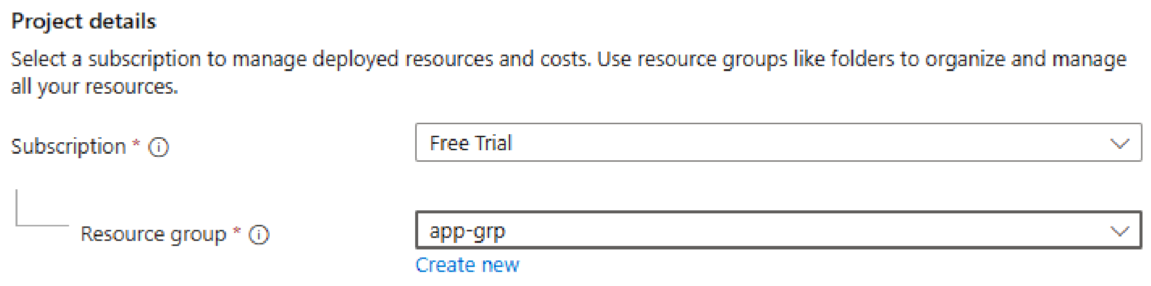

Azure Kubernetes Service (AKS)

Microsoft

Azure Service

A managed cluster with a Kubernetes orchestrator for container deployments.

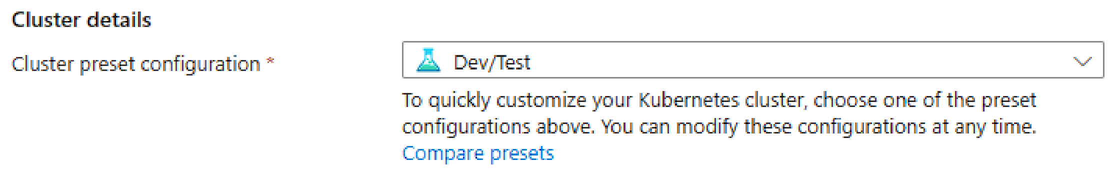
3. First choose your resource group.


Project details

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

Subscription *	Free Trial
Resource group *	app-grp

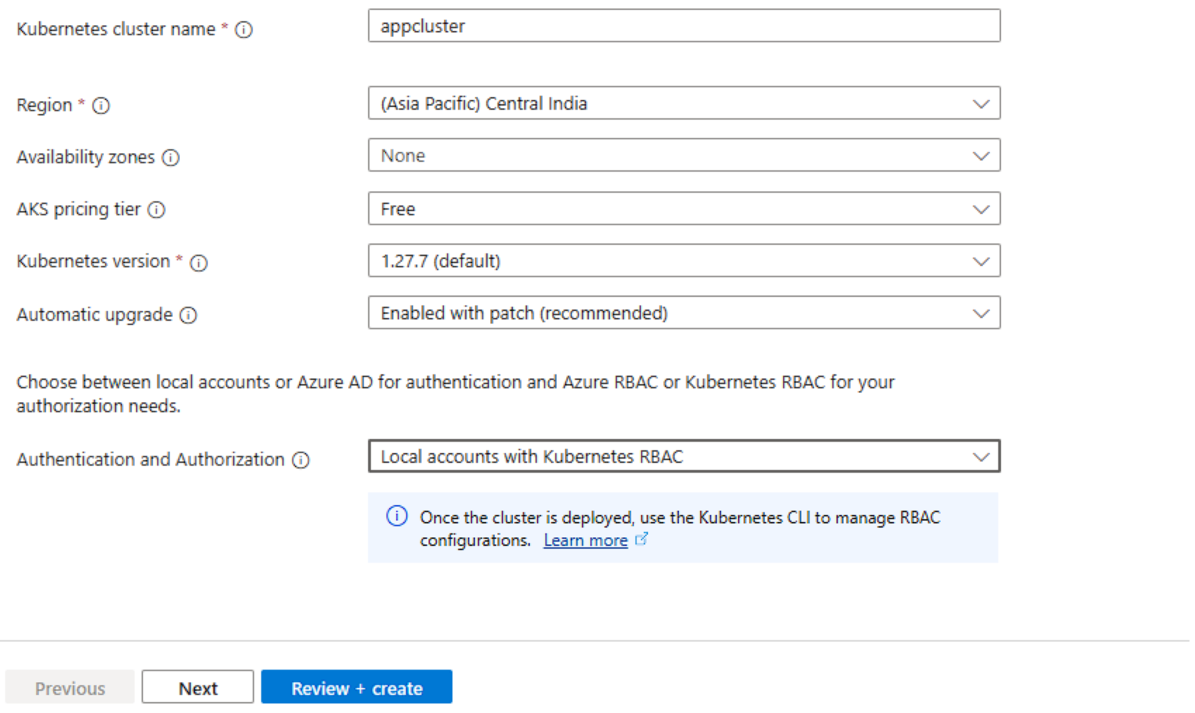
4. In the cluster details choose dev/test.


