FAST, SCALABLE AND SECURE
APPLICATION DEPLOYMENT INFRASTRUCTURE

Summary

The customer had a need for fast, scalable, and secure deployments of new applications using container orchestration, while integrating with existing tooling and environments.

Corporation Type: Telecommunications
Industry/Sector: Technology
Project Type: Implement container orchestration
Technology Used: Kubernetes, Amazon Web Services, Terraform

Project Requirements

- Stand up secure and scalable Kubernetes clusters in five VPC environments (development/test/staging/production/shared).
- Support Kafka Connect developers in utilizing Kubernetes.
- Support developers in deploying their apps and integrating with CI/CD.
- Support operations in managing Kubernetes clusters.
- Integrate Kubernetes clusters and applications with centralized metrics and logging solution.

The Solution

- Use Amazon EKS (Elastic Kubernetes Service) to manage Kubernetes control plane
- Use Terraform to manage AWS resources (VPCs, EKS clusters, EKS worker groups, etc.)
- Use Kustomize to customize common Kubernetes manifests per-environment
- Use ArgoCD to synchronize Kubernetes resources with manifests and Kustomizations in Git repos ("GitOps" workflow).
- Use RBAC linked to AWS SSO for user authentication.
- Use NGINX Ingress controllers with TLS termination to expose services securely.
- Use WeaveNet CNI plugin to reduce use of VPC subnet IP addresses and encrypt all traffic within the cluster to close the loop on end-to-end encryption.
- Deploy DataDog agent to stream logs and metrics to existing DataDog instance.
- Deploy Kafka Connect clusters.
- Create self-managed namespaces for Kafka developers, allowing each to easily deploy their own Kafka Connect clusters.
- Integrate continuous deployment with Jenkins CI, Octopus Deploy, and Azure DevOps.
- Use Amazon ECR (Elastic Container Registry) to store Docker images.
- Use EBS (Elastic Block Store) and EFS (Elastic FileSystem) for persistent storage.

- Provide documentation and walkthroughs to hand management of the solution over to customer's operations staff.

New challenges for FP Complete

- Working with Kustomize (we had previously used Helm)
- Integrating with Datadog
- Deploying and managing Kafka Connect
- Integrating with Octopus Deploy
- Using ArgoCD

Conclusion

Using out long-time experience with cloud and container orchestration technologies, we put the customer on a solid, modern footing to deliver applications efficiently and securely by leveraging cloud and open source technologies while integrating with their existing environment.