

Deployment Steps

1. Prepare Project Structure

```
git clone <your-repo-url>
cd <project-directory>
```

2. Build Docker Images

```
docker build -t <acr-name>.azurecr.io/user-service:latest ./user-service
docker build -t <acr-name>.azurecr.io/order-service:latest ./order-service
docker build -t <acr-name>.azurecr.io/api-gateway:latest ./api-gateway
```

3. Login to Azure

```
az login
az account set --subscription <subscription-id>
```

4. Login to Azure Container Registry

```
az acr login --name <acr-name>
```

5. Push Docker Images

```
docker push <acr-name>.azurecr.io/user-service:latest
docker push <acr-name>.azurecr.io/order-service:latest
docker push <acr-name>.azurecr.io/api-gateway:latest
```

6. Create Resource Group

```
az group create --name <rg-name> --location <region>
```

7. Create AKS Cluster with ACR Integration

```
az aks create \
--resource-group <rg-name> \
--name <aks-cluster-name> \
--node-count 2 \
--enable-managed-identity \
--attach-acr <acr-name>
```

8. Connect to AKS Cluster

```
az aks get-credentials --resource-group <rg-name> --name <aks-cluster-name>
```

9. Create Namespace

```
kubectl create namespace <namespace>
```

10. Create ConfigMap

```
kubectl create configmap app-config \
--from-literal=USER_SERVICE_URL=http://user-service:5000 \
--from-literal=ORDER_SERVICE_URL=http://order-service:5001 \
-n <namespace>
```

11. Create Secrets

```
kubectl create secret generic app-secrets \
--from-literal=APPINSIGHTS_KEY=<instrumentation-key> \
-n <namespace>
```

12. Deploy Microservices

```
kubectl apply -f k8s/user-deployment.yaml -n <namespace>
kubectl apply -f k8s/order-deployment.yaml -n <namespace>
kubectl apply -f k8s/gateway-deployment.yaml -n <namespace>
```

13. Deploy Services

```
kubectl apply -f k8s/user-service.yaml -n <namespace>
kubectl apply -f k8s/order-service.yaml -n <namespace>
kubectl apply -f k8s/gateway-service.yaml -n <namespace>
```

14. Deploy Ingress Controller

```
kubectl apply -f k8s/ingress.yaml -n <namespace>
```

15. Verify Deployments

```
kubectl get all -n <namespace>
```

16. Scale Deployments

```
kubectl scale deployment user-service --replicas=2 -n <namespace>
kubectl scale deployment order-service --replicas=2 -n <namespace>
kubectl scale deployment api-gateway --replicas=2 -n <namespace>
```

17. Apply Autoscaling

```
kubectl apply -f k8s/hpa-user.yaml -n <namespace>
kubectl apply -f k8s/hpa-order.yaml -n <namespace>
```

18. Check Ingress IP

```
kubectl get ingress -n <namespace>
```

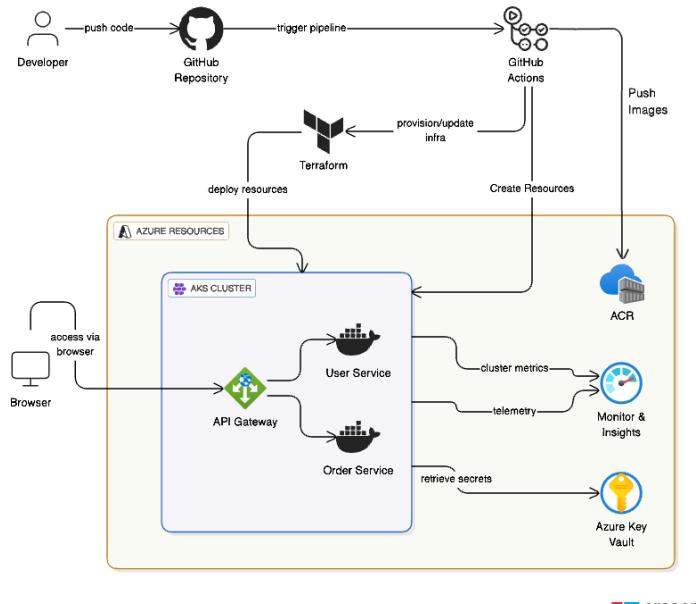
19. Test Application

```
curl http://<ingress-ip>/api/users
curl http://<ingress-ip>/api/orders
```

