Application Hosting and Deployment using Container Orchestration (EKS)

Product Overview

In order to deliver high-quality experiences for U.S Veterans interacting with the Veterans Affair (VA) through various Veteran Facing Services (VFS) on the Veteran Services Platform (VSP), development and engineering teams need the ability to provision, host, and deploy software applications in a way that is automated, reliable, scalable, and secure.

Key Features & Benefits

- Gives developers the ability to provision and deploy containerized applications
- Offers developers greater autonomy in the delivery of digital services to Veterans
- Makes it easier to onboard new applications and services on the platform
- Accelerates the software development lifecycle by reducing time-to-veterans *(TTV; ie the time it takes from conception to delivery of a digital service to the platform's customers)*
- Makes it easier to configure how services work in various environments
- Tightly integrated with the platform's observability tools *(incl. logging, monitoring, alerting, and error reporting)*
- Allows developers to provision compute, network, and storage resources at a higher level of abstraction, enabling them to focus on application/business logic rather than infrastructure management
- Simplifies the development experience by providing networking, redundancy, high availability, and scalability for applications and services without the need for development teams to manage the underlying infrastructure components

Key Personas

- Application Developers
- Platform Developers

Problem Statement

Due to the design and architecture of the platform's legacy Build, Release, Deploy (BRD) infrastructure, there is a lack of self-service options and capabilities for developers, and a heavy reliance on the Platform Operations team to get new projects up and running. Additionally, a mix of older technologies and "brittle" components make it challenging to improve the existing applications, services, and infrastructure.

Existing Pain Points & Limitations

- Development teams rely heavily on Platform Operations, impeding their ability to easily deploy applications and services on the platform on their own
- The current complexity limits the flexibility to try new things, experiment, and iterate rapidly
- Infrastructure, applications, and services are difficult to manage, scale, and support

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Measuring Success

Key Performance Indicators (KPIs)

- Increase in developer satisfaction with application hosting and deployment on the platform
- Decrease in the amount of time it takes for developers to bring up a *new* application or service
- Decrease in the amount of support required for launching *new* applications and services
- Decrease in the amount of support required for updating *existing* applications and services

Baseline KPI Values

- Baseline values for those most critical metrics (TBD)

Assumptions

- The solution will be based on Amazon's Elastic Kubernetes Service (EKS)
- Containerized applications will be deployed and hosted in Kubernetes clusters that are segregated by the intended usage and audience for a given group of applications or services
- Cluster design and implementation will be managed by the Platform Operations team

- The Platform Operations team will provide baseline configuration templates and examples, and developers will customize according to their needs

Solution Approach

The VSP Operations team will implement Amazon's (AWS) Elastic Kubernetes Service (EKS). Kubernetes leverages open-source software tools, supported by a strong community, and is commonly referred to as the "gold standard" in Container Orchestration.

- Open-source solution built on the Platform's cloud-based infrastructure hosted in the AWS GovCloud
- Provides scalability, high availability, and security for hosted applications and services in a way that streamlines developer operations
- Kubernetes is widely supported, and tightly integrated with other tools that are used for building, testing, deploying, and maintaining containerized applications
- Additional tools will be integrated with Kubernetes to enhance the developer workflow and provide a more user-friendly interaction with the platform's infrastructure

Solution Design

Link Container Orchestration Design Doc here

Launch Dates

- Live for Platform Operations utilities Mid-2021
- Ready for VFS projects early 2022

Reference Material

- Amazon Elastic Kubernetes Service (EKS) - "The most trusted way to run Kubernetes"
- Platform Demo - Container Orchestration explainer presentation

Communications

- Team Name: VSP Operations
- GitHub Label: operations
- Slack channel: #vsp-operations
- Product POCs:
    - Jesse House - Product Manager for VSP Operations (Ad Hoc)
    - Demian Ginther - Engineering Lead for VSP Operations (Ad Hoc)

Stakeholders

Product Owner: Mike Chelen

Platform Crew Chief: Rachael Roueche