

EKS DevSecOps Project

AGENDA

- Project requirements
- Planning
- Proposed Solution
- Demo
- Other considerations
- Documentation
- Challenges

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POC project Duration: 7/11/2023 - 21/11/2023



Project Requirements

- Deploy Kubernetes Cluster (Using AWS)
- Deploy an Application using CICD
- Infrastructure as Code (IaC)
- Git repository
- Integrate Security in pipeline
- Have fun



EKS Cluster/Network Planning

Networking Access for Application

- Access from the internet?
- Outbound internet access
- Private access to AWS services

Access to Cluster Endpoint

- Public Endpoint? (Default)
- Public and Private endpoint?
- Private Endpoint Only?

Environment Isolation & tenancy

- Multi Cluster Isolation
- Single Cluster (Namespace)
- Cost or Security concerns

Choice of CI/CD Tool

FEATURES	Considerations
Current/Primary SCM	Github, Gitlab, Bitbucket
Server management	SaaS, Self Hosted
Integrations	Wide Integration options
Pricing	Small Projects, Open Source, Self Hosted
Ease of Use	Pipeline Configuration, UI experience, Community support



Other Requirements

Choice of IaC	Terraform or Cloudformation or CDK <ul style="list-style-type: none">● Providers● Modularization● Community support● Multi-cloud● Adoption of new services● State management
CD	<ul style="list-style-type: none">● Push based● Pull based



Scenario

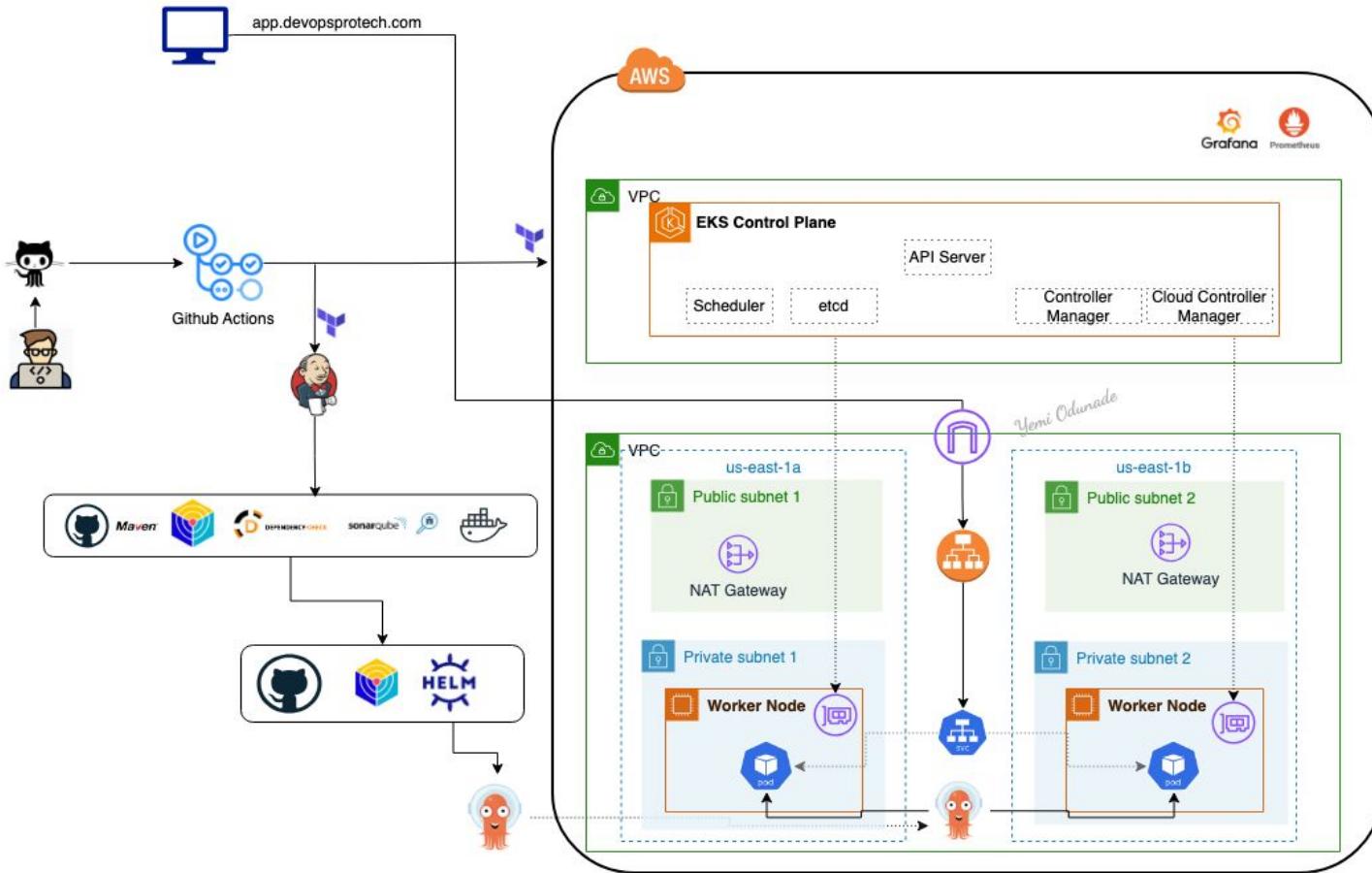
- Web Application needs to be accessible from the Internet
- Cluster Endpoint should be accessible from the internet
- IaC need to be able to work with multiple providers
- Automate Infrastructure deployment
 - + CI/CD tool integrate with Github
- Application pipeline: Integrates with most SCMs
 - + Numerous Integration options
- Adopts a GitOps approach for CD



