DevOps Infrastructure Overview

Cloud Platform: Google Cloud Platform (GCP)

Key Components:

- External Load Balancer
- Cloud Armor (Web Application Firewall)
- Cloud CDN
- Kubernetes Cluster (multi-zone)
- Cloud SQL (PostgreSQL)
- MongoDB Clusters
- Cloud Storage Buckets
- VPC Network
- Cloud Run (limited use)

Kubernetes Cluster:

- Multi-zone deployment (Europe West 2 a, b, c)
- Control plane in Europe East
- Two node pools: general-purpose and ML-specific with GPUs
- No node affinity or taints/tolerations configured

Database Infrastructure:

- PostgreSQL: 7-8 instances, main instance is highly available
- MongoDB: 6-7 deployments, production uses 3-node clusters
- Redis: Managed by Google Cloud Memorystore

Deployment and Infrastructure Management:

- Terraform for infrastructure as code
- Ansible for MongoDB cluster configuration
- Atlantis for Terraform plan/apply automation
- Monorepo structure for infrastructure code (considering modularization)

Networking:

- VPC with auto-subnet creation
- VPN for staging environment access

Monitoring and Observability:

- Prometheus, Grafana, Elasticsearch
- Datadog

Data Infrastructure:

- BigQuery as data warehouse

- Airflow for data pipeline orchestration
- DBT for data transformation
- Looker and Holistics for reporting

Key Challenges and Improvements:

1. Modularize Terraform code into smaller repositories
2. Implement proper DevOps workflow with Atlantis
3. Address VPC peering issues for production VPN access
4. Prepare for multi-region deployment requirements
5. Optimize Terraform apply times due to large number of resources
6. Improve service account and access management
7. Enhance MongoDB cluster creation process
8. Streamline DevOps request handling and ticketing

Best Practices:

1. Use Terraform for infrastructure management
2. Leverage GCP's native Kubernetes integration
3. Implement proper access control and service account management
4. Utilize managed services when possible (e.g., Cloud SQL, Memorystore)
5. Maintain clear documentation and diagrams of infrastructure
6. Regularly review and optimize cloud resource usage
7. Implement proper monitoring and alerting
8. Follow GitOps principles for infrastructure changes

This document provides a high-level overview of the current DevOps infrastructure and highlights key areas for improvement and best practices to follow.