GitOps with ArgoCD

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https://github.com/nirumand/gitops-demo-config

Topics

- Concepts recap
  - CI/CD
  - GitOps

- ArgoCD
  - Configuration
  - Installation

- Demo
  - Raw kubernetes manifests
  - Helm charts
  - App-of-apps pattern
  - Sync-windows

Concepts – CI/CD

- Typical CI/CD pipeline

- If deployment fails, you need to start to build again

- It is expensive and takes resources

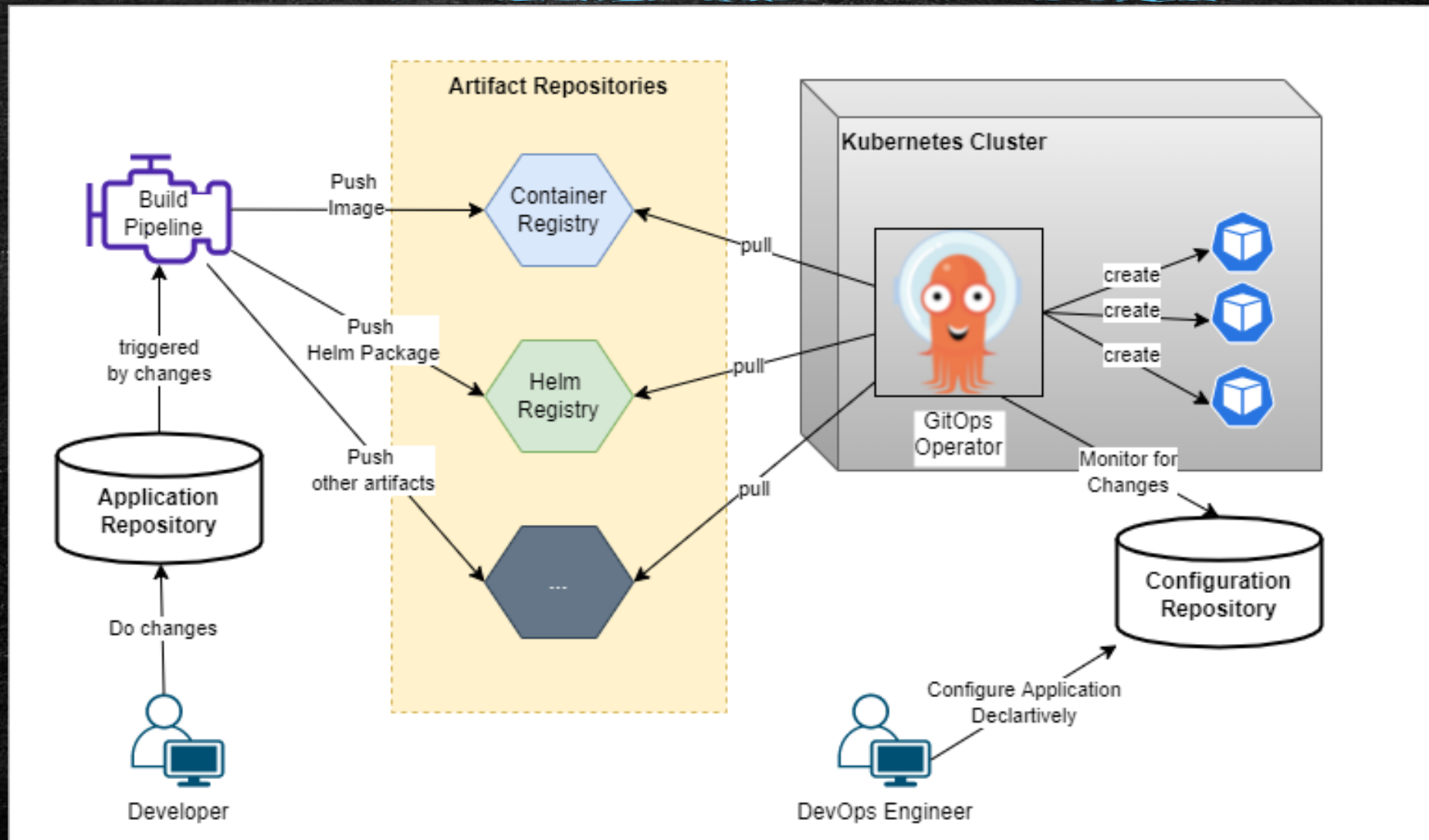- CI/CD tools (usually external) has cluster permissions

