Gen3 CSOC WG Meeting

January 29, 2025

The Agenda

- Presentation by Australian BioCommons on deployment
- Update from CTDS on CSOC development
- Open Discussion
- AOB

Guerdon Mukama

Cloud Application Developer, Australian BioCommons

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Gen3 Deployment with AWS CDK Infrastructure Pipelines

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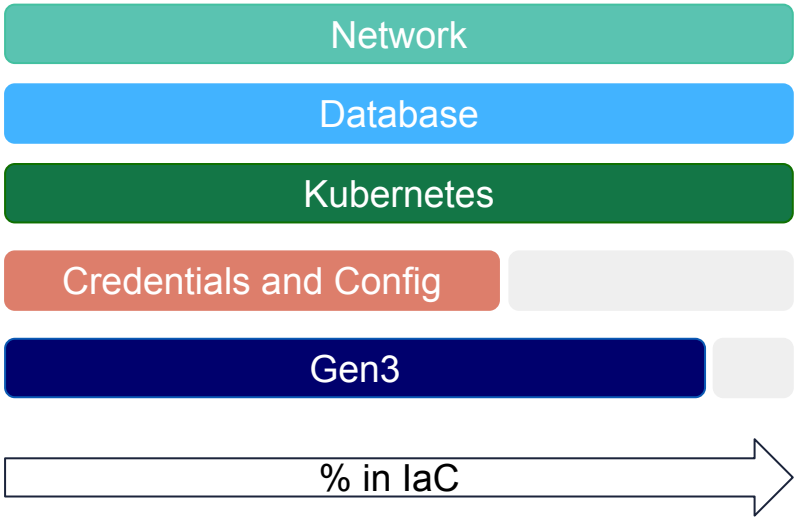
- Introduction
- Pipelines Architecture Overview
- Deployment Flow
- Getting Started
- Benefits & Takeaways
- Q&A

Introduction: Current State



- 90% of the our Gen3 deployment is by infrastructure pipelines
- Credentials and configuration still needs improvement

Introduction: Infrastructure as Code (IaC)

Why use it?

- IaC allows infrastructure to be defined, versioned, and deployed as code.
- Eliminates manual configuration, ensuring consistency across environments.
- Enables automation, reducing deployment errors and improving scalability.

Introduction: Why we use IaC

Challenges

- Multiple environments deployments (dev, stg, prod)
- Dependencies deployments (network, databases)

Solution

- Leverage AWS CDK
- Adopt GitOps

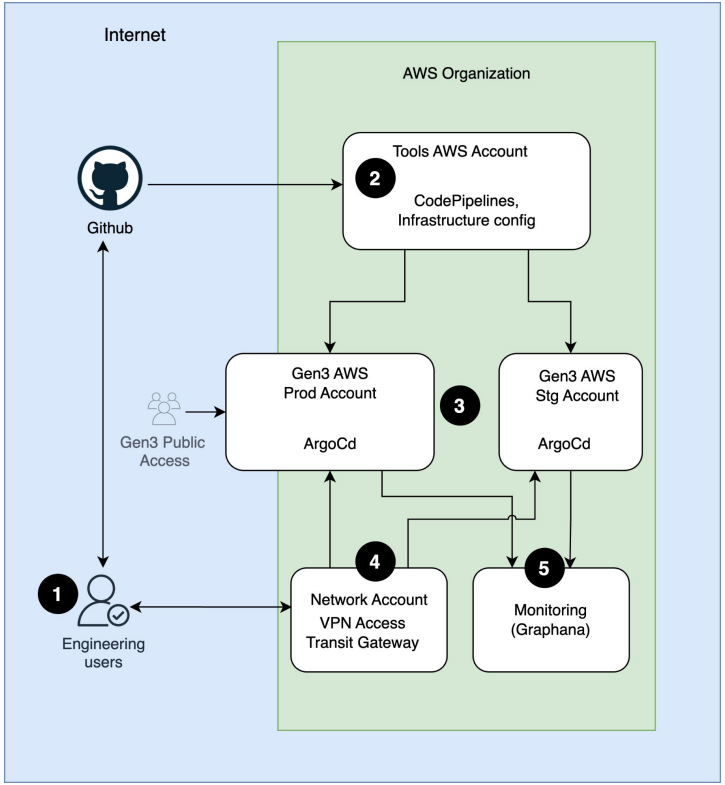
Outcome

- Scalable and consistent deployments
- Reduced manual effort and errors
- Infrastructure changes are traceable through GitOps

Pipelines Architecture Overview

Multi Account Strategy

- Tools
- Workloads
- Monitoring
- Networking



- Isolation of workloads for security and compliance.
- Prevents resource contention between environments.
- Enables least-privilege IAM policies for better security management.

