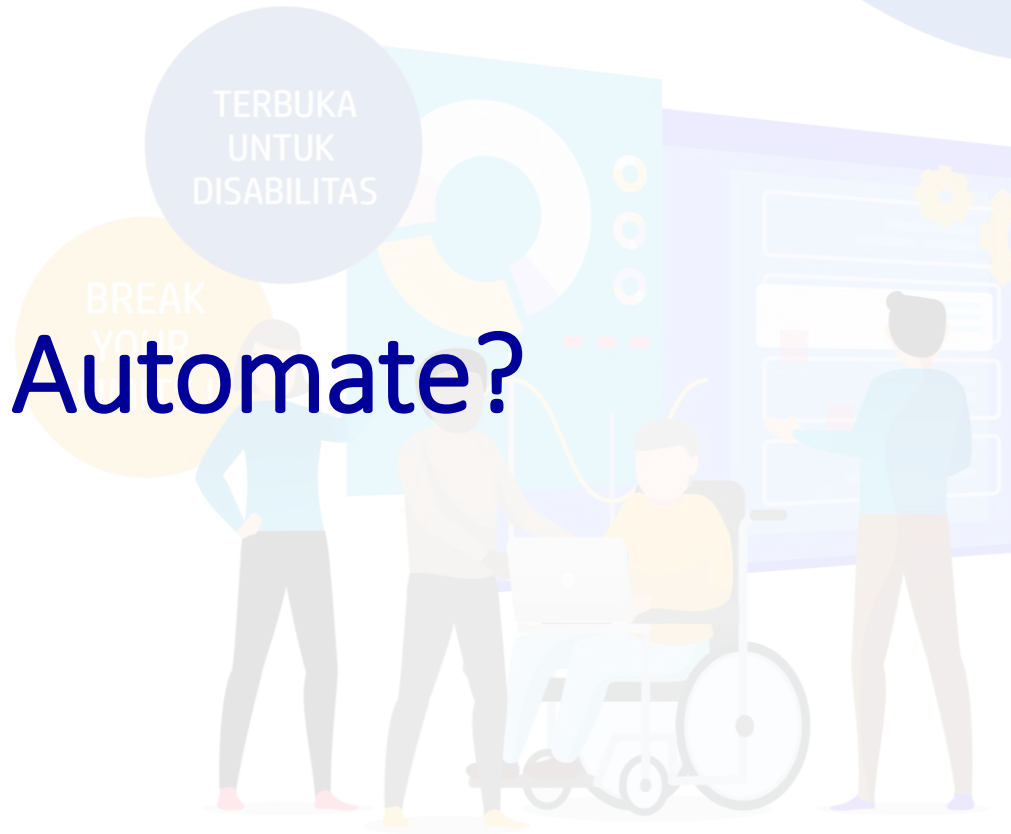# DIGITAL TALENT SCHOLARSHIP 2020

Automation

Agenda

- Why Automation

- Infrastructure as a Code
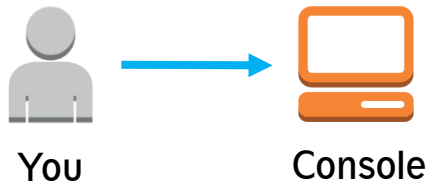
- Elastic Beanstalk

Why Should You Automate?

Without Automation

Long manual process to build an architecture

You → Console

Set up your storage

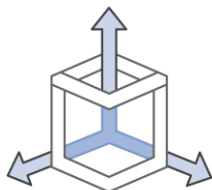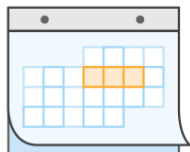Route your network

VPC

Create your instances

Build your databases

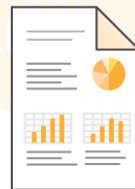# Risks From Manual Processes

Does not scale

No version control

Lack of audit trails

Inconsistent data management

In General

If you have to manually change something in your production environment,
you are putting yourself at risk.

Manual processes are risks without reward.

Infrastructure as Code

- By now, you have experienced how to create instances of AWS services such as virtual machines (EC2), containers (ECS), storage (S3)

- Provisioning a stack of 1 – 10 instances of AWS services are still manageable by hand

- But how about:
  - Managing hundreds or, even, thousands of them?
  - Replicating existing stack to a different region?

- Do you want to manually navigating through the AWS Management Console to provision each instance?

