Kubernetes in DevOps Space

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Agenda

- K8S Introduction
- K8S Ecosystem
- Demo

Kubernetes/K8S Introduction

Why ? What ? How ?

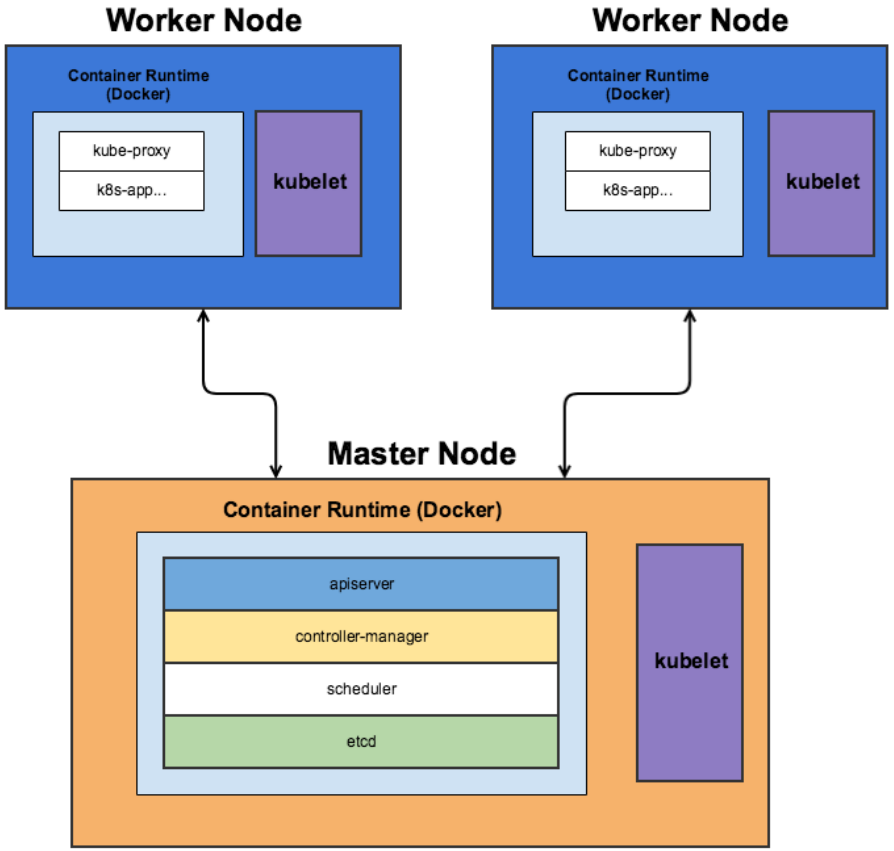
K8S - Why?

- ❑ Deploying
- ❑ Auto scaling
- ❑ Monitoring
- ❑ Logging
- ❑ API Gateway
- ❑ CI / CD
- ❑ …

