Setting up Kubernetes Cluster on AWS EC2

Abstract:

The past half a decade has seen an exponential rise in computing. Applications have far outgrown the client-server model, and distributed computing has become the norm. Kubernetes on AWS offers one of the most powerful distributed computing platforms. Technologies like Amazon Fargate and the vast outreach of Amazon's cloud computing infrastructure, the Elastic Kubernetes Service or EKS can offer a truly distributed environment where our applications can run and scale.

Setting up Kubernetes with AWS with the help of AWS Web console is probably not the quickest way to get started for many developers and companies. In this project, we will give you the straightforward path for launching Kubernetes on AWS and through docker containers we launch the application.

Existing System:

So why do we care about spinning up an EKS cluster on Amazon? In the existing scenario, there were multiple cloud vendors like Azure or GCP. Let us understand the multitude of reasons here.

Complexity: Bootstrapping Kubernetes cluster is a bad idea,
Integration: AWS'EKS works out-of-the-box with the rest of Amazon's Infrastructure
True Scalability: Amazon EKS provides far better scalability than self-hosted Kubernetes.
Fargate and Firecracker: VM instances run on virtualized hardware i.e., software pretending to be hardware.

This results in better overall cloud infrastructure security with GCP or Azure.

Proposed System:

An EKS cluster consists of two broad components:

1. **The Control Plane**: This service is entirely managed by AWS, as in you WILL NOT have EC2 instances created in your account, where you may expect etcd, kube-apiserver, and other components to show up. Instead, all of that is abstracted away from you, and the control plane is just exposed to you as a server, i.e., the kube-api. The control plane costs $0.10 per hour. Fortunately, you can use a single cluster to run multiple applications.

2. **The Nodes**: These can, in turn, be managed EC2 instances or run upon AWS Fargate. **Managed EC2** instances option is where AWS spins up EC2 instances on

your behalf and gives the Control Plane control over those instances. These show up as EC2 instances in your account.

Software Tools:

1. AWS EC2
2. AWS IAM
3. AWS CLI
4. AWS EKS
5. EKS Dashboard
6. AWS Fargate

Hardware Tools:

1. Laptop
2. Operating System: Windows 11
3. RAM: 16GB
4. ROM: 4GB
5. Fast Internet Connectivity

Applications:

1. Auto Scaling for billions of user load
2. You can deploy any kind of project through docker and this architecture will auto scale the project.