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AWS EKS & EFS - A solution to deploy any web application in a one click efficiently

By Rohit Ghumare, solo.io | 10 Dec 2022

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Who am I?

Rohit Ghumare

I am Developer Advocate at solo.io

Founder of communities:

- Keep Up
- DevOps Community
- Developer Relations Community

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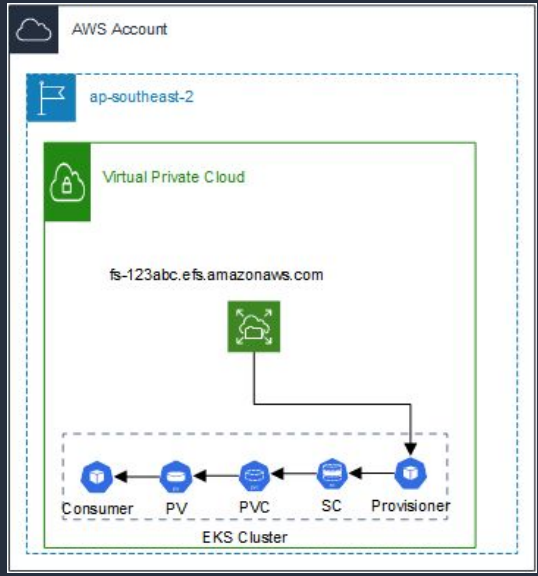
What you will learn today?

- Simple Application Deployment
- Efficient way for Application Deployment
- Kubernetes Overview through EKS
- AWS services like EC2, PVC, Fargate, ELB, and EFS
- Wordpress & MySQL deployment - Demo
- Service Mesh
- Sample Application deployment on Istio Ambient Mesh



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Let’s Go!!!

Why EKS? Elastic Kubernetes Service

- Amazon Elastic Kubernetes Service (Amazon EKS) is a fully managed Kubernetes service.
- Customers trust EKS to run their most sensitive and mission-critical applications because of its security, reliability, and scalability.
- EKS is deeply integrated with services such as Amazon CloudWatch, Auto Scaling Groups, AWS Identity and Access Management (IAM), and Amazon Virtual Private Cloud (VPC), providing you a seamless experience to monitor, scale, and load-balance your applications.
- It’s easy to integrate.
- Awesome Documentation by AWS.
- Kubernetes Multi-node clusters are easy to create here.

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eksctl - command line tool

- eksctl is a simple CLI tool for creating and managing clusters on EKS - Amazon's managed Kubernetes service for EC2.
- It is written in Go, uses CloudFormation, was created by Weaveworks.
- Create a basic cluster in minutes with just one command:

```
eksctl create cluster
```

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But... Why EFS?

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Note on EBS Volumes

- EBS volumes are tied to an Availability Zone (AZ)
- Re-created pods can only be started in the AZ of the previous EBS volume

Wordpress Volumes

- To properly deploy Wordpress, we need a shared volume between all the pods (specific to Wordpress)
- We want deploy our pods in multiple AZ
- But that shared volume cannot be an EBS volume because EBS volumes are not multi AZ
- Therefore the shared volume must be Amazon EFS (Elastic File System)

But... Why EFS?

EFS is the storage option for EC2, that can be attached to ***more than one EC2***, rememb
can only be attached to one EC2

EFS is Elastic, and it is scalable (The ***storage capacity will increase or decrease as you add files to it***, It is not like Volume)

Supports the ***Network File System Version 4 (NFSv4)*** protocol

You only pay for the ***storage you use*** (no pre-provisioning required)

