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Launch a Kubernetes Cluster

MA

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The screenshot shows the AWS EKS Cluster Overview page for the 'nextwork-eks-cluster'. The left sidebar includes links for Amazon Elastic Kubernetes Service, Clusters, Amazon EKS Anywhere, Related services (Amazon ECR, AWS Batch), and Console settings/Documentation/Feedback. The main content area displays cluster health metrics (0 issues), upgrade insights (5 pending), and node health metrics (0 issues). The 'Compute' tab is selected. Below, the 'Nodes (3) Info' section lists three t2.micro nodes managed by 'nextwork-nodegroup', all created an hour ago and marked as 'Ready'. A 'Node groups (1) Info' section shows one group named 'nextwork-nodegroup'. Action buttons for Edit, Delete, and Add node group are at the bottom.

Node name	Instance type	Managed by	Status
ip-192-168-26-199.eu-west-2.compute.internal	t2.micro	nextwork-nodegroup	Created an hour ago Ready
ip-192-168-63-168.eu-west-2.compute.internal	t2.micro	nextwork-nodegroup	Created an hour ago Ready
ip-192-168-66-137.eu-west-2.compute.internal	t2.micro	nextwork-nodegroup	Created an hour ago Ready

Introducing Today's Project!

In this project, I will deploy my first Kubernetes cluster using Amazon EKS. This is because EKS is AWS Service for deploying Kubernetes cluster in the cloud. I also get to learn the tools like eksctl and CloudFormation. I will... because

What is Amazon EKS?

Amazon EKS is a fully managed Kubernetes service that enables you to run Kubernetes seamlessly in both AWS Cloud and on-premises data centers. I used it in today's project to create my first cluster.

One thing I didn't expect

I didn't expect in this project that eksctl was not already installed in my EC2 instance but they have simplified the resources creation and I didn't expect that when you delete nodes Kubernetes automatically detects the change and launches new nodes

This project took me...

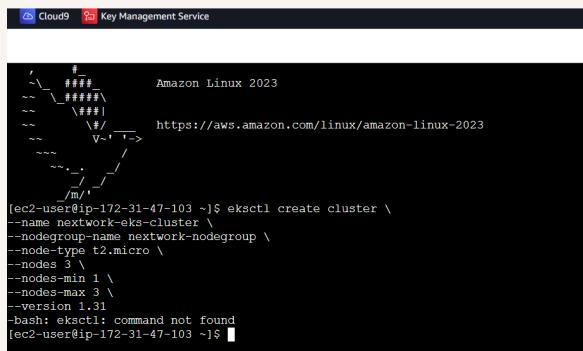
This project took me 2 hours to complete. The part that took me the longest would be EC2 set up, downloading of the eksctl and granting of IAM role for permissions to use eksctl.

What is Kubernetes?

Kubernetes is an open source container orchestration platform that automates many of the manual processes. Companies and developers use Kubernetes to deploy, manage, and scale containerized applications.

I used eksctl to create a Kubernetes cluster using the command line. The 'eksctl' create cluster command I ran defined the name of the cluster, its node group's name and node size settings. I also defined the region and the instance type of EC2.

initially ran into two errors while using eksctl. The first one was because I have not installed eksctl yet. The second one was because. The second one was because my EC2 instance did not have permissions to my AWS account services yet.



The screenshot shows a Cloud9 terminal window with the following content:

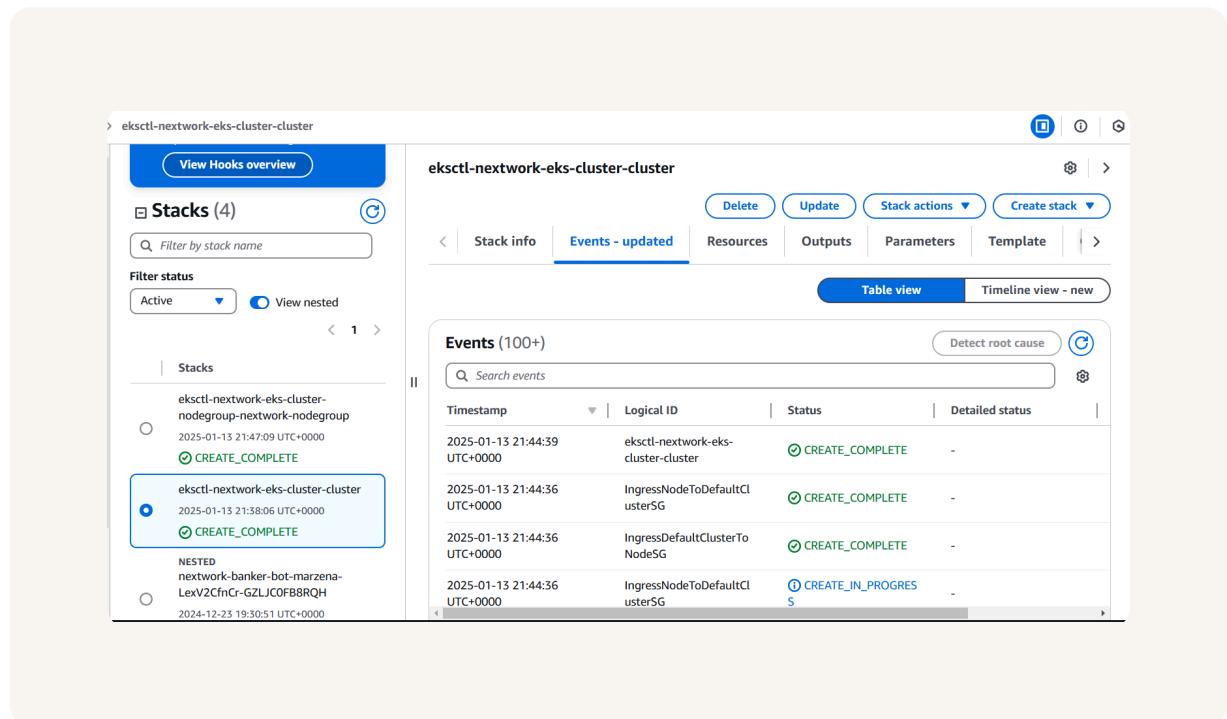
```
Cloud9 Key Management Service
Amazon Linux 2023
https://aws.amazon.com/linux/amazon-linux-2023

[ec2-user@ip-172-31-47-103 ~]$ eksctl create cluster \
--name nextwork-eks-cluster \
--nodegroup-name nextwork-nodegroup \
--node-type t2.micro \
--nodes 3 \
--nodes-min 1 \
--nodes-max 3 \
--version v1.31
bash: eksctl: command not found
[ec2-user@ip-172-31-47-103 ~]$
```

eksctl and CloudFormation

CloudFormation helped create my EKS cluster because eksctl actually uses CF under the hood to create my EKS cluster when I ran eksctl command. It created VPC resources because creating the EKS cluster in my default VPC would cause compatibility issue