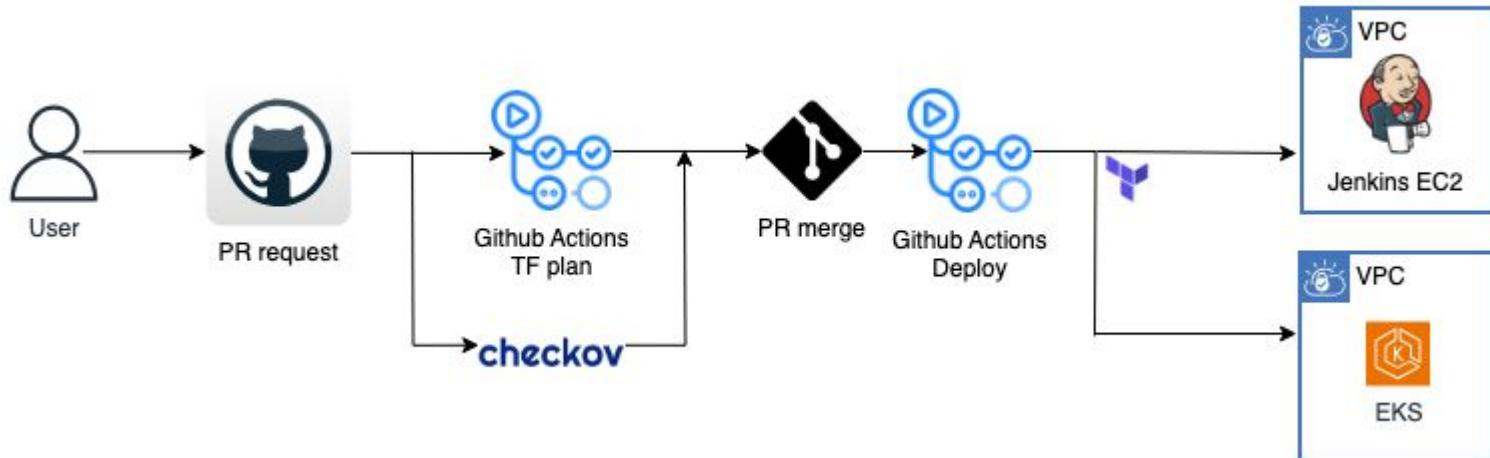
Proposed Solution

- Deploy Kubernetes Cluster: AWS
- Infrastructure as Code (IaC): Terraform
- Git repository: Github
- Deploy an Application using CICD: Jenkins + Argo CD
- Integrate Security in pipeline: Checkov, Trivy, OWASP