Can scale up to the ***petabytes***

Demo

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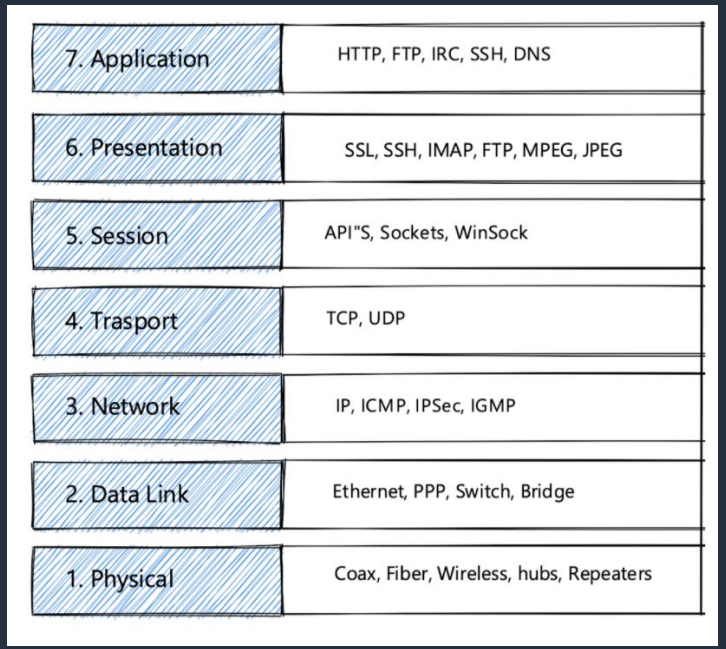
EKS Cluster Creation

```
rohit-mac@Rohits-MacBook-Pro eks_class_code % eksctl create cluster -f cluster.yml
2022-11-04 10:37:26 [ℹ]  eksctl version 0.115.0
2022-11-04 10:37:26 [ℹ]  using region ap-south-1
2022-11-04 10:37:26 [ℹ]  skipping ap-south-1c from selection because it doesn't support the following instance type(s): t2.micro,t2.small
2022-11-04 10:37:26 [ℹ]  setting availability zones to [ap-south-1a ap-south-1b]
2022-11-04 10:37:26 [ℹ]  subnets for ap-south-1a - public:192.168.0.0/19 private:192.168.64.0/19
2022-11-04 10:37:26 [ℹ]  subnets for ap-south-1b - public:192.168.32.0/19 private:192.168.96.0/19
2022-11-04 10:37:27 [ℹ]  nodegroup "ng1" will use "ami-09115f30a400e6e15" [AmazonLinux2/1.23]
2022-11-04 10:37:27 [ℹ]  using EC2 key pair "eks-key"
2022-11-04 10:37:27 [ℹ]  nodegroup "ng2" will use "ami-09115f30a400e6e15" [AmazonLinux2/1.23]
2022-11-04 10:37:27 [ℹ]  using EC2 key pair "eks-key"
2022-11-04 10:37:27 [ℹ]  nodegroup "ng-mixed" will use "ami-09115f30a400e6e15" [AmazonLinux2/1.23]
2022-11-04 10:37:27 [ℹ]  using EC2 key pair "eks-key"
2022-11-04 10:37:27 [ℹ]  using Kubernetes version 1.23
2022-11-04 10:37:27 [ℹ]  creating EKS cluster "acd-nashik" in "ap-south-1" region with un-managed nodes
2022-11-04 10:37:27 [ℹ]  3 nodegroups (ng-mixed, ng1, ng2) were included (based on the include/exclude rules)
2022-11-04 10:37:27 [ℹ]  will create a CloudFormation stack for cluster itself and 3 nodegroup stack(s)
2022-11-04 10:37:27 [ℹ]  will create a CloudFormation stack for cluster itself and 0 managed nodegroup stack(s)
2022-11-04 10:37:27 [ℹ]  if you encounter any issues, check CloudFormation console or try 'eksctl utils describe-stacks --region=ap-south-1 --cluster=acd-nashik'
2022-11-04 10:37:27 [ℹ]  Kubernetes API endpoint access will use default of {publicAccess=true, privateAccess=false} for cluster "acd-nashik" in "ap-south-1"
2022-11-04 10:37:27 [ℹ]  CloudWatch logging will not be enabled for cluster "acd-nashik" in "ap-south-1"
2022-11-04 10:37:27 [ℹ]  you can enable it with 'eksctl utils update-cluster-logging --enable-types={SPECIFY-YOUR-LOG-TYPES-HERE (e.g. all)} --region=ap-south-1 --cluster=acd-nas
ik'
2022-11-04 10:37:27 [ℹ]
2 sequential tasks: { create cluster control plane "acd-nashik",
    2 sequential sub-tasks: {
        wait for control plane to become ready,
        3 parallel sub-tasks: {
            create nodegroup "ng1",
            create nodegroup "ng2",
            create nodegroup "ng-mixed",
        },
    }
}
2022-11-04 10:37:27 [ℹ]  building cluster stack "eksctl-acd-nashik-cluster"
2022-11-04 10:37:27 [ℹ]  deploying stack "eksctl-acd-nashik-cluster"
2022-11-04 10:37:57 [ℹ]  waiting for CloudFormation stack "eksctl-acd-nashik-cluster"
```



