

# Infrastructure Automation at



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dozen

AWS Accounts

half-dozen

regions

dozen

services

~thousand

app servers



# Requirements

- Must work across accounts / regions
- Must be able to scale past a thousand nodes
- Must enforce security properties



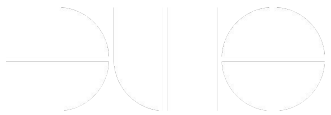


# kubernetes





ANSIBLE



2009



2010

2011

2012



2013



2014

2015



2016

2017



2018



# Ansible - in General

- Push, not pull
- Playbooks → roles → tasks
- Call AWS APIs (“infrastructure”), then SSH (“config”)
- “Idempotent”



# Ansible - at Duo

ansible/

library/                    - custom tasks

roles/                     - collections of tasks

<playbooks>              - collection of roles

group\_vars/               - config for a particular service

vars/                      - config for an AWS account





# Deploy Example

1. Pick one app server
  2. Remove from LB
  3. Download build
  4. Downgrade check
  5. Install build
  6. Validate config
  7. Apply DB schema updates
  8. Start service
  9. Health check passing
  10. Return to LB
- ... repeat for more app servers



# Meta: Enforcing Properties at Work

Person - “It’s \_\_\_\_\_’s job to answer the phone”

Place - “We go over PTO at our weekly meeting”

Process - “We don’t deploy until tests are green”



# Security Properties w/ Ansible

roles/

- |                    |                                      |
|--------------------|--------------------------------------|
| <service>-infra/   | - provision infra for service        |
| infra-redis/       | - firewall rules, password           |
| infra-rds/         | selection, encryption, ...           |
| infra-ec2-and-elb/ | - firewall rules, TLS, health checks |
| ec2-instance/      | - firewall rules, OS security, ...   |



# Non-Obvious Benefits

- Security compliance is much easier
- People w/o prod access can propose changes!
  - They can test them in dev!
- Changes across the fleet (usually) painless



A large crowd of people, mostly men, are gathered in a large hall, many with their arms raised in celebration. The scene is dimly lit with green stage lights. Three large screens in the background display the Duio logo. The word "Thanks!" is overlaid in large white text in the center of the image. In the bottom left corner, there is a small Duio logo.

# Thanks!