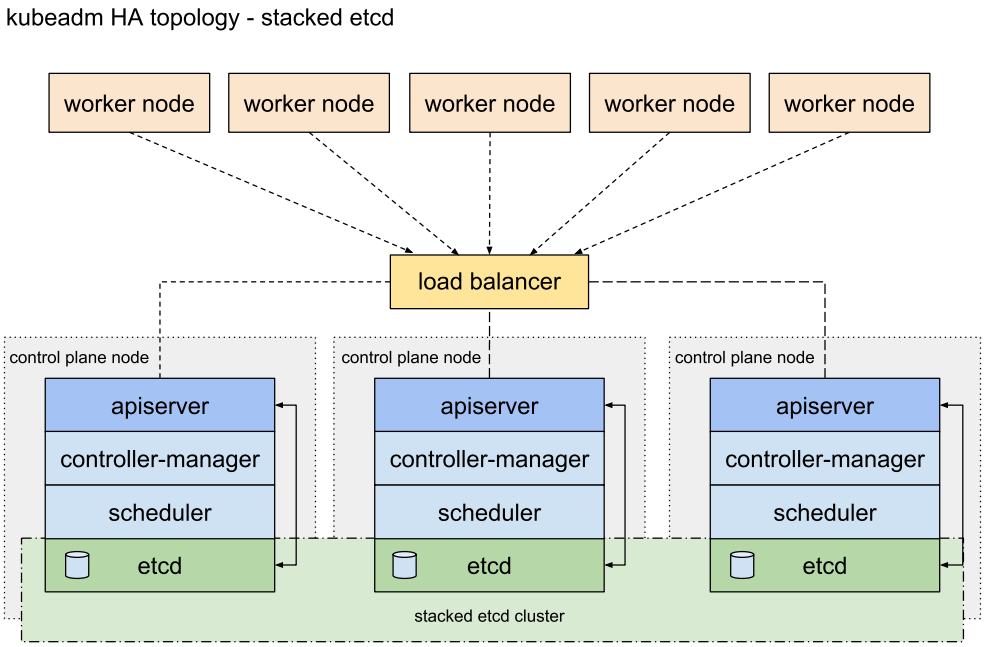
K8S - What?

- Orchestration & Platform
- Architecture
  - Infrastructure: Master & Worker Node + Addons
  - Application : Concepts / Components

K8S - Infrastructure



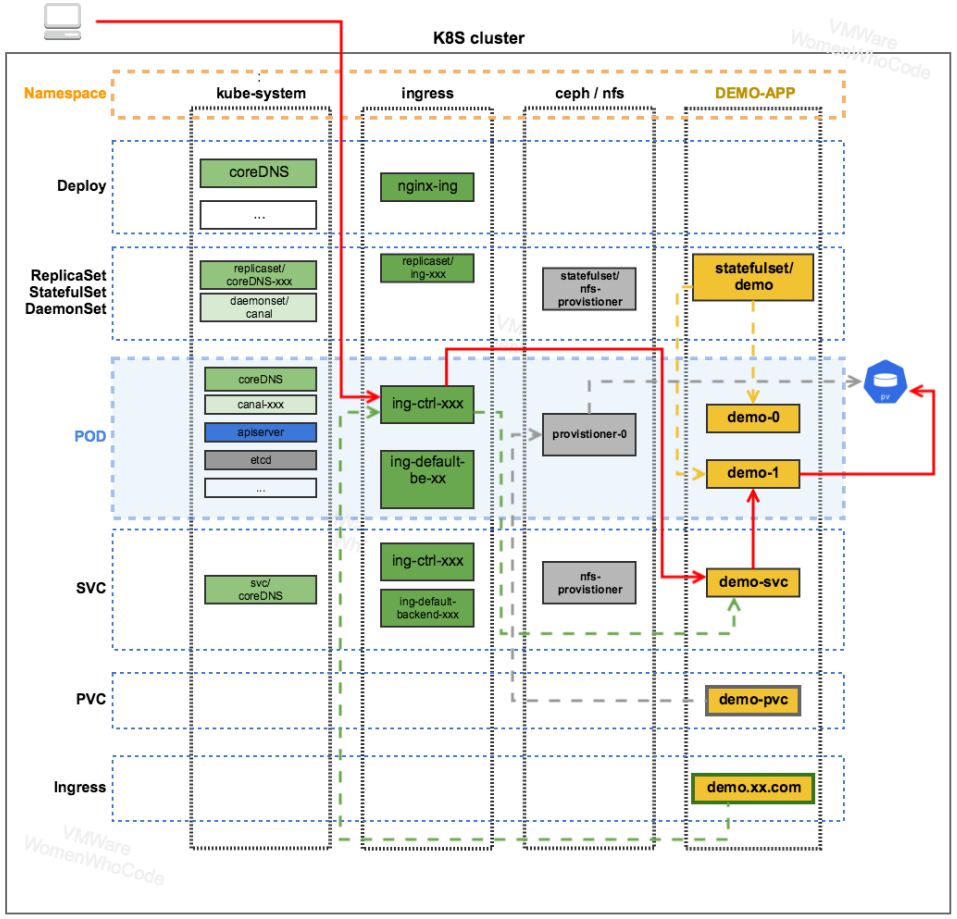
K8S - Infrastructure



K8S - Application

- Concepts:
  - Resource : **Namespace** / Resource Quota
  - Compute : **Pod** / ReplicaSet/ StatefulSet/ DaemonSet/ Deployment
  - Storage : **PV**/ PVC / StorageClass / ConfigMap / Secrect
  - Network : **Service** / Ingress

