What is gitops

GitOps uses Git repositories as a single source of truth to deliver infrastructure as code. Submitted code checks the CI process, while the CD process checks and applies requirements for things like security, infrastructure as code, or any other boundaries set for the application framework. All changes to code are tracked, making updates easy while also providing version control should a rollback be needed.

GitOps delivers:

- A standard workflow for application development
- Increased security for setting application requirements upfront
- Improved reliability with visibility and version control through Git
- Consistency across any cluster, any cloud, and any on-premise environment

https://www.redhat.com/en/topics/devops/what-is-gitops#:~:text=GitOps%20uses%20Git%20repositories%20as,set%20for%20the%20application%20framework.

Explain The difference between other Cd tool (Jenkins) and ArgoCD
Explain the workflow of Jenkins CD

Explain the workflow of ArgoCD

- https://codefresh.io/learn/argo-workflows/#:~:text=Argo%20Workflows%20let%20you%20 define,Workflows%2C%20which%20 provides%20a%20generateName.

Advantages of ArgoCD over Jenkins or FluxCD

- Argo CD is installed and managed in a Kubernetes native way. It is easier to manage than the other two tools - Jenkins and Flux CD.
- Argo CD supports multi-tenancy. On the other hand, Flux CD and Jenkins do not support multi-tenancy applications by default.

  https://www.tynybay.com/our-thinking/argocd-vs-fluxcd-vs-jenkins-x-which-gitops-implementation-tool-suits-you-the-best

Benefits of ArgoCD

- Whole K8s configuration defined as Code in Git Repository
- Config Files are not applied manually from local laptops and executing scripts and doing “kubectl apply” and “helm install” commands, they all will use Same Interface for updating the cluster (ie. git commit).

- ArgoCD does not only watch the changes in git repo, it also watches the changes in the cluster as well. And anytime any change happens either in git repo or in cluster, it compares those two states and if it sees that something is changed in either of the states or the desired state in git repo does match the actual cluster then it immediately syncs the git repo with the cluster.
    - ❖ Guarantees that K8S manifests in Git remains a single source of truth.
    - ❖ Full cluster transparency

- If we want, we can Configure ArgoCD to not sync manual cluster changes automatically, instead of that we can configure it to Send alerts.

    - ❖ single interface
    - ❖ version controlled change
    - ❖ history of changes
    - ❖ better team collaboration
    - ❖ Easy Rollback

Installation

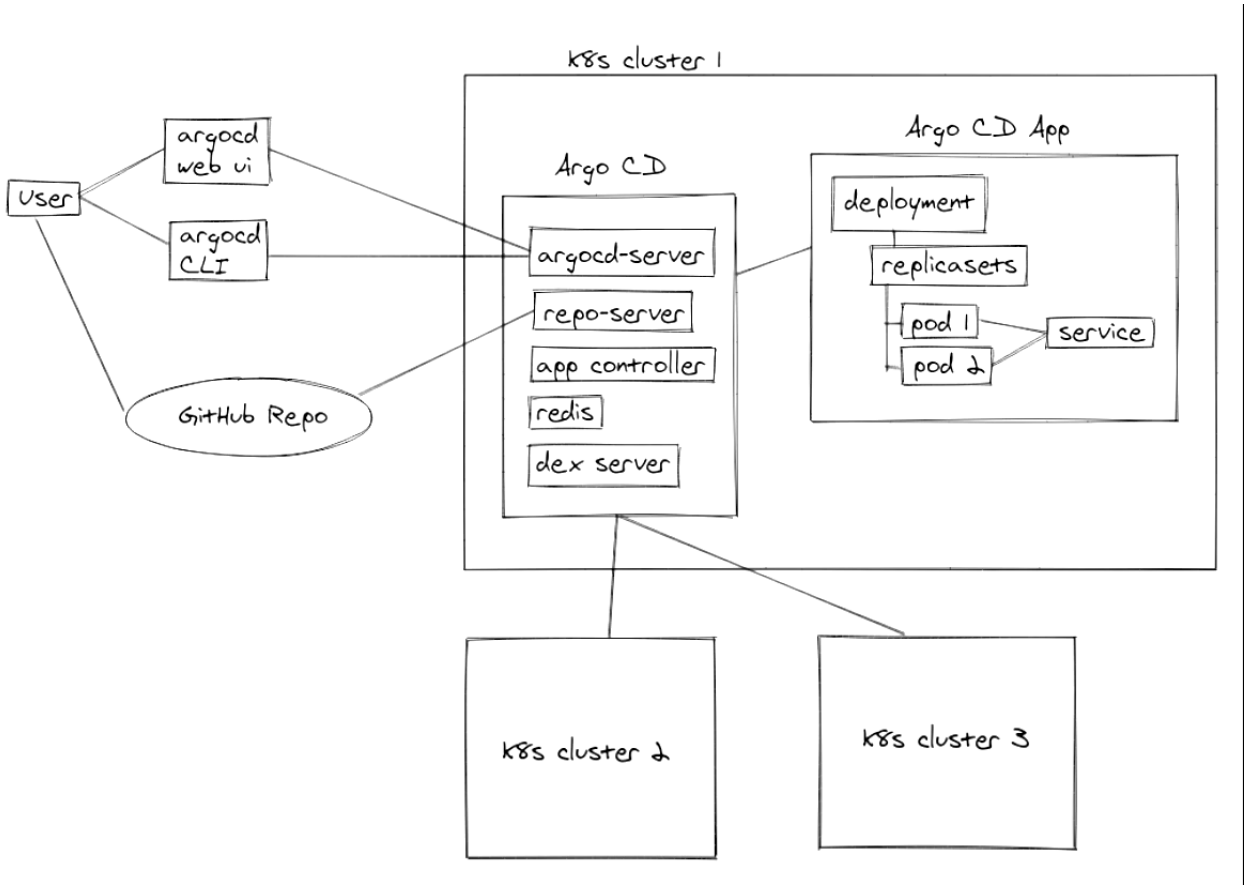
Argo CD is installed and managed in a native Kubernetes way.It runs in its own namespace on Kubernetes, with all configurations saved in Config Maps, Secrets, and Custom Resources.

- kubectl create namespace argocd
- kubectl apply -n argocd -f https://raw.githubusercontent.com/argoproj/argo-cd/stable/manifests/install.yaml

access ArgoCD UI

- kubectl get svc -n argocd
- kubectl port-forward svc/argocd-server 8080:443 -n argocd

ArgoCD Architecture



- ArgoCD dashboard Walk around
- ArgoCD continuous deployment using git repo
- ArgoCD continuous deployment using helm repo
- ArgoCD creating app using CRD (custom resource definition)

ArgoCd CLI

So far, we have seen Argo CD with UI mostly and now let's see another feature provided by Argo CD, which is CLI to manage the Argo CD. CLI provides almost the same feature as GUI, you can perform most of the operation done via UI using CLI.

Installation

- curl -sSL -o /usr/local/bin/argocd https://github.com/argoproj/argo-cd/releases/latest/download/argocd-linux-amd64
- chmod +x /usr/local/bin/argocd

After installation we need to login to the server

- argocd login $ARGOCD_SERVER --username admin --password $ARGO_PWD --insecure

Argocd cli commands : https://argo-cd.readthedocs.io/en/stable/user-guide/commands/argocd/

https://github.com/foxutech/kubernetes/tree/main/argocd

Topics to be covered in ArgoCD PPT

- What is gitops
- Why gitops
- Gitops tools : open source gitops tools
- Gitops tools differences
- What is argocd, Architecture, workflow