19. Bowser open/test Application

```
http://48.195.184.67/user/1
http://48.195.184.67/order/1
```

Screenshots



eraser

```

himanshu@Himanshus-MacBook-Pro-5 Azure-demo % docker build --platform linux/amd64 -t demoaksacr9nzhntn.azurecr.io/user:latest ./services/user
[+] Building 14.4s (10/10) FINISHED
--> [internal] load build definition from Dockerfile
--> transferring dockerfile: 240B
--> [internal] load metadata for docker.io/library/python:3.11-slim
--> [internal] load .dockerignore
--> => transferring context: 2B
--> sha256:2b63e76fde1e2003/1ed9f3ceey1161d19263bcff65c9ab60f63819819a74 0.0s
--> => resolve docker.io/library/python:3.11-slim@sha256:193fd0bbcb3d2ae612bd6cc3548d2f7c78d65b549fc当地8af75624c47474444d 0.0s
--> => sha256:b3dd773c329649f22e467ae3d1c612a39a559dec99fffb9ada94ab5c60c55 1.29MB / 1.29MB 0.0s
--> => sha256:b3dd773c329649f22e467ae3d1c612a39a559dec99fffb9ada94ab5c60c55 14.36MB / 14.36MB 2.5s
--> => sha256:c4110dd4d7ea9320db352f6516001262753529edf1e20b2c6607a6b9a49cc6be4 10.37KB / 10.37KB 0.0s
--> => sha256:c4110dd4d7ea9320db352f6516001262753529edf1e20b2c6607a6b9a49cc6be4 1.75KB / 1.75KB 0.0s
--> => sha256:408a88bf5bce9239b7e739e86384d26964d1d55ada56b9297a3d891e91634d 5.48KB / 5.48KB 0.0s
--> => sha256:9eabc2bd6656e6e080e3c749af79eae63ba0a488f2da 251B / 251B 3.8s
--> => extracting sha256:9eabc2bd6656e6e080e3c749af79eae63ba0a488f2da 0.6s
--> => extracting sha256:2b630e76fde1e208371ed9f3ceey1161d19263bcff65c9ab6b63819810a974 0.1s
--> => extracting sha256:b3dd773c329649f22e467ae3d1c612a039a0559dec99fffb9ada90ab5c60c55 0.4s
--> => extracting sha256:1771569cc1299abc9cc762fc4419523e721b11a3927ef968ae63ba0a488f2da 0.0s
--> [internal] load build context
--> => transferring context: 156B 0.0s
--> [2/5] WORKDIR /app 0.0s
--> [3/5] COPY requirements.txt .
--> [4/5] RUN pip install --no-cache-dir -r requirements.txt 5.4s
--> [5/5] COPY . .
--> => exporting to image 0.0s
--> => exporting layers 0.1s
--> => writing image sha256:7b15c16bf17916d5c2681f9885f95e2e5dfbfce2744fb3f9bd7955a218e3c8d 0.1s
--> => naming to demoaksacr9nzhntn.azurecr.io/user:latest 0.0s
View build details: docker-desktop://dashboard/build/desktop-linux/desktop-linux/hannndqyqo9ly1k29cfoweu40
What's next:
  View a summary of image vulnerabilities and recommendations → docker scout quickview

```



```

himanshu@Himanshus-MacBook-Pro-5 Azure-demo % docker push demoaksacr9nzhtn.azurecr.io/user:latest
The push refers to repository [demoaksacr9nzhtn.azurecr.io/user]
f3fc4ce4b6c: Layer already exists
3ec6d600b7ce3: Pushed
7553905eaac3: Pushed
d9fd2f5dda48: Pushed
720ee7aae3d: Pushed
655ff69eb9c8: Pushed
5c988ea8862: Pushed
70a290c5e58b: Pushed
latest: digest: sha256:1a1b11610f978db5418e075e4af32a7738a39055267f1c25eb68c2e741e70981 size: 1991
himanshu@Himanshus-MacBook-Pro-5 Azure-demo %
himanshu@Himanshus-MacBook-Pro-5 Azure-demo % docker push demoaksacr9nzhtn.azurecr.io/order:latest
The push refers to repository [demoaksacr9nzhtn.azurecr.io/order]
eea7428bd9d1: Pushed
b995d74ce37: Pushed
fe059c4ea1f2: Pushed
d9fd2f5dda48: Mounted from user
720ee7aae3d: Mounted from user
655ff69eb9c8: Mounted from user
5c988ea8862: Mounted from user
70a290c5e58b: Mounted from user
latest: digest: sha256:073e4908720eacbef6be64ea0c214e588cf253dd97bac7f92fef208c5e88e305 size: 1991
himanshu@Himanshus-MacBook-Pro-5 Azure-demo %
himanshu@Himanshus-MacBook-Pro-5 Azure-demo % docker push demoaksacr9nzhtn.azurecr.io/gateway:latest
The push refers to repository [demoaksacr9nzhtn.azurecr.io/gateway]
266b52bacf71: Pushed
b995d74ce37: Mounted from user
fe059c4ea1f2: Mounted from order
d9fd2f5dda48: Mounted from order
720ee7aae3d: Mounted from order
655ff69eb9c8: Mounted from order
5c988ea8862: Mounted from order
70a290c5e58b: Mounted from order
latest: digest: sha256:b6faebb215fe9b9472b4d34431121a29a3e75a4f21fd81988544705ace8bf4e6 size: 1991
himanshu@Himanshus-MacBook-Pro-5 Azure-demo %