K8S - Application



K8S - How to use

- Cloud
  - AWS EKS
  - Azure AKS
  - Google GKE
  - Aliyun ACK
- On-Premise
  - Minikube / Docker Desktop
  - **Kubeadm**
  - SaltStack

K8S - Ecosystem

- CNCF (https://landscape.cncf.io/images/landscape.png)

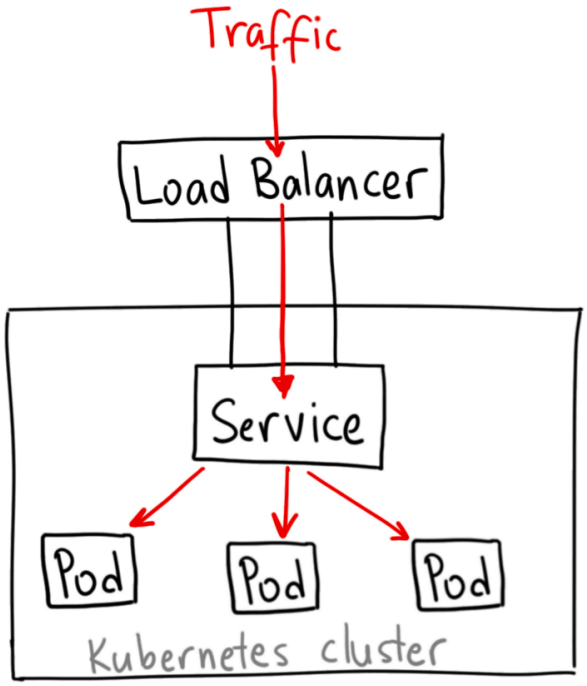
K8S Ecosystem

K8S Ecosystem

- Deploying
  - Service/Ingress
  - Helm
- Monitoring
  - Prometheus
  - Grafana
- Logging
  - Fluent-bit
  - Elasticsearch/ Kibana
- CI/CD
  - Jenkins
  - GitLab CI