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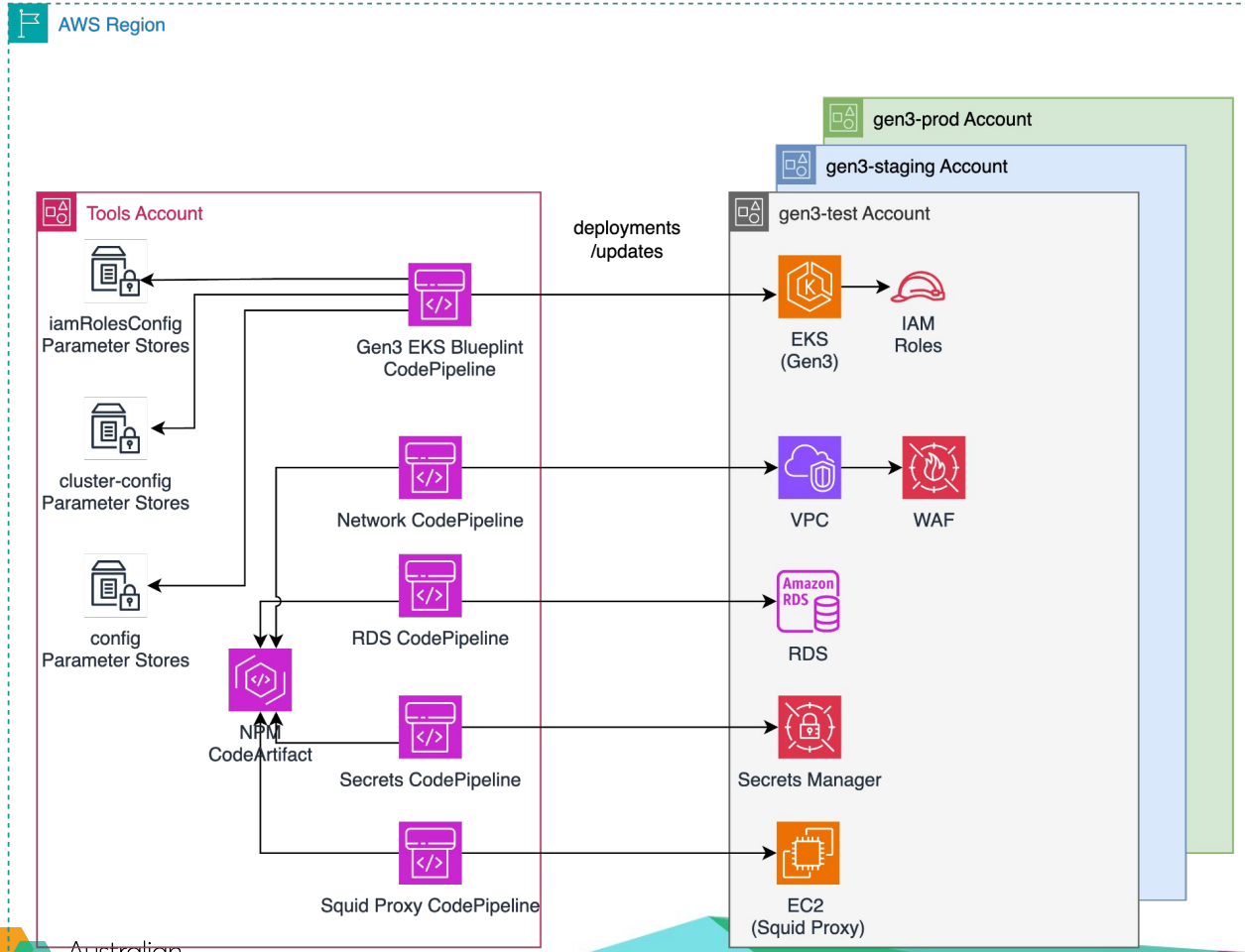
Tools account



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Pipelines Architecture Overview

