

Explore advanced container orchestration with Kubernetes on your cloud platform (e.g., **Amazon EKS**, Azure Kubernetes Service, Google Kubernetes Engine).

Ebuka Obiakor – 9th March, 2024

Things you need to do.

Install the Kubernetes service [Install and Set Up kubectl on Windows | Kubernetes](#)

Install the Amazon CLI (if not installed already)

Set up the cluster with AWS console or CLI (you can also use eksctl). I used the AWS console.

The screenshot shows the 'Configure cluster' page in the AWS Management Console. On the left, a sidebar lists steps: Step 1 (Configure cluster), Step 2 (Specify networking), Step 3 (Configure observability), Step 4 (Select add-ons), Step 5 (Configure selected add-ons settings), and Step 6 (Review and create). The main area is titled 'Configure cluster' and contains the 'Cluster configuration' section. It includes a 'Name' field with a placeholder 'Enter name' and a warning that the name cannot be changed after creation. Below this is the 'Kubernetes version' dropdown, currently set to '1.29'. A blue information box states that Kubernetes version 1.29 reaches the end of standard support on March 23, 2025, and that clusters on this version will be subject to additional fees after the extended support preview ends. At the bottom, the 'Cluster service role' is set to 'eksclusterpolicy'.

Create cluster using console, select Kubernetes version, cluster access, VPC, and then proceed. (Managed EKS is used here). *Ensure to set cluster policy for EKS.*

The screenshot shows the 'project01cluster' details page in the AWS Management Console. At the top, there are buttons for 'Refresh' and 'Delete cluster'. The 'Cluster info' section shows the cluster is 'Active', the Kubernetes version is '1.29', the support type is 'Standard support until March 23, 2025', and the provider is 'EKS'. Below this is a tabbed interface with 'Overview' selected. The 'Details' section displays various endpoints and URLs, including the API server endpoint, Certificate authority, OpenID Connect provider URL, and Cluster IAM role ARN. The 'Health issues' section at the bottom shows '(0)' issues, with a table indicating the cluster is healthy and has no reported health issues.

`"aws eks update-kubeconfig --region <region> --name <cluster_name>"`. This assumes that the aws configure has been set up for the console.

```
PS C:\Users\owner> aws eks describe-cluster --name project01cluster
{
  "cluster": {
    "name": "project01cluster",
    "arn": "arn:aws:eks:us-west-2:058264200429:cluster/project01cluster",
    "createdAt": "2024-03-09T12:06:24.214000-07:00",
    "version": "1.29",
    "endpoint": "https://C8F6FFCFBE1330CEF2DD3EEEE4DB228C.gr7.us-west-2.eks.amazonaws.com",
    "roleArn": "arn:aws:iam:058264200429:role/ekscclusterpolicy",
    "resourcesVpcConfig": {
      "subnetIds": [
        "subnet-0f3f74e1c9919710c",
        "subnet-06b6d065c7ae24ae5",
        "subnet-09f4b2559a23da042"
      ],
      "securityGroupIds": [
        "sg-021afa73f2e3a0f5e"
      ],
      "clusterSecurityGroupId": "sg-09d37867cbc97f75d",
      "vpcId": "vpc-0643a4ed5de6f9925",
      "endpointPublicAccess": true,
      "endpointPrivateAccess": false,
      "publicAccessCidrs": [
        "0.0.0.0/0"
      ]
    },
    "kubernetesNetworkConfig": {
      "serviceIpv4Cidr": "10.100.0.0/16",
      "ipFamily": "ipv4"
    },
    "logging": {
      "clusterLogging": [
        {
          "types": [
```

Overview

Resources

Compute

Networking

Add-ons

Access

Observability

Upgrade insights 1

Update history

Tags

Nodes (2) Info

< 1 >

Node name	Instance type	Node group	Created	Status
ip-192-168-142-68.us-west-2.compute.internal	t2.medium	oeks-node-project	Created 33 minutes ago	Ready
ip-192-168-150-228.us-west-2.compute.internal	t2.medium	oeks-node-project	Created 33 minutes ago	Ready

Node groups (1) Info

Edit

Delete

Add node group

Group name	Desired size	AMI release version	Launch template	Status
oeks-node-project	2	1.29.0-20240307	-	Active

Fargate profiles (0) Info

Edit

Delete

Add Fargate profile

Profile name	Namespaces	Status
No Fargate profiles		
This cluster does not have any Fargate profiles.		
Add Fargate profile		

Deployed a sample application unto the nodes.

```
PS C:\Users\owner> kubectl apply -f https://k8s.io/examples/application/deployment.yaml -n ebuka-namespace
deployment.apps/nginx-deployment created
PS C:\Users\owner> kubectl get deployments
No resources found in default namespace.
PS C:\Users\owner> kubectl get deployments -n ebuka-namespace
NAME                READY   UP-TO-DATE   AVAILABLE   AGE
nginx-deployment    2/2     2            2           58s
PS C:\Users\owner> kubectl describe deployment nginx-deployment
Error from server (NotFound): deployments.apps "nginx-deployment" not found
PS C:\Users\owner> kubectl describe deployment -n ebuka-namespace nginx-deployment
Name:                nginx-deployment
Namespace:           ebuka-namespace
CreationTimestamp:    Mon, 11 Mar 2024 05:27:24 -0600
Labels:               <none>
Annotations:          deployment.kubernetes.io/revision: 1
Selector:             app=nginx
Replicas:             2 desired | 2 updated | 2 total | 2 available | 0 unavailable
StrategyType:        RollingUpdate
MinReadySeconds:      0
RollingUpdateStrategy: 25% max unavailable, 25% max surge
Pod Template:
  Labels:  app=nginx
  Containers:
    nginx:
      Image:        nginx:1.14.2
      Port:         80/TCP
      Host Port:    0/TCP
      Environment:  <none>
      Mounts:       <none>
      Volumes:      <none>
Conditions:
  Type           Status  Reason
  ----           -
  