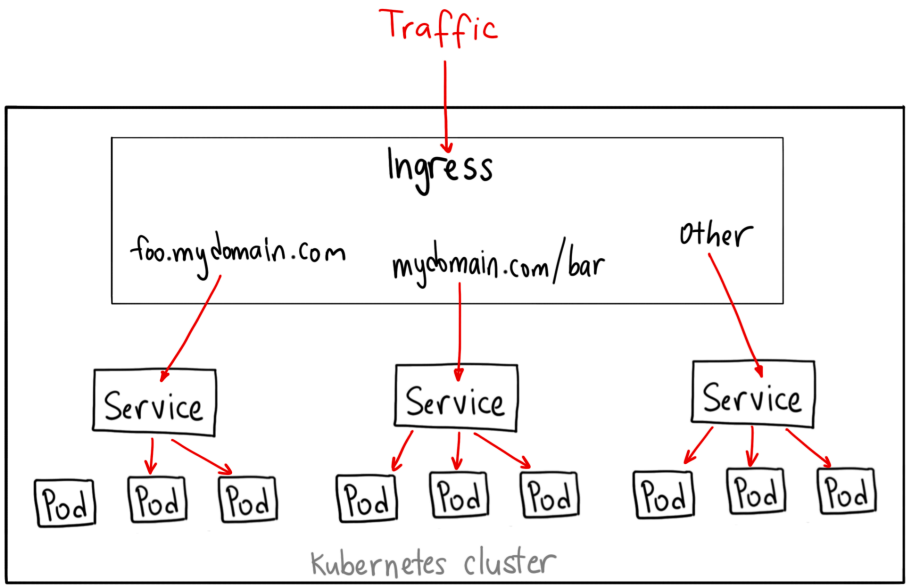
Deploying – Publishing Service

- ClusterIP
- NodePort
- LoadBalancer



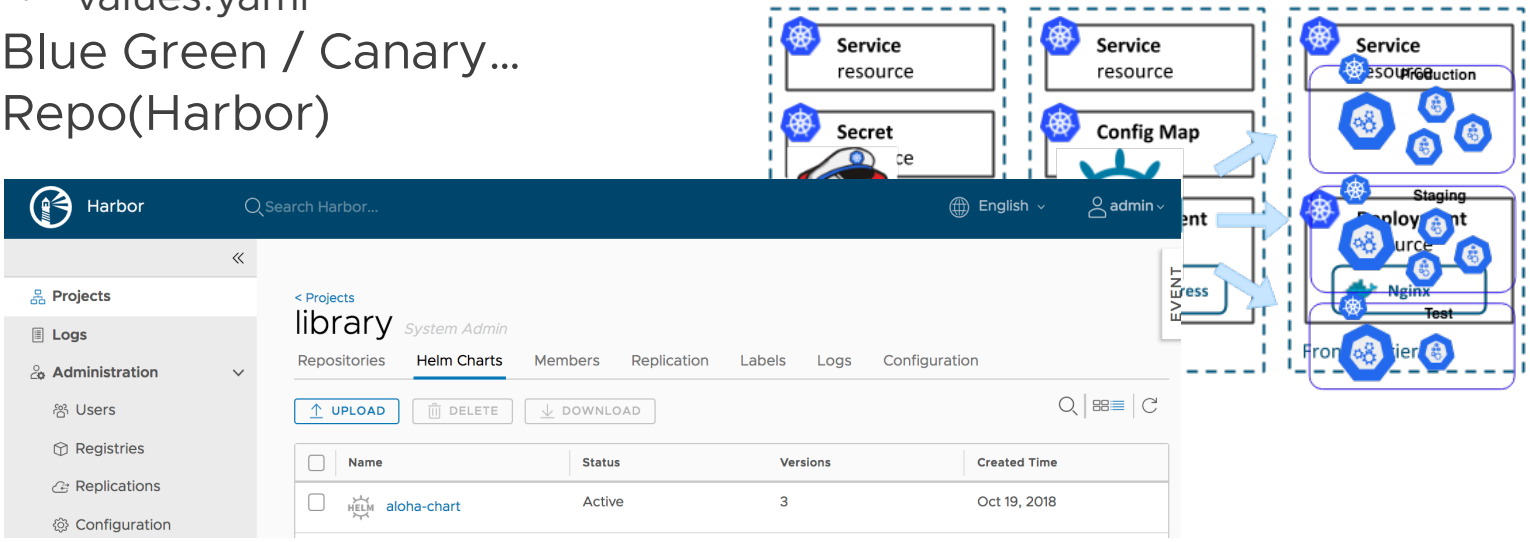
Deploying - Ingress

- ❑ Centralize services into a single entrypoint
- ❑ Path and subdomain based routing
- ❑ Ingress Controller/ Ingress Resource