Load Balancers, Proxies, WAFs…
API Gateways, *Service Mesh*
(Istio)

CNI (Cilium, Calico, Weave,
Antrea) SDN (VPC, VXLAN)

Physical (Switches/Routers) x86 +
ARM virtualization

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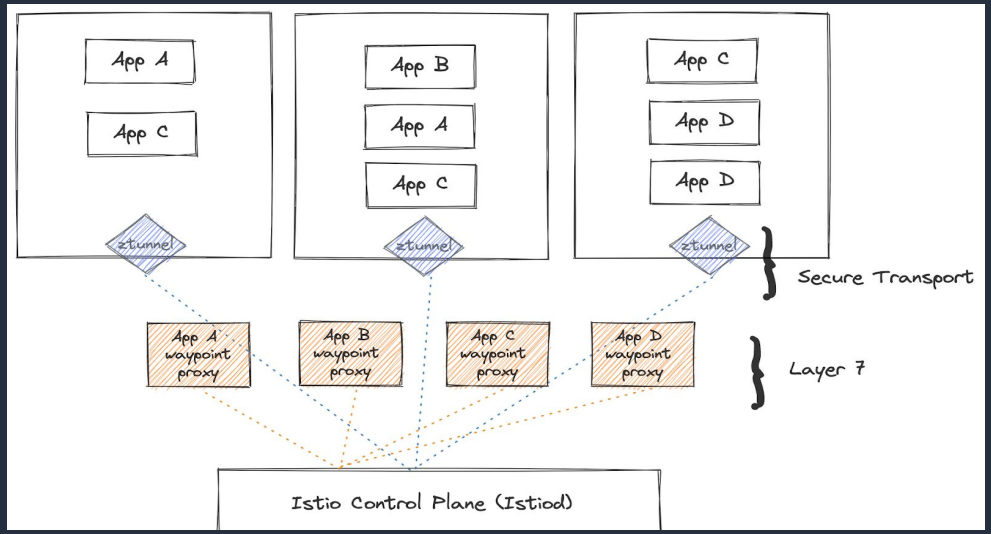
What's Next?

- Istio Service Mesh
- Ambient Service Mesh

ambient mesh | Istio



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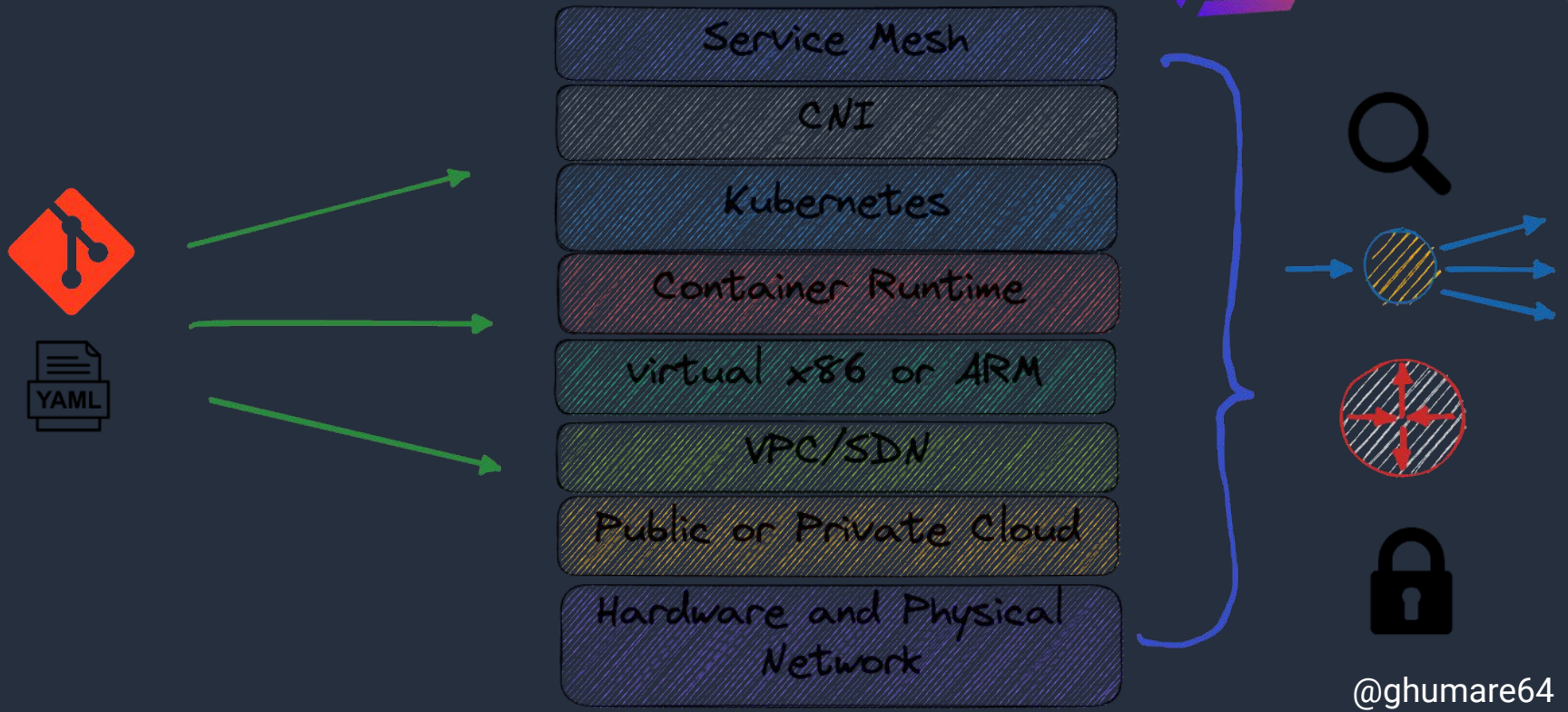
The New Network Stack