```

```
NAME                READY   STATUS    RESTARTS   AGE
nginx-deployment-86dcfdf4c6-d2x6x  1/1     Running   0           7m58s
nginx-deployment-86dcfdf4c6-d7qjw  1/1     Running   0           7m58s
PS C:\Users\owner> kubectl describe -n ebuka-namespace pod nginx-deployment-86dcfdf4c6-d2x6x
Name:                nginx-deployment-86dcfdf4c6-d2x6x
Namespace:           ebuka-namespace
Priority:             0
Service Account:     default
Node:                ip-192-168-150-228.us-west-2.compute.internal/192.168.150.228
Start Time:          Mon, 11 Mar 2024 05:27:24 -0600
Labels:              app=nginx
                    pod-template-hash=86dcfdf4c6
Annotations:         <none>
Status:              Running
IP:                 192.168.155.85
IPs:
  IP:                192.168.155.85
Controlled By:       ReplicaSet/nginx-deployment-86dcfdf4c6
Containers:
  nginx:
    Container ID:     containerd://3d30b991534b607919c2ac893c7efb8ed9cf71be56efe745b85cdc72895e0300
    Image:            nginx:1.14.2
    Image ID:         docker.io/library/nginx@sha256:f7988fb6c02e0ce69257d9bd9cf37ae20a60f1df7563c3a2a6abe24160306b8d
    Port:             80/TCP
  
```

```

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deployment.apps/nginx-deployment created
PS C:\Users\owner> kubectl get deployments
No resources found in default namespace.
PS C:\Users\owner> kubectl get deployments -n ebuka-namespace
NAME                READY   UP-TO-DATE   AVAILABLE   AGE
nginx-deployment    2/2     2             2           58s
PS C:\Users\owner> kubectl describe deployment nginx-deployment
Error from server (NotFound): deployments.apps "nginx-deployment" not found
PS C:\Users\owner> kubectl describe deployment -n ebuka-namespace nginx-deployment
Name:                nginx-deployment
Namespace:            ebuka-namespace
CreationTimestamp:    Mon, 11 Mar 2024 05:27:24 -0600
Labels:               <none>
Annotations:          deployment.kubernetes.io/revision: 1
Selector:              app=nginx
Replicas:              2 desired | 2 updated | 2 total | 2 available | 0 unavailable
StrategyType:          RollingUpdate
MinReadySeconds:       0
RollingUpdateStrategy: 25% max unavailable, 25% max surge
Pod Template:
  Labels:  app=nginx
  Containers:
    nginx:
      Image:      nginx:1.14.2
      Port:       80/TCP
      Host Port:  0/TCP
      Environment: <none>
      Mounts:      <none>
      Volumes:     <none>
Conditions:
  Type           Status  Reason
  ----           -

```

```

NAME                READY   STATUS    RESTARTS   AGE
nginx-deployment-86dcfdf4c6-d2x6x  1/1     Running   0           7m58s
nginx-deployment-86dcfdf4c6-d7qjw  1/1     Running   0           7m58s
PS C:\Users\owner> kubectl describe -n ebuka-namespace pod nginx-deployment-86dcfdf4c6-d2x6x
Name:                nginx-deployment-86dcfdf4c6-d2x6x
Namespace:            ebuka-namespace
Priority:              0
Service Account:      default
Node:                 ip-192-168-150-228.us-west-2.compute.internal/192.168.150.228
Start Time:           Mon, 11 Mar 2024 05:27:24 -0600
Labels:               app=nginx
                     pod-template-hash=86dcfdf4c6
Annotations:          <none>
Status:               Running
IP:                   192.168.155.85
IPs:
  IP:                 192.168.155.85
Controlled By:        ReplicaSet/nginx-deployment-86dcfdf4c6
Containers:
  nginx:
    Container ID:      containerd://3d30b991534b607919c2ac893c7efb8ed9cf71be56efe745b85cdc72895e0300
    Image:              nginx:1.14.2
    Image ID:           docker.io/library/nginx@sha256:f7988fb6c02e0ce69257d9bd9cf37ae20a60f1df7563c3a2a6abe24160306b8d
    Port:               80/TCP

```

Cleaned up (deleted) resources – example for demo only

Resources / links

<https://docs.aws.amazon.com/eks/latest/userguide/getting-started-console.html>
<https://kubernetes.io/docs/tasks/run-application/run-stateless-application-deployment/>
https://www.youtube.com/watch?v=CukYk43agA4&ab_channel=KodeKloud
<https://youtu.be/O4h69KMm2tE?si=ci67GM9oGhw4SI12>
https://www.youtube.com/watch?v=DcnviAwzmM4&ab_channel=K21Academy