Concepts – GitOps

- GitOps is a way of implementing Continuous Deployment for cloud native applications

- Move to immutable infrastructure and declarative container orchestration

Concepts – GitOps : How it Works

Concepts – GitOps : Benefits

- Declarative description of desired system

- Secured deployment

- Automated deployment

- Approved changes

- Single source-of-truth

- Versioned configuration

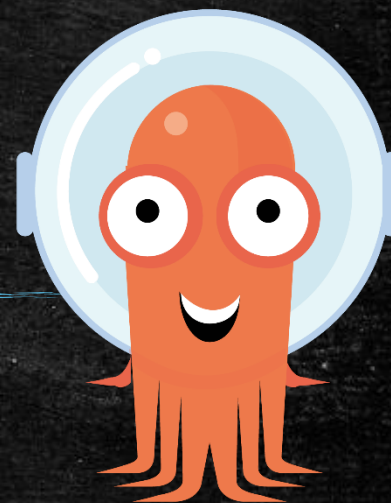- Ensure on correctness

- Alert on divergence

ArgoCD

Is a declarative GitOps tool for Kubernetes.

ArgoCD

- **Configuration**:
  - Can be configured declaratively
    - https://argo-cd.readthedocs.io/en/stable/operator-manual/declarative-setup/

- **Installation**:
  - You can use Helm. Just update `values.yaml`
    - https://github.com/argoproj/argo-helm/blob/master/charts/argo-cd/values.yaml

  - Once configured install using `kubectl apply -f <file/url> -n argocd`
    - `kubectl apply -f` https://github.com/nirumand/gitops-demo-config/blob/main/manifests/argocd-install.yaml `-n argocd`
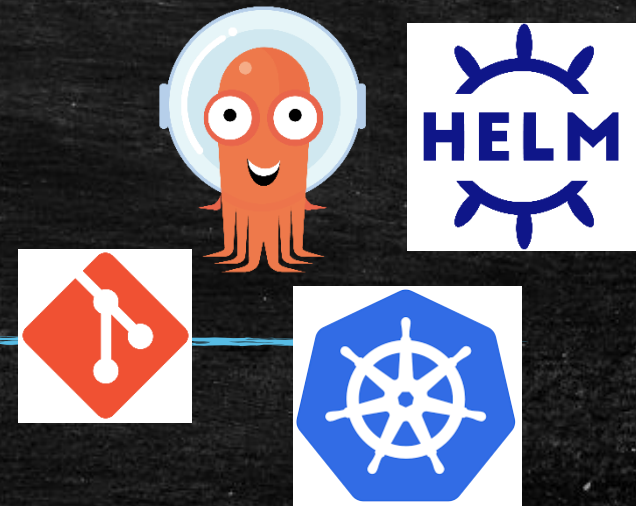
ArgoCD

- **Application**: Is a CRD defined and used by ArgoCD.
  - Describes an application to be configured declaratively
  - Configuration repository, path
  - Destination cluster, namespace
  - Sync policies, retries, …
  - Example: https://github.com/nirumand/gitops-demo-config/blob/main/advance-examples/applications/argoapp-webserver-prod.yaml

- **ArgoProj**: Is a CRD defined and used by ArgoCD.
  - Describes an Argo Project containing multiple applications
  - Configures Permissions, allowed namespaces, sync-windows, …
  - Example: https://github.com/nirumand/gitops-demo-config/blob/main/manifests/argo-projects.yaml

Demo

GitOps with ArgoCD

https://github.com/nirumand/gitops-demo-config

Any Questions?

Thanks for your time and attention!

Resources

- Demo Materials: https://github.com/nirumand/gitops-demo-config

- GitOps:
  - https://www.gitops.tech/
  - https://www.weave.works/technologies/gitops/

- ArgoCD: https://argo-cd.readthedocs.io/en/stable/

- CI/CD: https://www.redhat.com/en/topics/devops/what-is-ci-cd

- Helm: https://helm.sh/

- Kind: https://kind.sigs.k8s.io/docs/user/quick-start/