Cluster details

Cluster preset configuration *	Dev/Test

To quickly customize your Kubernetes cluster, choose one of the preset configurations above. You can modify these configurations at any time.

5. Now give it a name and choose the other options as shown below. Then move to next page.


Kubernetes cluster name * ⓘ: appcluster

Region * ⓘ: (Asia Pacific) Central India

Availability zones ⓘ: None

AKS pricing tier ⓘ: Free

Kubernetes version * ⓘ: 1.27.7 (default)

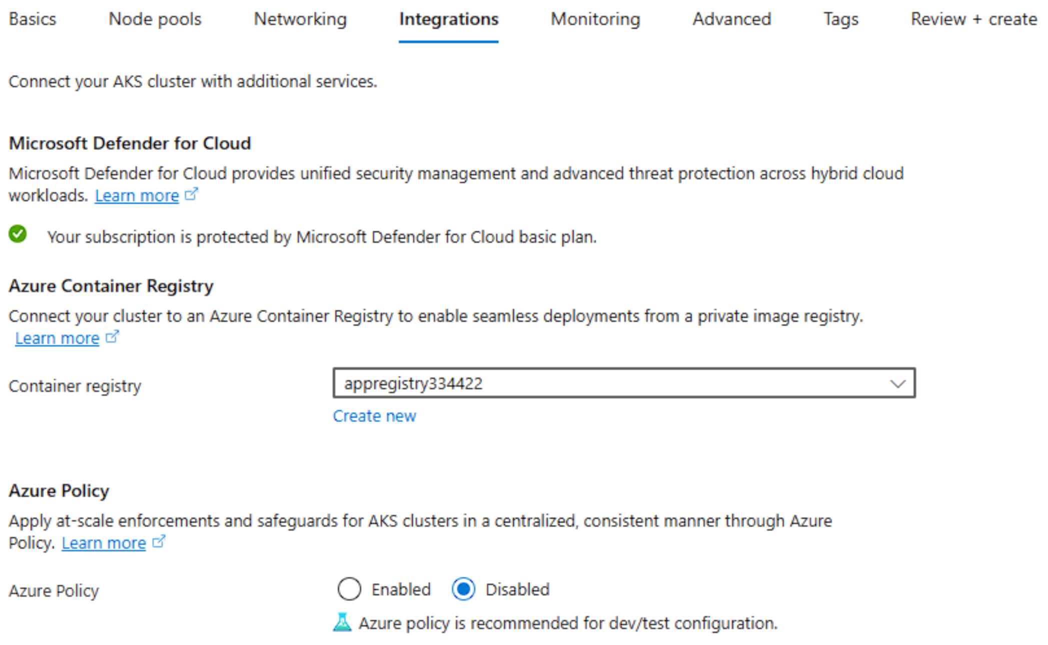
Automatic upgrade ⓘ: Enabled with patch (recommended)

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

6. In integration option you can select your container registry, which you created before and use it here.
7. Now jump to review page and create your Kubernetes service.



Connect your AKS cluster with additional services.