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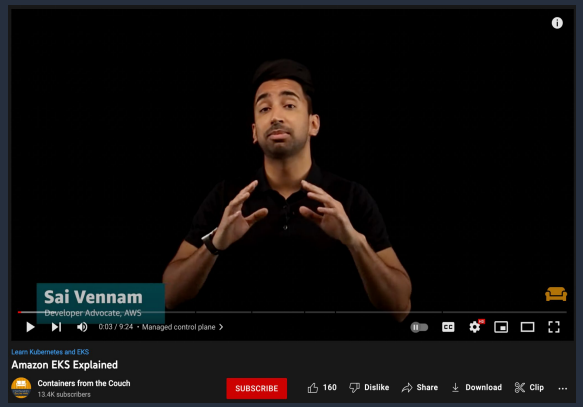
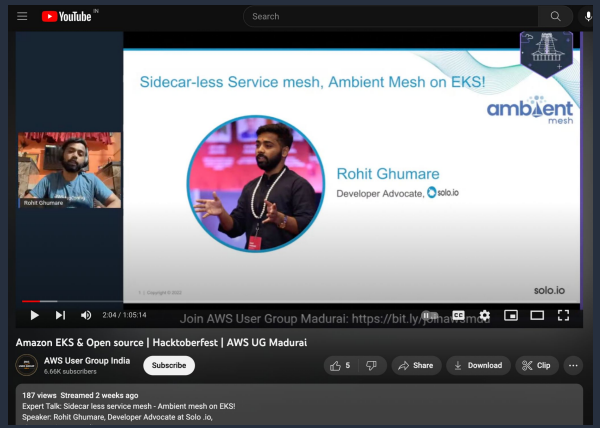
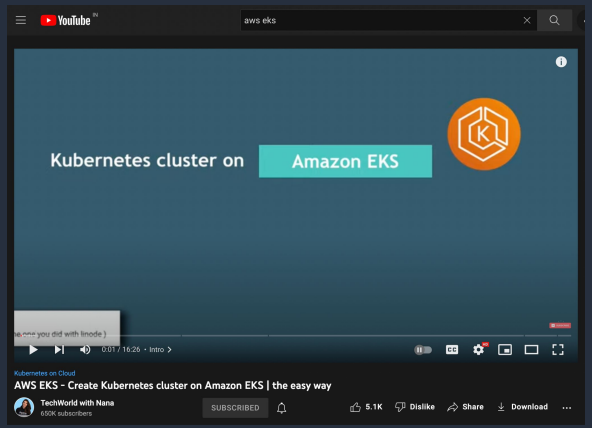
Resources

- Istio Ambient Mesh - Hands On Training & Certification [FREE] →
- AWS Training and Certification [FREE]
- Amazon EKS docs - Best
- Deploying Infrastructure(FrontEnd + BackEnd) on AWS using Amazon EKS 🚀 - Blog







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“Learn by doing & Learn in Public”

- Rohit Ghumare

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Reach out to me -

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Thank you!

See you at the AWS Community Day Pune 2023