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Kubernetes Projects Delivered for Dubber Pty Limited, Melbourne (www.dubber.net)

Project Challenges

Dubber AI (Zoe AI Application)

- This is the core Dubber AI Engine and it runs on Hybrid Cloud.
- The AI engine runs on AWS, IBM Watson and Google Cloud and uses its various services such as Cognitive, Transcription, Translation, Speech Recognition, Personation, and Sentiment Analyzer, etc.,
- The challenge is providing a solution where we need to run an AI engine or an application as Cloud Agnostic Infrastructure.

Dubber Connect (Dubber Subscription Services)

- This is the Dubber Connect subscription-based portal for customers with high throughput read and write happening at Kubernetes clusters and then on Aurora RDS.
- In the year 2017, I had developed to run on a docker swarm-based solution and tasked to convert it to K8s based tech stack.
- The challenge is providing the solution for the application with zero downtime, so we need to implement canary deployments based on Kubernetes.

Global CDR (Dubber Billing Services)

- This is the entire Dubber platform Billing services across all US, UK, AUS.
- Running on Docker Swarm setup.
- Tasked to migrate to K8s based setup. The application runs every 5 minutes and runs reports.
- The challenge is providing the k8s based job/cron job-based solution and automate it.

Dubber Portal (Front Portal for Customer)

- Biggest Tech Stack involving Elasticsearch clusters, pgbouncers, Redis servers, and mongo dB servers.
- Currently running on AWS EC2 servers and with heavy workloads.
- Tasked to run/migrate on Managed AWS EKS or GKE Kubernetes, currently in progress.

High-Level Solution and Services delivered by me

- I chose to use Cloud-Native Kubernetes(K8s) architecture and currently manage more than 50 + Cloud-native k8s clusters, 500+ namespaces. Completely build and administrate them. Clusters are deployed on non-prod accounts and prod accounts.
- I started to build Kops based Cloud Native K8s based infrastructure on AWS from scratch.
- In parallel, I make sure that we have required AI services available at IBM Watson, GCP, and Azure. I have made sure that everything is templated using Terraform.

For Workloads,

- I have written helm charts, helmsman for easy deployments.
- At first, we used EKF Stack for better Logging, then we used Prometheus and Grafana for better Observability and finally I built Open tracing/Jaeger for better tracing.
- Added, Valero for k8s backups and HashiCorp vault for managing secrets and sealed secrets.

- Added KeyCloak as an Identity provider completely running as a separate workload in k8s and integrated with Google OIDC and Let's encrypt cert-manager for managing certificates.
- Better Nginx Ingress controller management using helm charts and scripts were written to connect to different domains.
- For Application based workloads, I have written the application-centric helm charts with appropriate deployment, services, controllers, etc., so that we can ease the rollout of applications in K8s infrastructure.
- Appropriate endpoints were used on Kubernetes clusters to connect to AWS Aurora RDS.

For CI/CD,

- Created the Jenkins based CI CD pipeline for Devs so that they can release the code build with just a click of a button on K8s infra.
- Write the CircleCI Yaml files to integrate and build application code and trigger the build to docker hub.

For Service Mesh, GitOps, and Serverless,

- Developed helm based Istio (service mesh) as a front end for better visibility of Kubernetes services.
- Developed GitOps based Argo CD architecture for continuous development.
- Developed serverless (Kubeless) Infrastructure as a POC to run the Dubber AI services.

For Kubernetes security,

- Developed appropriate RBAC policies, Cluster Rolebinding, Pod Rolebinding for Kubernetes clusters. Used the tool rback for visualizing RBAC policies.
- Developed and Implemented kubeaudit, kube2iam, Kube-bench as per Kubernetes cybersecurity policies on k8s cluster.

For Documentation,

- Developed source-control, hugo based documentation where other junior devops can easily follow and update the documents whenever needed.

Impact

- Better release timelines, Easy one Click development for developers.
- Better high availability, scaling, and resilient designs based on Kubernetes.
- Better security policies in place and easily visualized running on K8s.
- Better CI CD Architecture and pipeline workflow for entire developers, testers and DevOps.