Microsoft Defender for Cloud

Microsoft Defender for Cloud provides unified security management and advanced threat protection across hybrid cloud workloads. Learn more

✓ 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

Container registry: appregistry334422

Create new

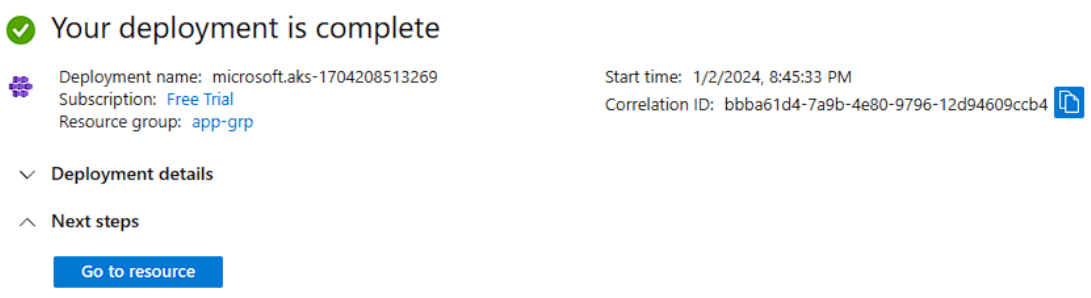
Azure Policy

Apply at-scale enforcements and safeguards for AKS clusters in a centralized, consistent manner through Azure Policy. Learn more

Azure Policy: Enabled [✓ Disabled]

Azure policy is recommended for dev/test configuration.

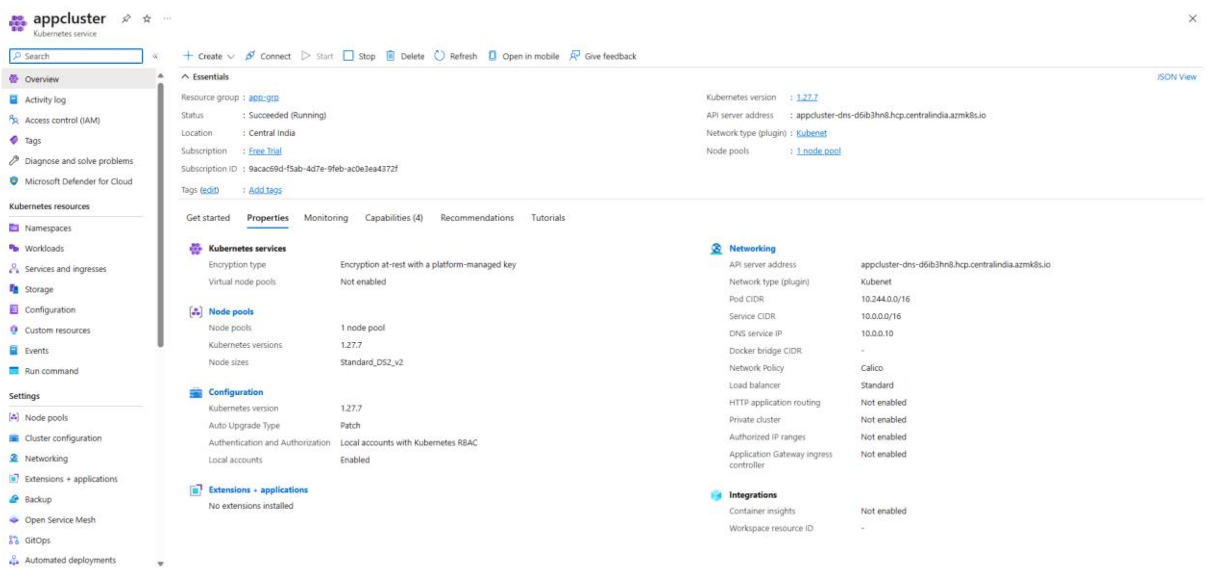
8. Once it is deployed go to resources.