Infrastructure as Code

- Lets you model and declare how to provision the required resources in your infrastructure as a text file
  - Consequently, you can check in the infrastructure model along with your application in a version control system (e.g. Git)

- The cloud service provider (i.e. AWS) provides a service that parses the infrastructure configuration file and provisions them automatically

- Cloud provider-agnostic tools also exist, such as Ansible, Salt, and Puppet

AWS CloudFormation

- *"Gives developers and sysadmins an easy way to create and manage a collection of related AWS resources, provisioning and updating them in an orderly and predictable fashion."* – Amazon

- AWS's offering on managing infrastructure via code

- Also provides a graphical designer tool to lets the users to model their infrastructure as a diagram and generates the text representation
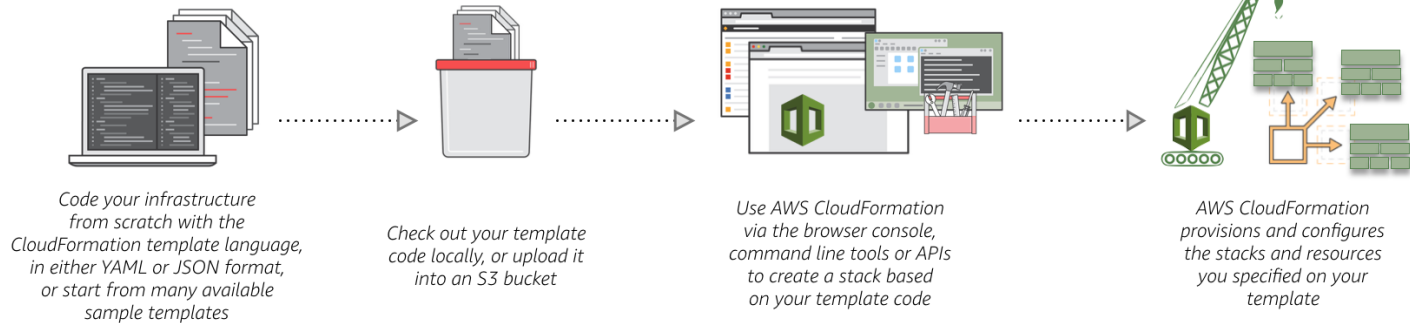
Terms in AWS CloudFormation

- Template
    - *"A simple text file that describes a stack"* – Amazon
    - Written in JSON or YAML format
    - Template anatomy: https://docs.aws.amazon.com/AWSCloudFormation/latest/UserGuide/template-anatomy.html
    - Samples: https://docs.aws.amazon.com/AWSCloudFormation/latest/UserGuide/cfn-sample-templates.html
- Stack
    - *"A collection of AWS resources you want to deploy together as a group"* – Amazon

How it Works?

Code your infrastructure
from scratch with the
CloudFormation template language,
in either YAML or JSON format,
or start from many available
sample templates

Check out your template
code locally, or upload it
into an S3 bucket

Use AWS CloudFormation
via the browser console,
command line tools or APIs
to create a stack based
on your template code

AWS CloudFormation
provisions and configures
the stacks and resources
you specified on your
template

https://aws.amazon.com/cloudformation/

Sample Cloud Formation Code

```yaml
Resources:
 Ec2Instance:
   Type: AWS::EC2::Instance
   Properties:
     InstanceType: t3.small
     ImageId: ami-035b3c7efe6d061d5
Tags:
     - Key: Name
       Value: CFServer0819
```

By using this yaml file, we can create AWS resource in North Virginia. An EC2 Instance, t3 Small, named CFServer0819

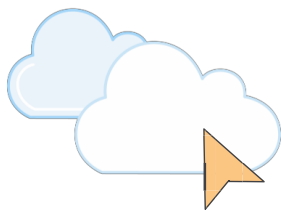If we have some update, we can change the yaml.

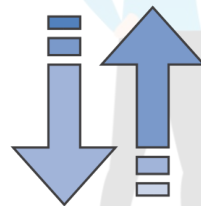We can have consistency in what we going to create

AWS Elastic Beanstalk

If we don't want to start our implementation by using EC2, VPC, ELB etc. We can easily deploy our code such as PHP, Java, Python, Ruby, Node.js, .NET, Go or Docker application using Elastic Beanstalk
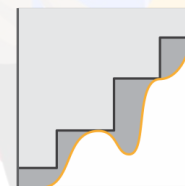
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Developer productivity

Impossible to outgrow

Complete resource control

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