AWS CDK and IaC

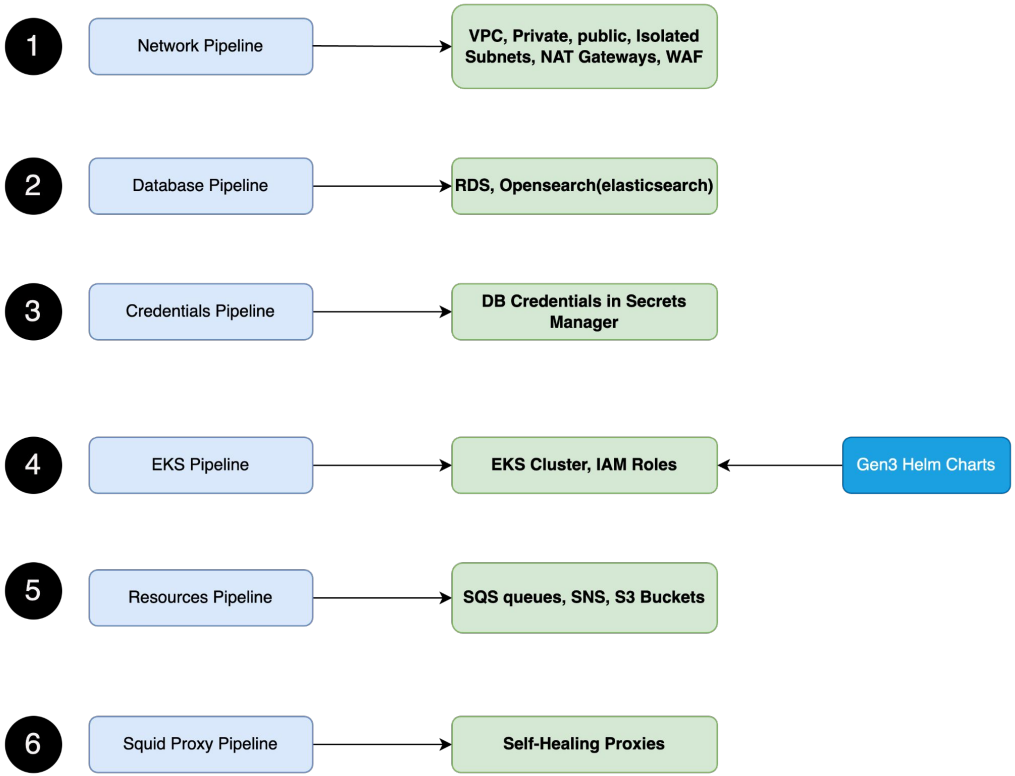
Infrastructure as Code with AWS CDK

- Reproducibility and version controlled changes
- Leverage AWS EKS Blueprints
- Handles Complex requirements (Custom resources)

GitOps for Deployment Workflows

- Single source of truth
- Changes are trackable and auditable
- Reduces human errors