Your deployment is complete

Deployment name: microsoft.aks-1704208513269
Subscription: Free Trial
Resource group: app-grp

Start time: 1/2/2024, 8:45:33 PM
Correlation ID: bbba61d4-7a9b-4e80-9796-12d94609ccb4

9. This is your app cluster.



Essentials

Resource group	: app-grp
Status	: Succeeded (Running)
Location	: Central India
Subscription	: Free Trial
Subscription ID	: 9acac69d-f5ab-4d7e-9feb-ac0e3ea4372f
Tags (edit)	: Add tags
Kubernetes version	: 1.27.7
API server address	: appcluster-dns-d6ib3hn8.hcp.centralindia.azmk8s.io
Network type (plugin)	: Kubenet
Node pools	: 1 node pool

Kubernetes services

Encryption type	Encryption at-rest with a platform-managed key
Virtual node pools	Not enabled

Node pools

Node pools	1 node pool
Kubernetes versions	1.27.7
Node sizes	Standard_DS2_v2

Configuration

Kubernetes version	1.27.7
Auto Upgrade Type	Patch
Authentication and Authorization	Local accounts with Kubernetes RBAC
Local accounts	Enabled

Extensions + applications

No extensions installed

Networking

API server address	appcluster-dns-d6ib3hn8.hcp.centralindia.azmk8s.io
Network type (plugin)	Kubenet
Pod CIDR	10.244.0.0/16
Service CIDR	10.0.0.0/16
DNS service IP	10.0.0.10
Docker bridge CIDR	-
Network Policy	Calico
Load balancer	Standard
HTTP application routing	Not enabled
Private cluster	Not enabled
Authorized IP ranges	Not enabled
Application Gateway ingress controller	Not enabled

Integrations

Container insights	Not enabled
Workspace resource ID	-

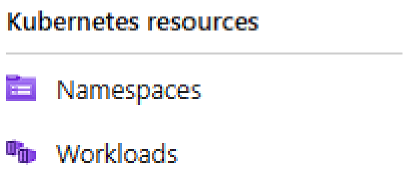
10. If you want to now deploy your application, your container, you can make use of the image that is available as part of your Azure Container registry.
11. We configured that this cluster will have the ability to interact, basically authenticate with your Azure container registry.
12. All we need to do now is to go on to workloads based in a YAML definition which will tell this cluster.
13. Please go ahead and pick up the image from our container registry and run it has a container.
14. We don't go again into the details of this deployment YAML file here.
15. We are just telling the service. Please go ahead and take the image that you have in your Azure container registry and deploy it has a container.
16. We even have a service YAML file which allows us to use a load balancer within the Azure service.
17. This load balancer will allow traffic to reach the application that's running in the container via port APIs.
18. So, while the use of this load balancer, I should be able to send a request onto my application running in the container.
19. **You can get these files from GitHub or you can copy the code and create a .yaml file.**
    Below is the file for deployment

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: sqlapp-deployment
  labels:
    app: sqlapp
spec:
  replicas: 1
  selector:
    matchLabels:
      app: sqlapp
  template:
    metadata:
      labels:
        app: sqlapp
    spec:
      containers:
      - name: sqlapp
        image: appregistry10002313.azurecr.io/sqlapp:latest
        ports:
        - containerPort: 80
```

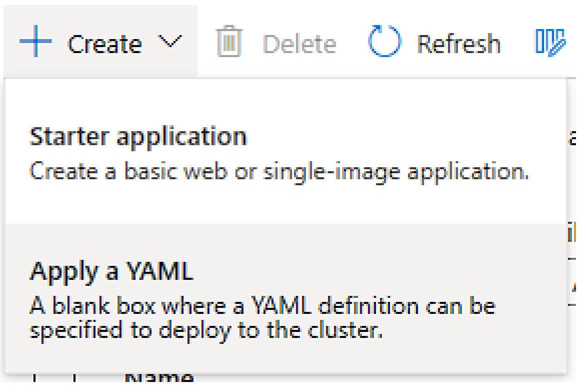
Below is the file for service.

