

# The road to containerization



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# What is this about?

- ▶ About me
  - DevOps engineer for Global App Testing since 2016
  - IT professional since 2011
  - First time event speaker
- ▶ About this presentation
  - Quick introduction
  - Technology stack
  - The migration talk
- ▶ Things are moving fast!

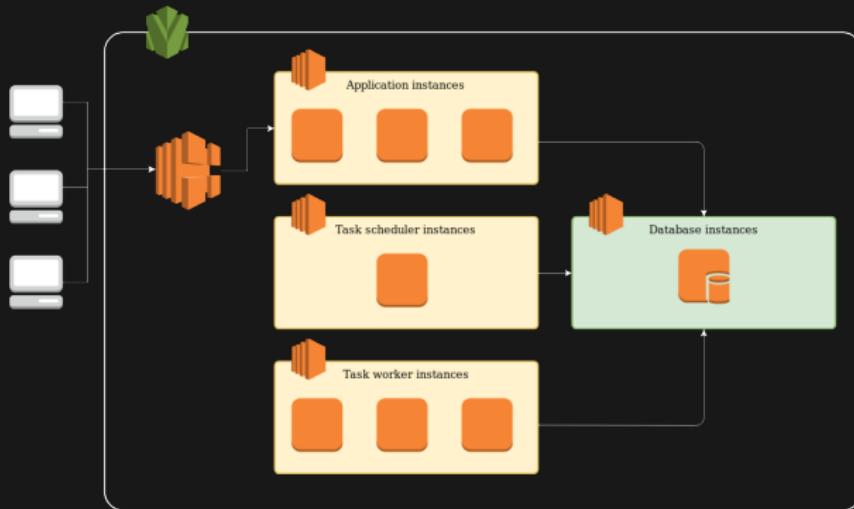


# Ancient history



# GAT infrastructure

The year is 2016



# GAT infrastructure

Pain points explained

- ▶ Long deployment times



# GAT infrastructure

Pain points explained

- ▶ Long deployment times
- ▶ Uncertainty of success



# GAT infrastructure

Pain points explained

- ▶ Long deployment times
- ▶ Uncertainty of success
- ▶ Deployments caused downtime



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- ▶ Deployments caused downtime
- ▶ High cost



# GAT infrastructure

Pain points explained

- ▶ Long deployment times
- ▶ Uncertainty of success
- ▶ Deployments caused downtime
- ▶ High cost
- ▶ Not automated



# Gat infrastructure

What next?

- ▶ Improve existing infrastructure
  - Vendor lock-in
- ▶ Move to containers
  - Save money
  - Lessen configuration complexity
  - Play with shiny new tools



# The container landscape



# Docker



- ▶ Container platform
- ▶ Lightweight VMs
- ▶ Packaging format
  - Reproducible deployments



# Kubernetes



- ▶ Container orchestration
- ▶ Service discovery
- ▶ Persistent storage
- ▶ High availability



# Helm



- ▶ Package manager
- ▶ Configuration management
  - Provides templates
- ▶ Deployment management



# Migrating to Kubernetes



# Moving to Kubernetes on GKE

Why there?

- ▶ Automated cluster deployment
- ▶ Management by Google
- ▶ Built in goodies:
  - Integrated authentication
  - Centralized logging
  - Cluster monitoring
  - Container registry



# Moving to Kubernetes on GKE

The journey

- ▶ Docker images for applications
- ▶ CI pipeline modification
- ▶ Helm instead of Chef
  - Change configuration generation



# Moving to Kubernetes on GKE

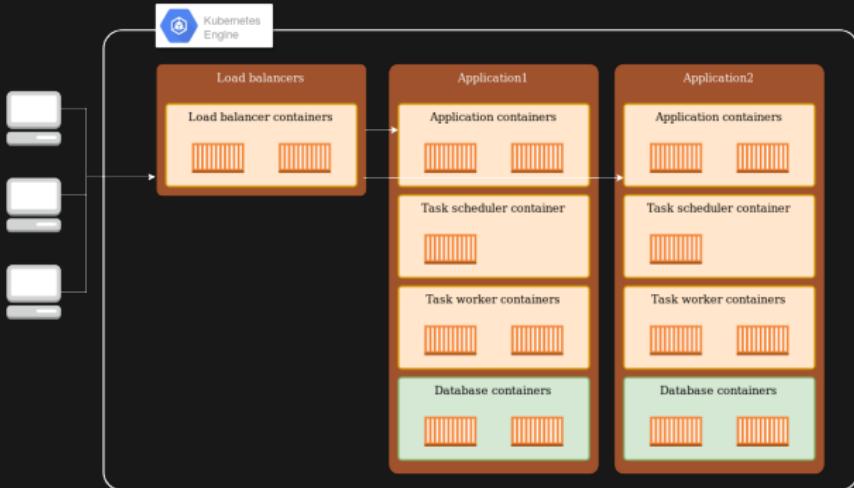
The actual move

- ▶ Moving apps one by one
- ▶ Only API communication
  - VPNs were helpful



# Moving to Kubernetes on GKE

The end result



# Moving to Kubernetes on GKE

Pain points revisited

- ▶ Long deployment times
  - Down from 15 minutes to 1-2 minutes



# Moving to Kubernetes on GKE

## Pain points revisited

- ▶ Long deployment times
  - Down from 15 minutes to 1-2 minutes
- ▶ Uncertainty of success
  - Using Docker as packaging worked



# Moving to Kubernetes on GKE

## Pain points revisited

- ▶ **Long deployment times**
  - Down from 15 minutes to 1-2 minutes
- ▶ **Uncertainty of success**
  - Using Docker as packaging worked
- ▶ **Deployments caused downtime**
  - No downtime deployments



# Moving to Kubernetes on GKE

## Pain points revisited

- ▶ **Long deployment times**
  - Down from 15 minutes to 1-2 minutes
- ▶ **Uncertainty of success**
  - Using Docker as packaging worked
- ▶ **Deployments caused downtime**
  - No downtime deployments
- ▶ **High cost**
  - Lowered



# Moving to Kubernetes on GKE

Pain points revisited

- ▶ **Long deployment times**
  - Down from 15 minutes to 1-2 minutes
- ▶ **Uncertainty of success**
  - Using Docker as packaging worked
- ▶ **Deployments caused downtime**
  - No downtime deployments
- ▶ **High cost**
  - Lowered
- ▶ **Not automated**
  - Automated (after some time)



# Moving to Kubernetes on GKE

No happy end

- ▶ **Bugs!**
  - Nodes crashing due to misconfigured journalctl
  - Frequent networking problems
- ▶ **Bad support**
- ▶ **Management by Google**
  - No way of accessing the API master machine
- ▶ **Inflexible configuration**
  - Not possible to turn on alpha features
  - Not possible to change node configuration
- ▶ **Waiting for Kubernetes security updates**



# Migrating back to AWS



# Moving to Kubernetes on AWS

Enter kops



- ▶ Cluster bootstrapping utility
- ▶ Lifecycle management
- ▶ Very flexible



# Moving to Kubernetes on AWS

New challenges

- ▶ Missing parts

- Authentication integrated with the rest of their cloud - **PKI**
- Centralized logging - **Graylog**
- Cluster monitoring - **Prometheus and Grafana**

- ▶ Moving stuff

- Container registry - **Amazon ECR**
- AWS and GKE load balancers behave differently
- Use EBS instead of Google disks



# Moving to Kubernetes on AWS

End result

- ▶ It's stable!
- ▶ Minor issues
  - EBS volumes get stuck on mount



# Questions?