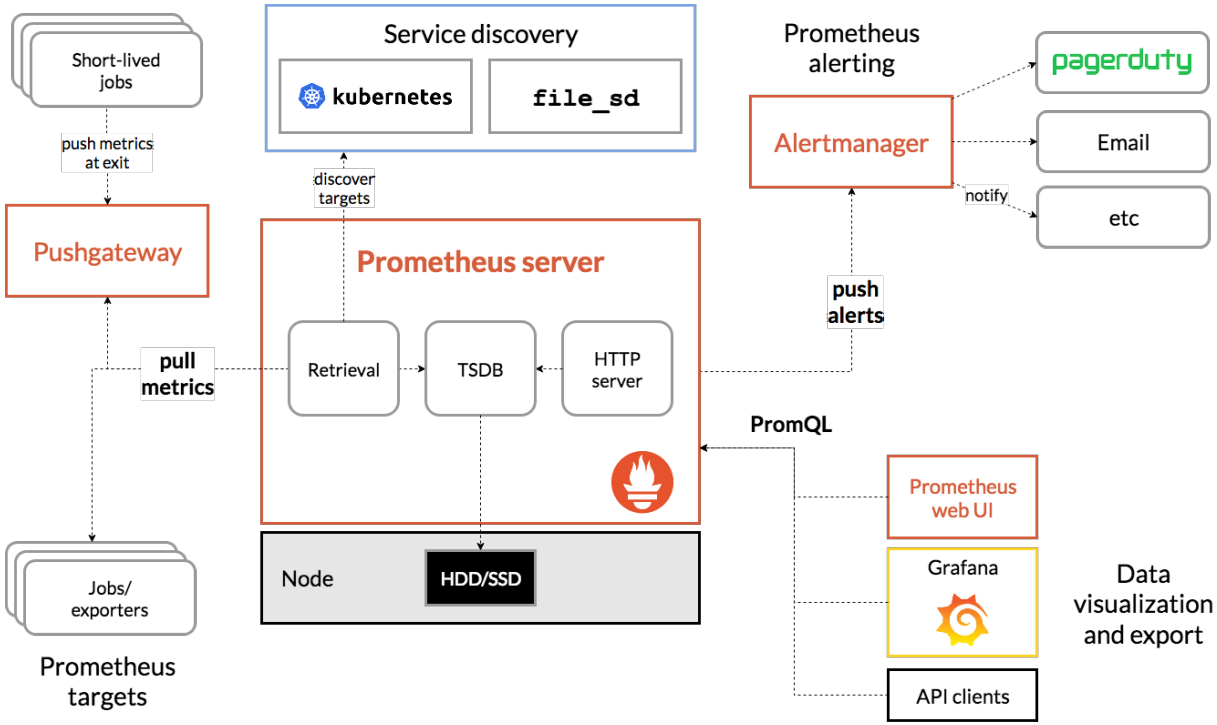


Deploying - Helm

- ❑ Package/ Configure/ Deploy
- ❑ Helm Chart
  - templates/
  - values.yaml
- ❑ Blue Green / Canary…
- ❑ Repo(Harbor)