```
apiVersion: v1
kind: Service
metadata:
  name: sql-service
spec:
  type: LoadBalancer
  ports:
  - port: 80
  selector:
    app: sqlapp
```

20. So, to apply these yaml file is pretty easy. Just go to workloads under Kubernetes resources.



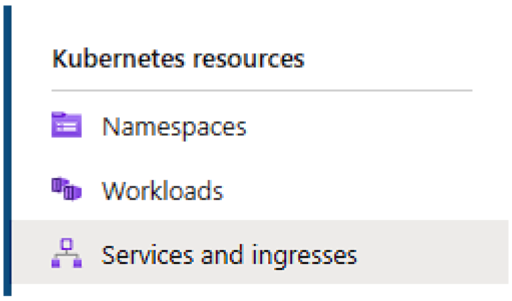
21. Then click on create, now click on apply a YAML



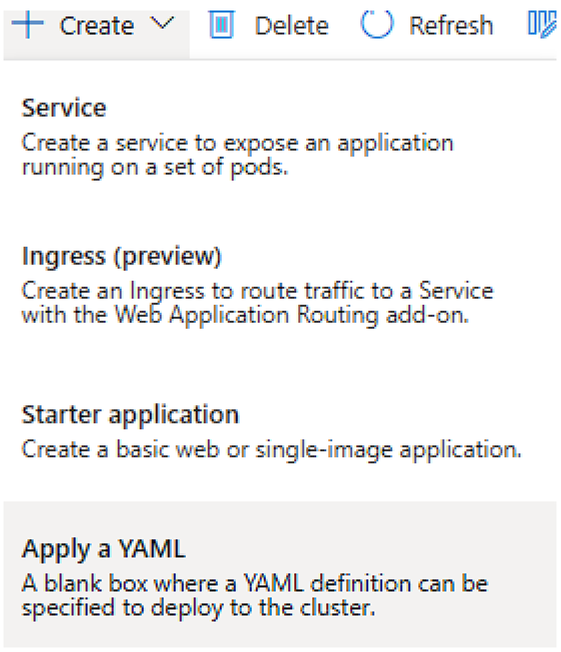
Starter application
Create a basic web or single-image application.

Apply a YAML
A blank box where a YAML definition can be specified to deploy to the cluster.

22. Now copy the deployment code and paste it there.
23. Similarly, for services go to services and ingresses under Kubernetes resources.



24. Then again click on create, apply a YAML.



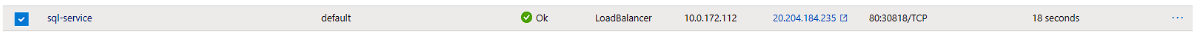
Service
Create a service to expose an application running on a set of pods.

Ingress (preview)
Create an Ingress to route traffic to a Service with the Web Application Routing add-on.

Starter application
Create a basic web or single-image application.

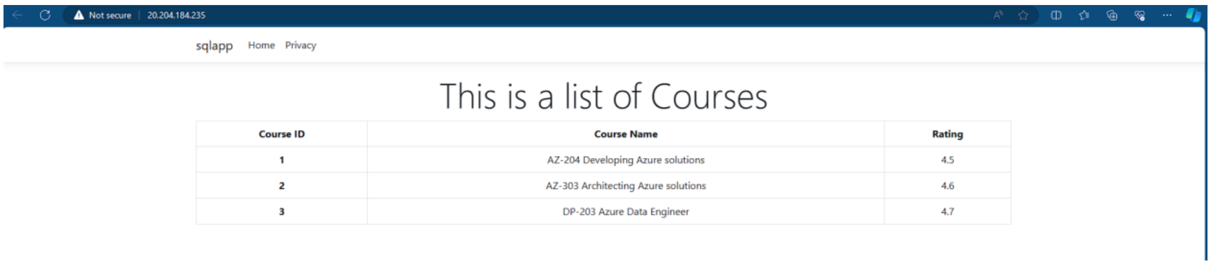
Apply a YAML
A blank box where a YAML definition can be specified to deploy to the cluster.

25. Once you have created both the YAML, and they are in working state.
26. If you go to services then you will see that it has assigned an IP.



✓	sql-service	default	✓ Ok	LoadBalancer	10.0.172.112	20.204.184.235	80:30818/TCP	18 seconds

27. And if you will open this IP in a new tab then you can see your application.



This is a list of Courses

Course ID	Course Name	Rating
1	AZ-204 Developing Azure solutions	4.5
2	AZ-303 Architecting Azure solutions	4.6
3	DP-203 Azure Data Engineer	4.7