Deployment Flow: Deployment Order



Current public Repos…

- Gen3 EKS Pipeline Repo
- Gen3 Workloads Repos

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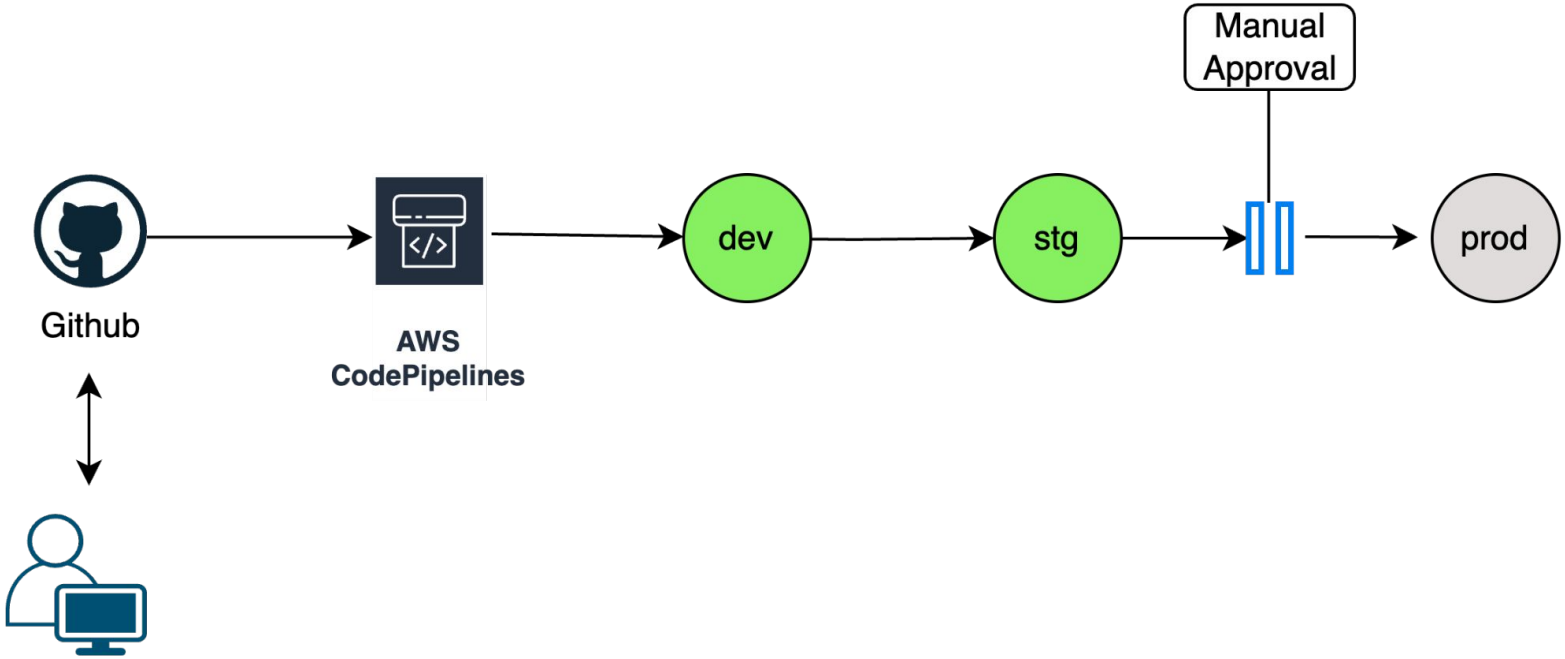
Deployment Flow

Deployment example

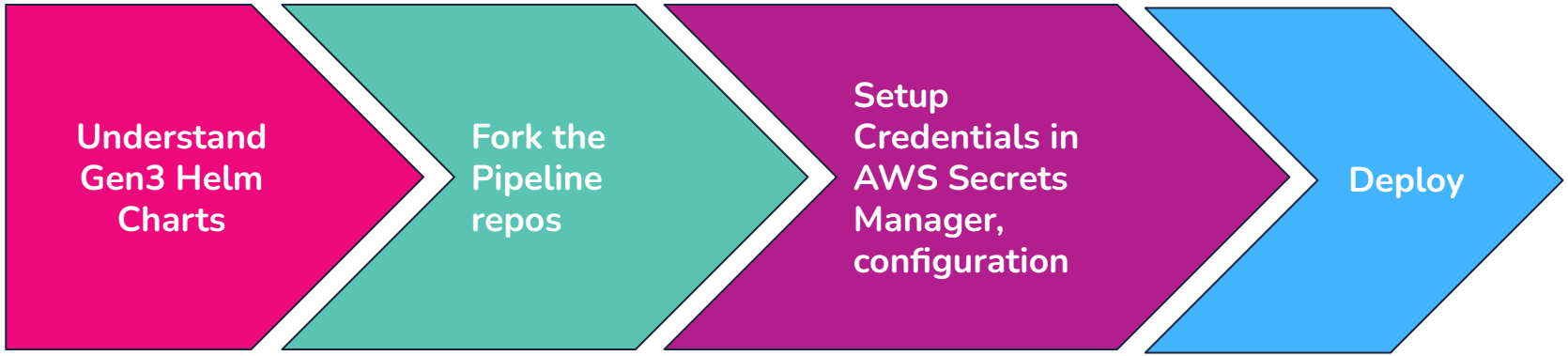


Quick Start Deployment (EKS Cluster)

What you need to provide:

- VPC with private and public subnets (One can be created for you)
- Database Service
- Credentials in AWS Secrets Manager

Quick Start Deployment



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Cloud Automation Comparison

Gen3 Deployment with AWS CDK Pipelines

- No need of Management VM
- CI/CD integration with AWS services
- Simplified IaC with AWS CDK
- Error reduction and observability
- Scalability and flexibility
- Multi-Cloud not supported

Cloud Automation

- Management VM Dependency
- Manual steps for Multi-Environment deployment
- Limited Automation
- Restricted ecosystem when deployed in AWS

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- Reproducibility
- Version Control
- Maintainability

Benefits and Takeaways

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Questions?

Resources

- Gen3 Helm Charts
- Gen EKS Pipeline
- Gen3 workloads repo example