

Final Project Presentation

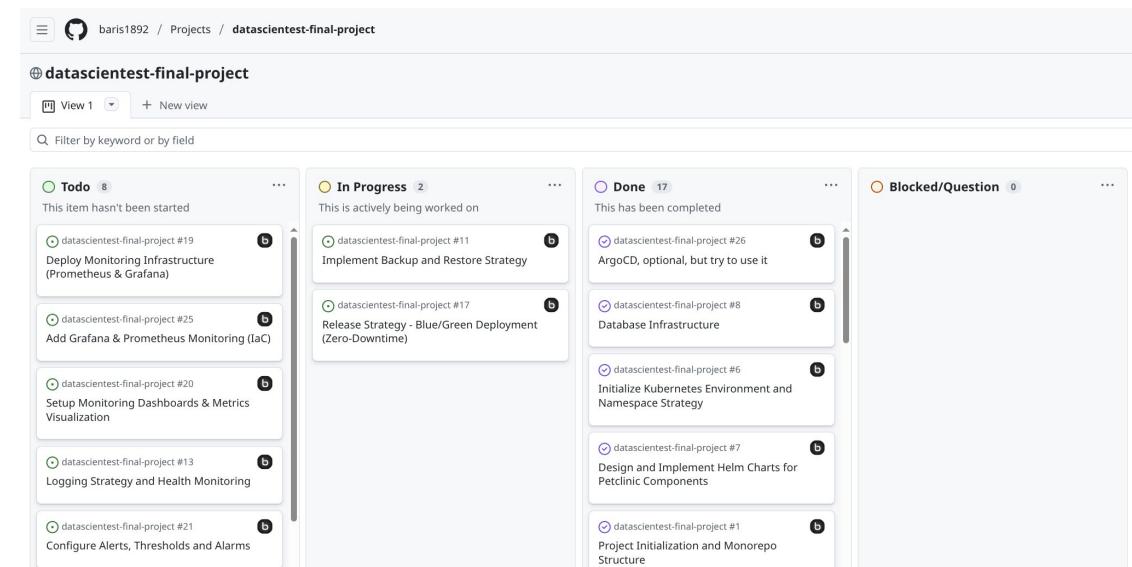
by Baris Top

Contents

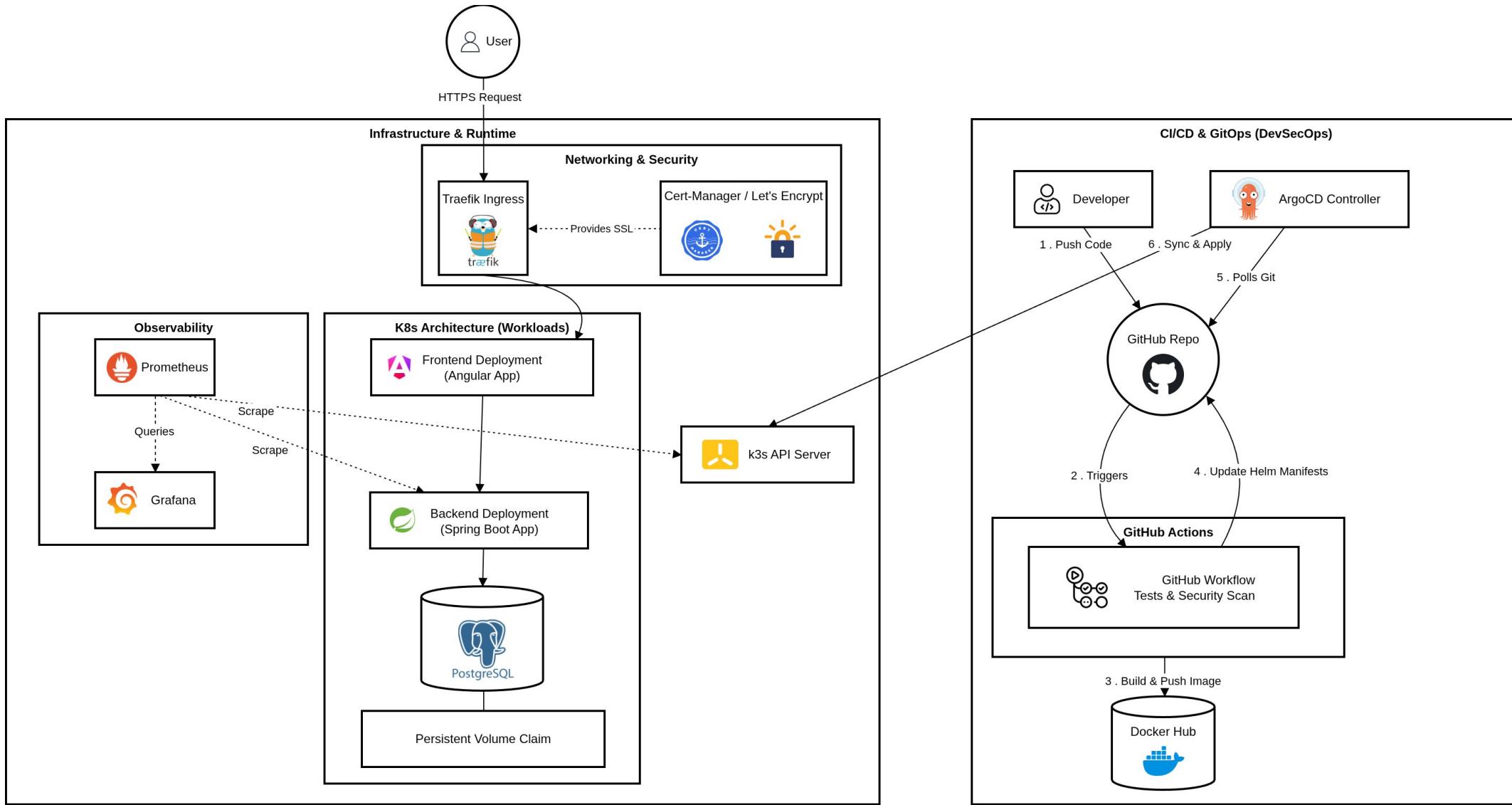
1. Overview of the App
2. Architecture Diagram
3. Tech Stack
4. Infrastructure Provisioning
5. How to deploy dev & prod
6. CI/CD Pipeline & DevSecOps
7. Resilience & Disaster Recovery

1. Overview of the App

- **Foundation:** Utilizing the Spring Petclinic as a baseline.
- **Core Components:** Separation of Angular Frontend, Spring Boot REST API, and a persistent PostgreSQL Database.
- **Key Objectives:** Operational efficiency, independent scalability, and full automation via CI/CD pipelines.
- **Project Management:** Managed with Agile/Kanban methodology using GitHub Issues and Project Boards.



2. Architecture Diagram

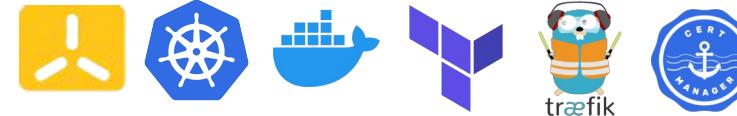


3. Tech Stack

- Application & Persistence:



- Infrastructure & IaC:



- Deployment & GitOps:



- Observability & Security:

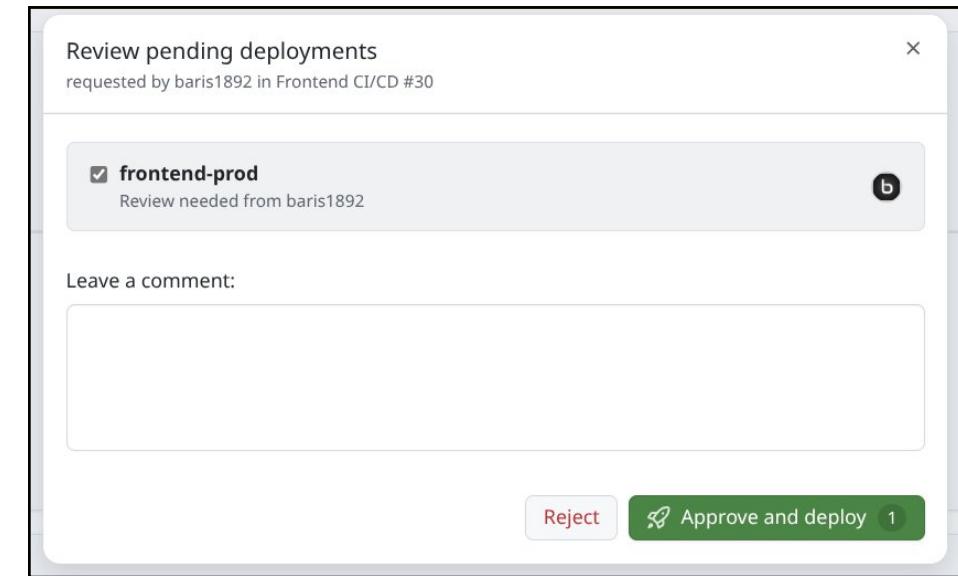


4. Infrastructure Provisioning

- **Automated Foundations:** Infrastructure as Code via Terraform for global services (Ingress, SSL, Monitoring).
- **Environment Setup:** Isolated namespaces and persistent databases for Dev & Prod.
- **GitOps (ArgoCD) Bootstrap:** Using the App-of-Apps pattern to trigger automatic synchronization of all services.

5. How to deploy dev & prod

- **Environment Isolation:** Strictly separated via Kubernetes Namespaces (dev & prod).
- **Dev Workflow (values-dev.yaml):** Continuous Deployment triggered by every push to the develop branch.
- **Prod Workflow (values-prod.yaml):** Continuous Delivery via Git Tags (e.g., v1.0.2) and Manual Approval.
- **Dynamic Config (FE, Angular):** Runtime API-URL injection via ConfigMaps (No re-builds required).



5. How to deploy dev & prod

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```
apiVersion: v1
kind: ConfigMap
metadata:
  name: {{ include "frontend.fullname" . }}-config
data:
  env.js: |
    window.__env = {
      REST_API_URL: "{{ .Values.env.REST_API_URL }}",
      ENV_NAME: "{{ .Values.env.ENV_NAME }}"
    };
# usage in deployment.yaml
spec:
  containers:
    - name: {{ .Chart.Name }}
      volumeMounts:
        - name: frontend-config
          mountPath: /usr/share/nginx/html/assets/env.js
          subPath: env.js
      volumes:
        - name: frontend-config
      configMap:
        name: {{ include "frontend.fullname" . }}-config
```

6. CI/CD Pipeline & DevSecOps

← Frontend CI/CD

⌚ Frontend CI/CD #30

Cancel workflow

...

Summary

Triggered via create 1 hour ago Status: Waiting Total duration: - Artifacts: -

baris1892 · 1b55f6c

baris1892 requested your review to deploy to **frontend-prod** Review deployments

frontend-ci-cd.yaml
on: create

```
graph LR; A[Run Unit Tests] -- "1m 33s" --> B[Snyk Dependency Scan]; B -- "22s" --> C[Build a... / build-and-push]; C -- "1m 55s" --> D[Prepare Release Metadata]; D -- "3s" --> E[Update Frontend Prod Manife...]; E -- "0s" --> F[Update Frontend Dev Manif...]; F -- "2m 6s" --> C;
```

Run details

Usage

Workflow file

Prepare Release Metadata summary

🚀 Production Release Pending

A new release is waiting for your approval.

Property	Value
Version	v0.0.10
Actor	baris1892
Commit	1b55f6c4d5c30beee9a924166201a03cd358b54f

7. Resilience & Disaster Recovery

- **Self-Healing:** Automatic container recovery via Liveness & Readiness probes.
- **Database Backups:** Daily automated pg_dump via Kubernetes CronJobs.
- **Infrastructure Recovery:** Full reconstruction using the layered Terraform & GitOps approach.
- **GitOps Rollback:** Instant version reversal by reverting commits in Git.

Demo

- Pipeline in Action
 - Adjust FE text
 - Adjust BE logs
- After Deployment
 - Check ArgoCD UI
 - Check Grafana Logs for adjusted BE logs
- Demonstrate Fault Tolerance & Alerting