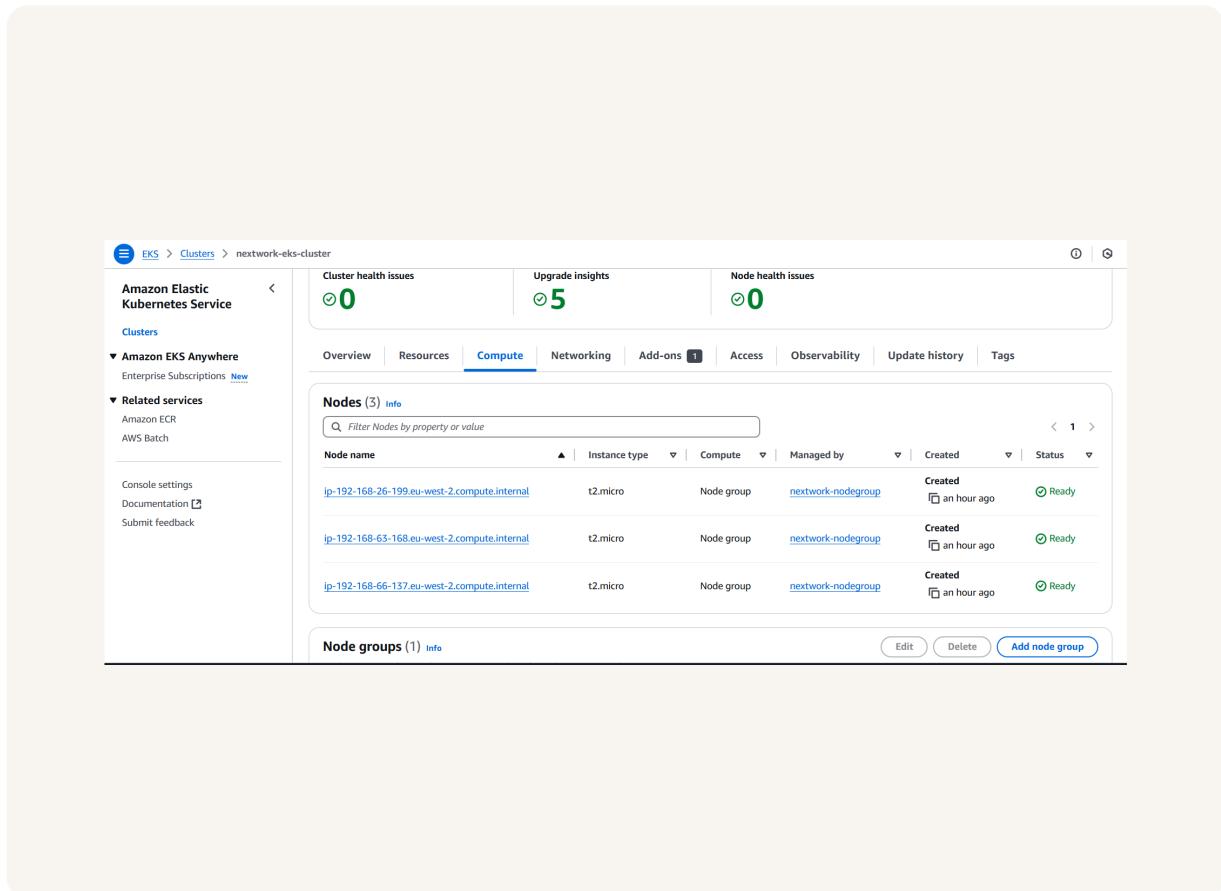
There was also a second CloudFormation stack for the node group. The difference between a cluster and node group is that cluster is made up of nodes (the servers that actually run my containers) . The node group is a group of EC2 instances inside.



The EKS console

I had to create an IAM access entry in order to see the nodes in my new node group. An access entry is a mapping of AWS IAM policies to Kubernetes access control system. I set it up by using the Access Entries page within EKS Management console.

It took 40 minutes to create my cluster. Since I'll create this cluster again in the next project of this series, maybe this process could be sped up if I used templates as Terraform or CloudFormation and install eksctl.



EXTRA: Deleting nodes

Did you know you can find your EKS cluster's nodes in Amazon EC2? This is because EC2 is the node in Kubernetes clusters/ setups using AWS.

Desired size is in the Kubernetes node group the the number of nodes that I want to keep, the Minimum size is 1, and the maximum size is 3 nodes. The minimum and maximum sizes are helpful for maintaining high availability (even in low traffic periods).

When I deleted my EC2 instances and I have refreshed the page, I noticed that new instances were launched to replace the terminated ones. This is because Kubernetes automatically detects the change and launches new nodes to keep the cluster running.

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The screenshot shows the AWS Cloud9 IDE interface. On the left, there's a sidebar with navigation links: Dashboard, EC2 Global View, Events, Instances (selected), Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, and Dedicated Hosts. The main content area is titled "Instances (4) info". It displays a table with four rows of running instances. The columns are: Name, Instance ID, Instance state, Instance type, and Status check. Each row includes a checkbox, a link to the instance ID, and a green circular icon indicating the instance is running. The status check column shows "2/2 checks" for all instances.

Name	Instance ID	Instance state	Instance type	Status check
nextwork-eks-instance	i-00c7d95fb80e5498b	Running	t2.micro	2/2 checks
nextwork-eks-cluster-nextwork-nodegroup-...	i-0b099112542539353	Running	t2.micro	2/2 checks
nextwork-eks-cluster-nextwork-nodegroup-...	i-0b9a9e916eee4bf4d	Running	t2.micro	2/2 checks
nextwork-eks-cluster-nextwork-nodegroup-...	i-0c496ba16bb363b0a	Running	t2.micro	2/2 checks



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