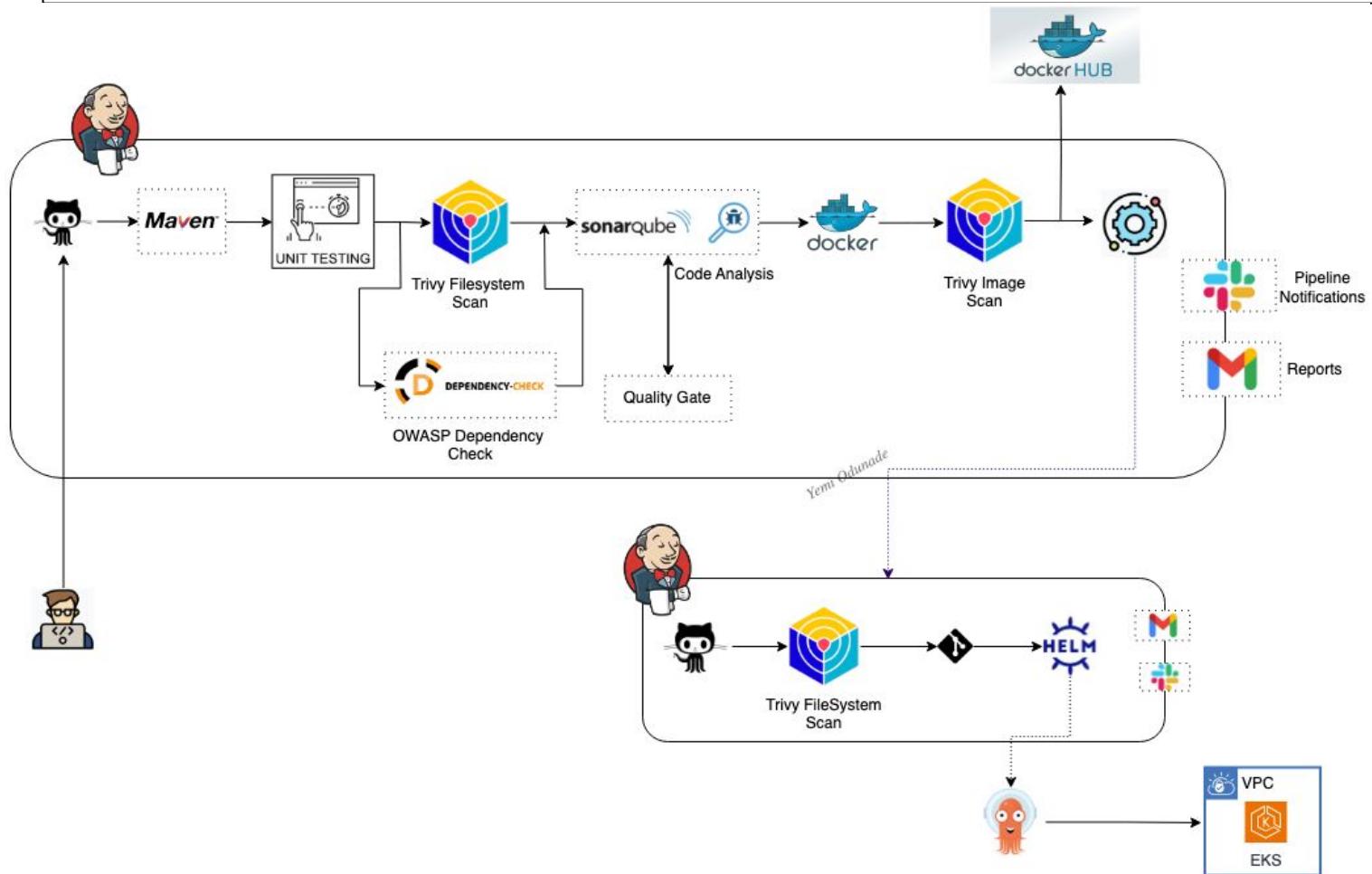
Proposed Solution



Infrastructure Pipeline



Application Pipeline



Demo

Jenkins Pipeline

Build, Compile, Security Scans

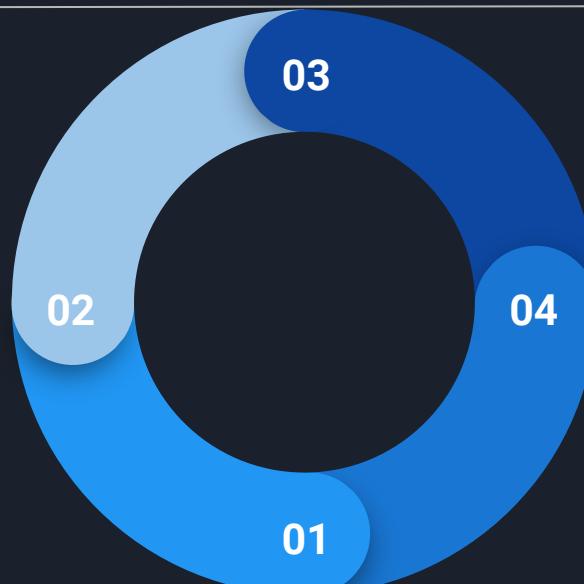
Development

Type of Application
Make an app change

Argo CD

Rollout

Monitoring





Demo - Review

1. Infrastructure Pipeline review
 - PR
 - Terraform plan
 - Checkov results
2. Application pipeline review
3. Login Page
4. ArgoCD sync
5. Grafana
6. Slack

Other Considerations

- ECR
- Cluster Scanning: DAST
- Fargate or Managed Node Groups
- Data Storage Options: EBS or RDS
- Access Management: RBAC
- Logging





Challenges

- Coming up with a solution for branch protection rules and where to store Kubernetes Manifest
- Using Github Actions for the Infrastructure pipeline
- Learning to use Karpenter, troubleshooting Issue



Documentation

- Infrastructure repository
<https://github.com/yemisprojects/eks-infra>
- Application repository
<https://github.com/yemisprojects/eks-app/tree/main>
- Helm chart repository
<https://github.com/yemisprojects/kubernetes-manifests>



Thank you!

Questions?

