AWS CloudFormation

Introduction

- Productivity
  - Ability to destroy and re-create an infrastructure on the cloud on the fly
  - Automated generation of Diagram for your templates!
  - Declarative programming (no need to figure out ordering and orchestration)

- Separation of concern: create many stacks for many apps, and many layers. Ex:
  - VPC stacks
  - Network stacks
  - App stacks

- Don't re-invent the wheel
  - Leverage existing templates on the web!
  - Leverage the documentation

CloudFormation Vs. Ansible Vs. Terraform

- CloudFormation is AWS native, and will always contain the latest features and options for AWS Services
- CloudFormation is state based, and AWS figures out how to reach that state
- Ansible and Terraform are instruction based, and it can be difficult to fully orchestrate your stacks
- Ansible and Terraform have to be updated every time a new Services or API option comes from AWS, which can take a long time

- I have used Ansible and CloudFormation, and for AWS related work, I heavily recommend CloudFormation.

Just EC2

```
---
Resources:
  MyInstance:
    Type: AWS::EC2::Instance
    Properties:
      AvailabilityZone: us-east-1a
      ImageId: ami-0080e4c5bc078760e
      InstanceType: t2.micro
```

- Templates have to be uploaded in S3 and then referenced in CloudFormation
- To update a template, we can't edit previous ones. We have to re-upload a new version of the template to AWS
- Stacks are identified by a name
- Deleting a stack deletes every single artifact that was created by CloudFormation.

YAML

```yaml
invoice:        34843
date   :        2001-01-23
bill-to:
    given  :    Chris
    family :    Dumars
    address:
        lines: |
            458 Walkman Dr.
            Suite #292
        city     : Royal Oak
        state    : MI
        postal   : 48046
product:
    - sku          : BL394D
      quantity     : 4
      description  : Basketball
      price        : 450.00
    - sku          : BL4438H
      quantity     : 1
      description  : Super Hoop
      price        : 2392.00
```

- YAML and JSON are the languages you can use for CloudFormation.
- **JSON is horrible for CF**
- **YAML is great in so many ways**
- Let's learn a bit about it!

- Key value Pairs
- Nested objects
- Support Arrays
- Multi line strings
- Can include comments!

Creating S3 Bucket

- Creating a S3 bucket is free
- S3 is the AWS Service for storing static files in a replicated and globally available way
- It powers many websites, Single Page Apps, hosts all the Netflix video content, etc.

- We'll use CloudFormation to provision a S3 bucket!