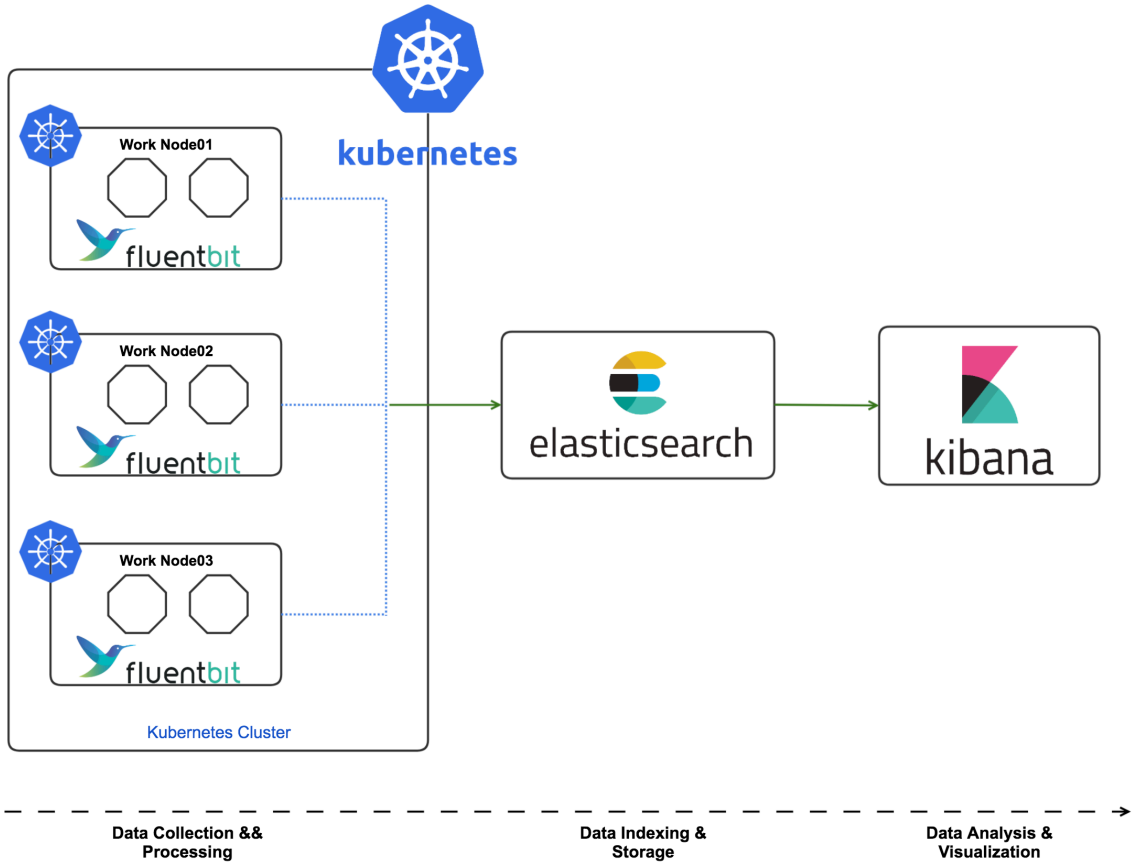
Monitoring - Prometheus



Monitoring - Grafana

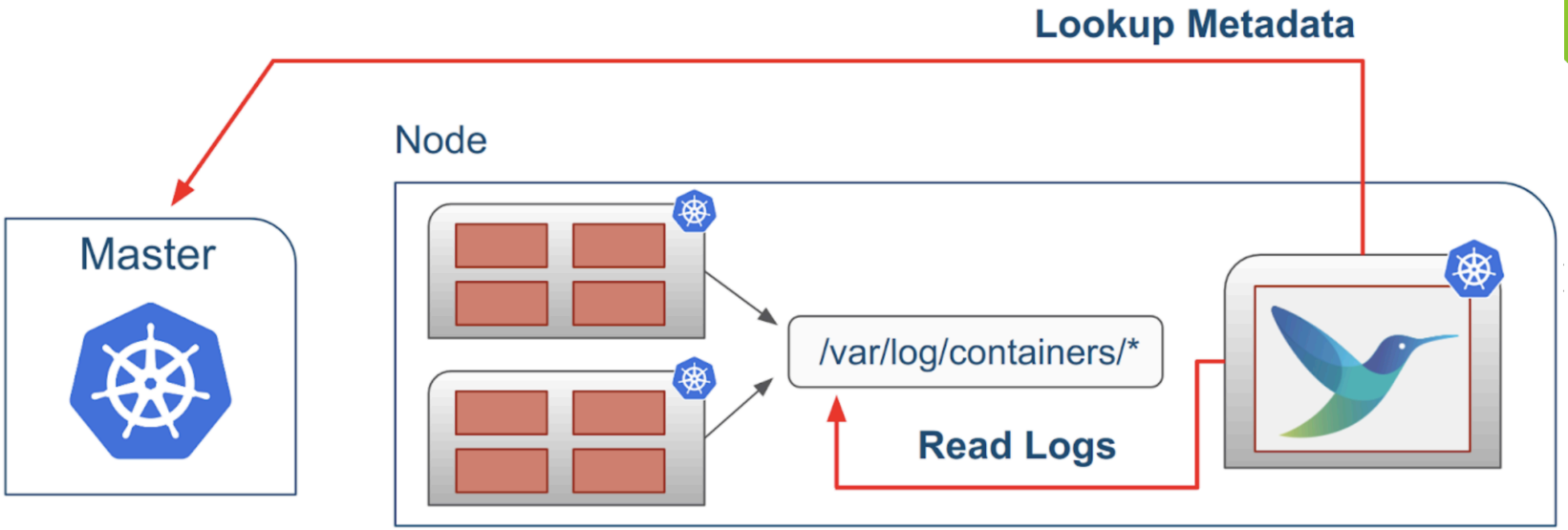
- ❑ Visualization
- ❑ Data source
- ❑ Dashboard