```

```

himanshu@Himanshus-MacBook-Pro-5 Azure-demo % kubectl get all,secrets,cm -n demo
NAME          READY   STATUS    RESTARTS   AGE
pod/api-gateway-56d49b6fbf-ctvmt   1/1     Running   0          38s
pod/api-gateway-56d49b6fbf-xsp95   1/1     Running   0          53s
pod/order-service-648dcc9b-t626p   1/1     Running   0          52s
pod/order-service-648dcc9b-vmcxn   1/1     Running   0          38s
pod/user-service-58ab57dc9c-wv695  1/1     Running   0          38s
pod/user-service-58ab57dc9c-zvx44  1/1     Running   0          52s

NAME        TYPE      CLUSTER-IP   EXTERNAL-IP   PORT(S)   AGE
service/gateway-svc   ClusterIP  10.0.143.62 <none>        80/TCP   128m
service/order-svc    ClusterIP  10.0.33.176 <none>        80/TCP   134m
service/user-svc     ClusterIP  10.0.249.62 <none>        80/TCP   134m
|
NAME           READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/api-gateway   2/2     2           2           128m
deployment.apps/order-service  2/2     2           2           134m
deployment.apps/user-service   2/2     2           2           134m

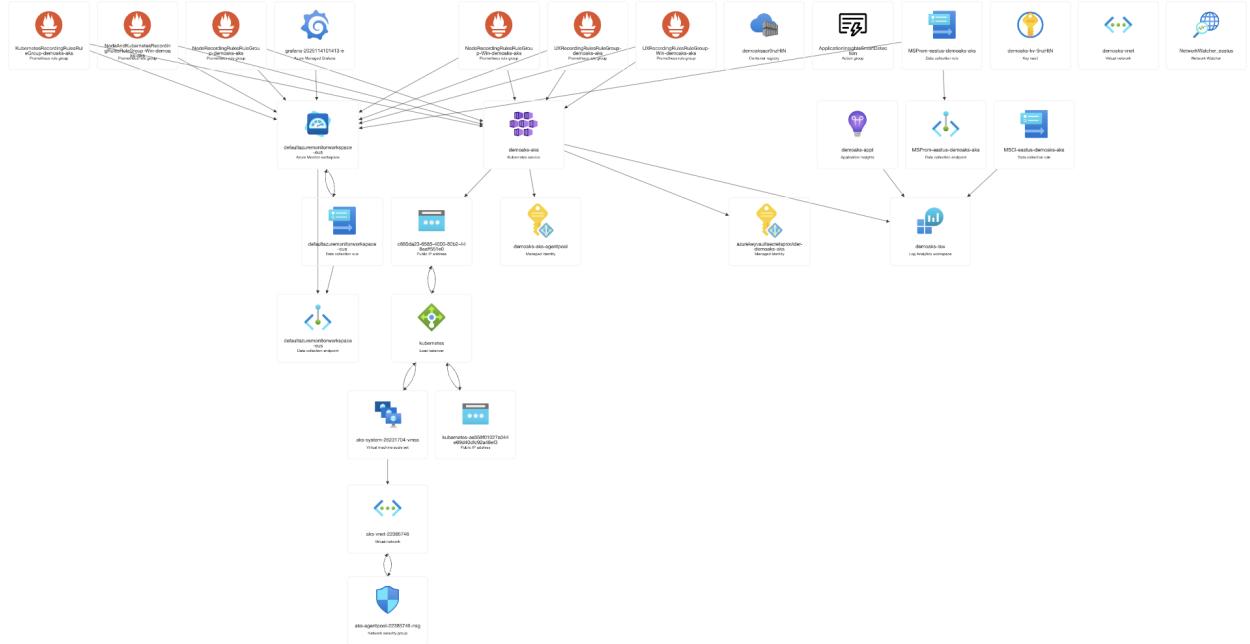
NAME           DESIRED  CURRENT  READY   AGE
replicaset.apps/api-gateway-56d49b6fbf  2        2        2       55s
replicaset.apps/api-gateway-5d65d56b55  0        0        0       4m40s
replicaset.apps/api-gateway-65b95667dd  0        0        0       99m
replicaset.apps/api-gateway-67949ccb4f  0        0        0       113m
replicaset.apps/api-gateway-688b4fcba5  0        0        0       118m
replicaset.apps/api-gateway-86b9cb666  0        0        0       128m
replicaset.apps/order-service-5f5d568698  0        0        0       134m
replicaset.apps/order-service-648dcc9b   2        2        2       54s
replicaset.apps/order-service-66cc88cbdc  0        0        0       99m
replicaset.apps/order-service-6bb668bd4b  0        0        0       113m
replicaset.apps/order-service-775c7bf676  0        0        0       118m
replicaset.apps/order-service-798fc6df7d  0        0        0       4m40s
replicaset.apps/user-service-58ab57dc9c  2        2        2       54s
replicaset.apps/user-service-5cbf47cdb9  0        0        0       99m
replicaset.apps/user-service-745c86d8cc  0        0        0       113m
replicaset.apps/user-service-79bd6c7bf4  0        0        0       118m
replicaset.apps/user-service-b665f7dc9  0        0        0       134m
replicaset.apps/user-service-c45864774  0        0        0       4m40s

NAME                           REFERENCE   TARGETS   MINPODS   MAXPODS   REPLICAS   AGE
horizontalpodautoscaler.autoscaling/user-hpa   Deployment/user-service   cpu: <unknown>/>60%  2          10         2          128m

NAME        TYPE   DATA   AGE
secret/appinsights-secret   Opaque  1       96m

NAME        DATA   AGE
configmap/demo-config   2       96m
configmap/kube-root-ca.crt 1       134m
himanshu@Himanshus-MacBook-Pro-5 Azure-demo %

