Team 25 Project Charter
Vernal

Team Members: Winston Ngo, Dennis Pham, Hpung San Awng, Aaron Ni

Problem Statement

One of the most time-consuming tasks many organizations and developer teams face is having to deploy, scale, and manage applications in the cloud. Many teams find themselves having to sink a considerable amount of time into handling deployments and building the pipelines necessary to get their app into the cloud. It becomes even more complicated when an organization needs to ensure that all teams are following the same practices and standards. Vernal is designed with developers in mind, allowing them to seamlessly deploy their app from their own repository in just a few clicks. Although there are numerous existing services out there that let you quickly deploy your full-stack applications to the web, they also lack many other features that busy developers and organizations need. Vernal additionally provides the ability to perform tasks such as automated security and vulnerability scans, which is not a feature included in many existing solutions, as well as the ability to enable OIDC authentication for their application with just a few clicks, saving developers considerable time from having to implement their own solution for authentication.

Project Objectives

1. Create a platform-as-a-service (PaaS) designed to empower developers to seamlessly build, deploy, and scale their web applications in the cloud all from one easy-to-use, cohesive dashboard
2. Create a standardized workflow for app deployment and allow users to easily follow these established workflows
3. Allow users to view performance metrics from their app such as CPU and memory usage, requests, and errors.
4. Perform security scans and view vulnerability reports for each app
5. Provide the ability to quickly enable OIDC authentication for users' applications

<u>Stretch Goals/Objectives</u>

6. Create a social media space for developers to create and interact with other posts about new ideas, projects, and help.

Stakeholders

Users: Developers who want to quickly build, deploy, and scale their web applications
Developers: Aaron Ni, Winston Ngo, Dennis Pham, Hpung San Awng
Project Coordinator: Yufeng Qian
Project Owners: Aaron Ni, Winston Ngo, Dennis Pham, Hpung San Awng

Deliverables

- A React frontend built into Backstage that allows users to create, deploy, scale, secure, monitor, observe, and improve their full-stack web applications
    - Create full-stack web applications from pre-defined templates of popular tech stacks
    - Deploy production applications and databases to our Kubernetes clusters
    - Scale up and down dynamically to accommodate for high/low traffic
    - Secure applications with security scans and vulnerability reports, as well as the ability to enable OIDC authentication with one click
    - Monitor resource usage and health with graph dashboard and logging
    - Observe incoming network traffic to applications and databases
    - Improve performance, accessibility, and SEO with insights from integrated Lighthouse audits
- A backend built into Backstage that will power the entire platform with its API
- Manifests for a cloud-agnostic, bootstrapped Kubernetes cluster with all necessary components to deploy our entire production stack, including Vernal, Argo CD, Crossplane, Istio, Kiali, Loki, Alertmanager, Blackbox Exporter, Grafana, Kube State Metrics, Node Exporter, Prometheus, Reflector, Sealed Secrets