Logging - EFK


kubernetes
Work Node01
fluentbit
Work Node02
fluentbit
Work Node03
fluentbit
Kubernetes Cluster
elasticsearch
kibana
Data Collection && Processing
Data Indexing & Storage
Data Analysis & Visualization

Logging – Fluent-bit

- ❑ Support for Kubernetes Logging
- ❑ Daemon Set



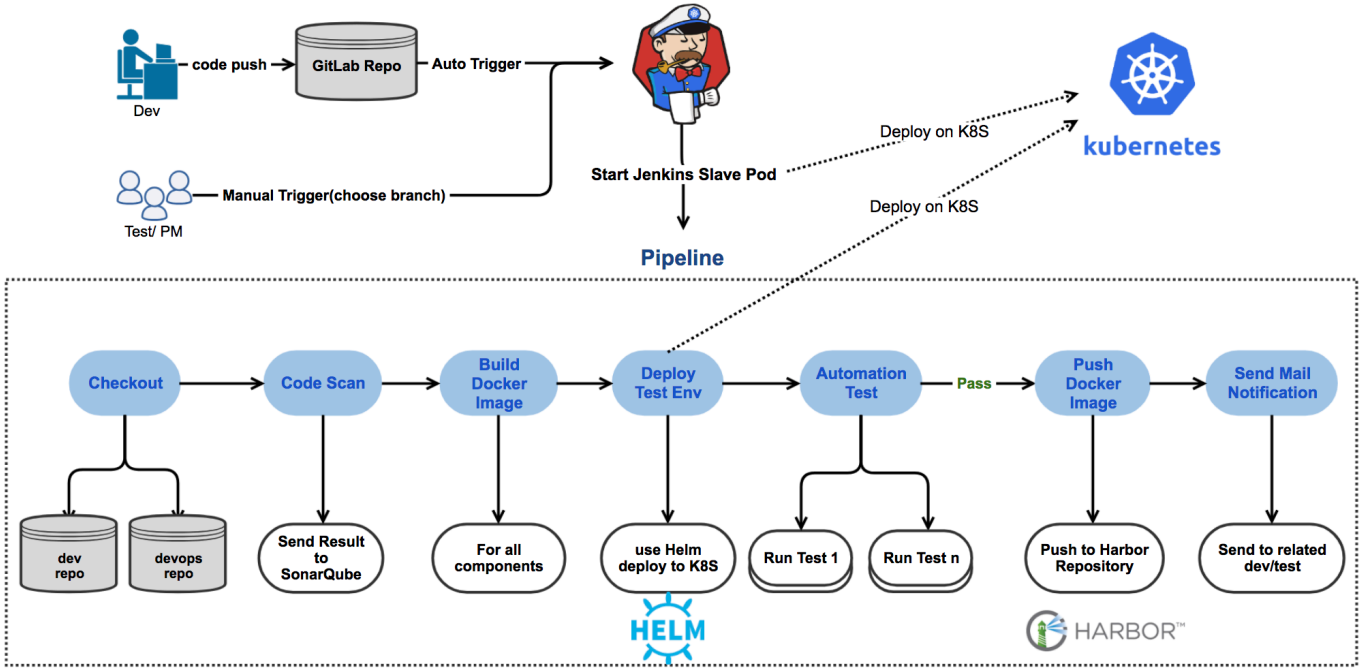
Logging – Configure

```
fluent-bit-input.conf: |
[INPUT]
    Name                tail
    Tag                 kube.*
    Path                /var/log/containers/*.log
    Parser              docker
    DB                  /var/log/flb_kube.db
    Mem_Buf_Limit       10MB
    Skip_Long_Lines     Off
    Refresh_Interval    3
    Docker_Mode         On

fluent-bit-filter.conf: |
[FILTER]
    Name                kubernetes
    Match               kube.*
    Kube_URL            https://kubernetes.default.svc.cluster.local:443
    Merge_Log           On
    Merge_Log_Key       Filter
    K8S-Logging.Parser  On
    K8S-Logging.Exclude On
    tls.verify          Off

fluent-bit-output.conf: |
[OUTPUT]
    Name                es
    Match               *
    Host                http://myelasticsearch_ip_or_domain
    Port                9200
    Logstash_Format     On
    Logstash_Prefix     kubernetes
    Logstash_DateFormat %Y.%m
    Include_Tag_Key     On
    tls                 Off
    tls.verify          Off

parsers_custom.conf: |
[PARSER]
    Name   nginx
    Format regex
    Regex ^(?<remote>[^ ]*) (?<host>[^ ]*) (?<user>[^ ]*) \[(?<time>[^\]]*)\] "(?<method>\S+)(?: +(?<path>[^\"]*?)(?: +\S*)?)?" (?<code>[^ ]*) (?<size>[^ ]*) \"(?<referer>[^\]]*)\" \"(?<agent>[^\]]*)\" .*?$
    Time_Key time
    Time_Format %d/%b/%Y:%H:%M:%S %z

[PARSER]
    Name        java-log
    Format      regex
    Regex       ^.*(?<time>\d{4}-\d{1,2}-\d{1,2} \d{1,2}:\d{1,2}:\d{1,2}.\d{1,3})\s+(?<level>[^\s]+)\s+--\s+\[(.*)\]\s+(?<class>.*)\s+:\s+(request=(?<request_id>\S+))?\s+(?<message>.*)
    Time_Key    time
    Time_Format %Y-%m-%d %H:%M:%S.%L
```

```
66      1555832060000
67    ]
68  }
```