```



```

himanshu@Himanshus-MacBook-Pro-5 Azure-demo % kubectl run tmp --rm -it --image=radial/busyboxplus:curl -n demo -- sh
If you don't see a command prompt, try pressing enter.
[ root@tmp:/ ]$ 
[ root@tmp:/ ]$ nslookup user-svc
Server: 10.0.0.10
Address 1: 10.0.0.10 kube-dns.kube-system.svc.cluster.local

Name: user-svc
Address 1: 10.0.249.62 user-svc.demo.svc.cluster.local
[ root@tmp:/ ]$ 
[ root@tmp:/ ]$ nslookup order-svc
Server: 10.0.0.10
Address 1: 10.0.0.10 kube-dns.kube-system.svc.cluster.local
[ 
Name: order-svc
Address 1: 10.0.33.176 order-svc.demo.svc.cluster.local
[ root@tmp:/ ]$ curl http://user-svc/health
>{"status":"ok"}
[ root@tmp:/ ]$ curl http://order-svc/health
>{"status":"ok"}
[ root@tmp:/ ]$ exit
Session ended, resume using 'kubectl attach tmp -c tmp -i -t' command when the pod is running

E1204 07:40:49.535169 45885 v2.go:104] "Unhandled Error" err="write on closed stream 0"
[pod "tmp" deleted
himanshu@Himanshus-MacBook-Pro-5 Azure-demo %

```

```

< > ⌂ ⏷ Not Secure 48.195.184.67/order/5
Pretty print □

{"id": "5", "total": 99.99}

```

The screenshot shows the GitHub Actions interface for the repository "Himanshumishra2 / Azure-demo". The left sidebar is collapsed, and the main header includes the repository name, a search bar, and several global navigation icons.

The top navigation bar features links for Code, Issues, Pull requests, Actions, Projects, Security, Insights, and Settings. The "Actions" tab is currently selected, indicated by an orange underline.

The left sidebar has sections for Actions, All workflows, Management, Caches, Attestations, Runners, Usage metrics, and Performance metrics. The "All workflows" section is expanded, showing a list for the "CI/CD AKS Microservices" repository.

The main content area displays "All workflows" with a sub-header "Showing runs from all workflows" and a search bar "Filter workflow runs".

A table lists "8 workflow runs" with the following details:

	Event	Status	Branch	Actor	Timestamp	Duration	More
1. Add files via upload	CI/CD AKS Microservices #10: Commit acbeafc pushed by Himanshumishra2	master			12 minutes ago	2m 31s	...
2. Add files via upload	CI/CD AKS Microservices #9: Commit f0e955e pushed by Himanshumishra2	master			14 minutes ago	1m 52s	...
3. Update variables.tf	CI/CD AKS Microservices #8: Commit 042f691 pushed by Himanshumishra2	master			Today at 4:58 PM	17s	...
4. update	CI/CD AKS Microservices #7: Commit cda0840 pushed by Himanshumishra2	master			Today at 9:59 AM	1m 37s	...
5. Update git-ci-ci.yaml	CI/CD AKS Microservices #6: Commit 4862400 pushed by Himanshumishra2	master			Today at 8:56 AM	1m 37s	...
6. Update kubeconfig-demo.yaml	CI/CD AKS Microservices #5: Commit e88fbaf pushed by Himanshumishra2	master			Today at 8:52 AM	1m 29s	...

The screenshot shows the Microsoft Azure Log Analytics interface for the 'demoaks-aks' Kubernetes service. The left sidebar includes links for Diagnose and solve problems, Microsoft Defender for Cloud, Cost analysis, Resource visualizer, Kubernetes resources, Settings, Monitoring, Insights, Alerts, Metrics, Diagnostic settings, Advisor recommendations, Logs (selected), Workbooks, and Dashboards with Grafana (preview). The main area displays a search bar, two query tabs ('New Query 1*' and 'New Query 2*'), and a results table. The table has columns: TimeGenerated [UTC], Computer, ContainerId, ContainerName, and PodName. The results show log entries from 'aks-system-26231704-vms000000' for a container named 'controller' running in a pod 'nginx-ingress'. The log message contains a timestamp of '2025-12-04T11:30:54.758624Z' and a resource ID of '/subscriptions/a4ac1efe-554d-49e3-a933-fb51a91f9838/resourcegroups/demoaks-rg/providers/microsoft.containerservice/managedclusters/dk'. The table also lists TenantId, Computer, ContainerId, ContainerName, PodName, PodNamespace, LogMessage (containing hex and ASCII data), LogSource, TimeGenerated [UTC], LogLevel, Type, and _ResourceId.

TimeGenerated [UTC]	Computer	ContainerId	ContainerName	PodName
04/12/2025, 11:30:54.758	aks-system-26231704-vms000000	3a8191e25e0495ec6ab956a9bd3a7d6e0d59557c5884af7de...	controller	nginx-ingress
	TenantId	facd724e-1c2b-4f42-bc80-f90bdac89f42		
	Computer	aks-system-26231704-vms000000		
	ContainerId	3a8191e25e0495ec6ab956a9bd3a7d6e0d59557c5884af7de8366647912c532c		
	ContainerName	controller		
	PodName	nginx-ingress-ingress-nginx-controller-79fb7c4c9f-rz6fh		
	PodNamespace	ingress-basic		
	LogMessage	162.142.125.210 - [04/Dec/2025:11:30:54 +0000] "x16\x03\x01\x00\xEE\x01\x00\x00\xEA\x03\x03\xBE-\x1C\x08/\xC8\xEA\x7F\x97" 400 15		
	LogSource	stdout		
	TimeGenerated [UTC]	2025-12-04T11:30:54.758624Z		
	LogLevel	unknown		
	Type	ContainerLogV2		
	_ResourceId	/subscriptions/a4ac1efe-554d-49e3-a933-fb51a91f9838/resourcegroups/demoaks-rg/providers/microsoft.containerservice/managedclusters/dk		
> 04/12/2025, 11:30:50.424	aks-system-26231704-vms000000	3a8191e25e0495ec6ab956a9bd3a7d6e0d59557c5884af7de...	controller	nginx-ingress-

Microsoft Azure Upgrade Search resources, services, and docs (G+) Copilot himanshumishra2909@... DEFAULT DIRECTORY (HIMANSH...) ...

Home > Resource Manager | All resources > demoaks-aks

demoaks-aks | Dashboards with Grafana (preview) | Kubernetes | Compute Resources | Cluster

Kubernetes service

Search ... Dashboards Edit Save As Share Export Help Feedback

Data source defaultazuremonitorworkspace-eus cluster demoaks-aks Last 1 hour Refresh 1m

CPU Utilisation CPU Requests C... CPU Limits Com... Memory Utilisation Memory Request... Memory Limits C...

6.24% 102% 2013% 20.2% 22.5% 422%

CPU Usage

Name Last

Name	Last
demo	0.00114
ingress-basic	0.000520
kube-system	0.0334

CPU Quota

Namespace	Pods	Workloads	CPU Usage	CPU Requests	CPU Requests %	CPU Limit
kube-system	24	20	0.0334	1.85	1.81%	38.
demo	9	3	0.00114			
ingress-basic	1	1	0.000520	0.100	0.520%	