CI/CD

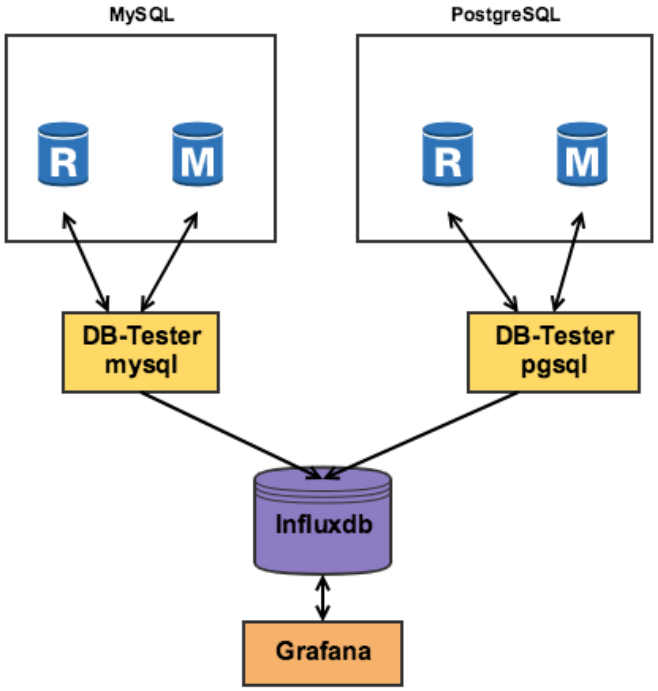
- ❑ Jenkins (GitLab CI)
- ❑ Integrate with K8S



Demo

Deploy DB-Tester App

- Helm Chart
  - pgsql-values.yaml
  - mysql-values.yaml



Thank you !