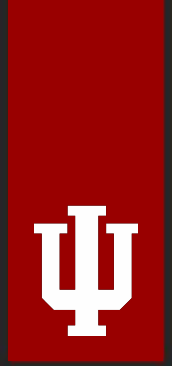
1:30–3:30pm

Build your home on the cloud with Terraform & AWS

Phuong Dinh



LIBRARIES

Build your home on the cloud with

Terraform & AWS

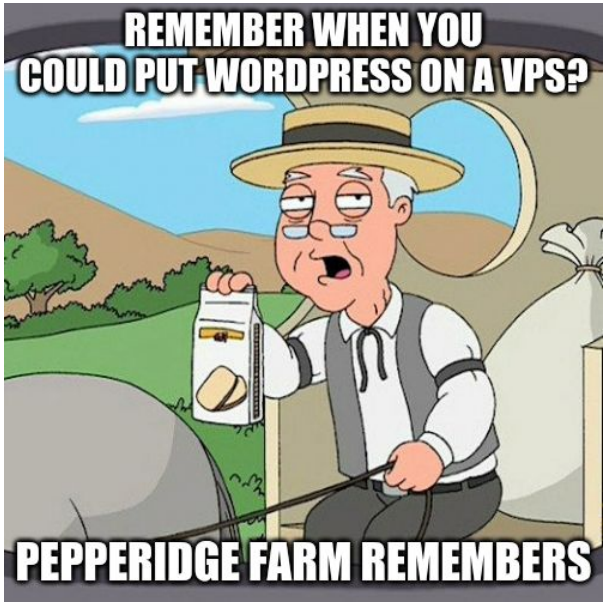
Phuong Dinh
Library Technologies

SECTION 1

Infrastructure-as-Code

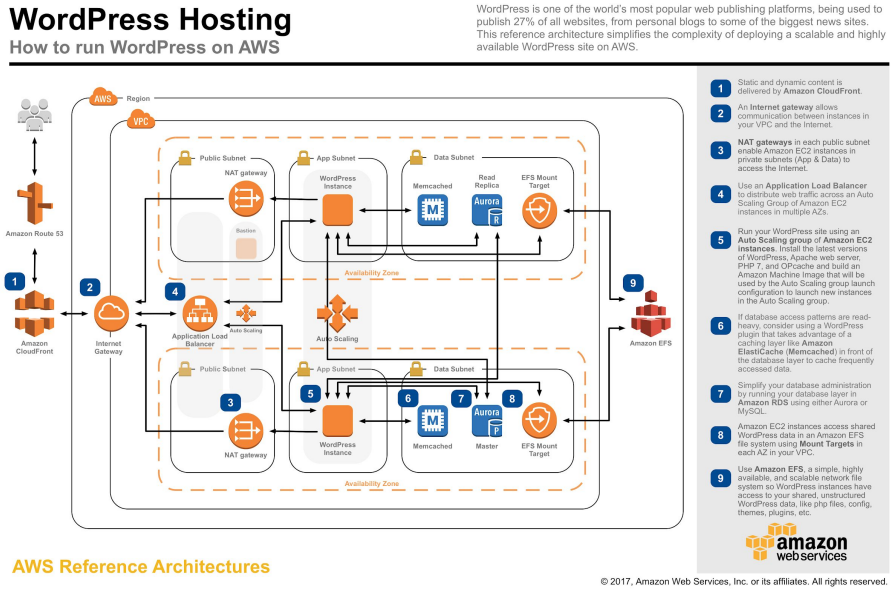
The problem

- Modern infrastructure is complex



The problem

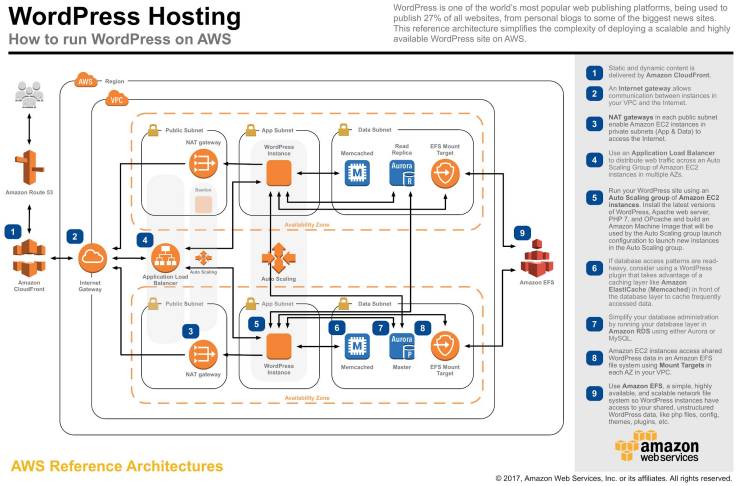
- Modern infrastructure is complex



LIBRARIES

The problem

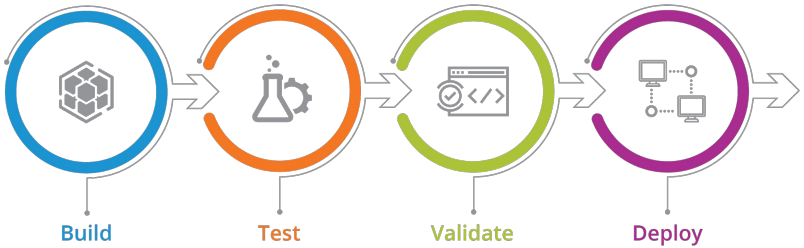
- Modern infrastructure is complex
- Keeping track of all the pieces is hard



LIBRARIES

The problem

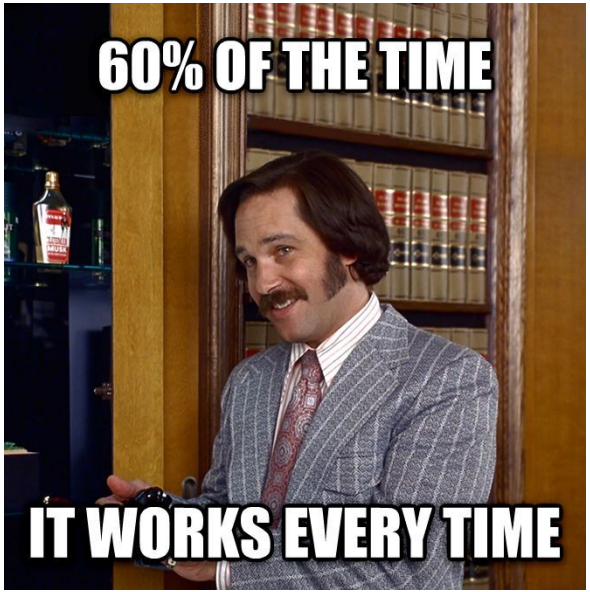
- Modern infrastructure is complex
- Keeping track of all the pieces is hard
- With flexibility comes rapid prototyping/evolving



LIBRARIES

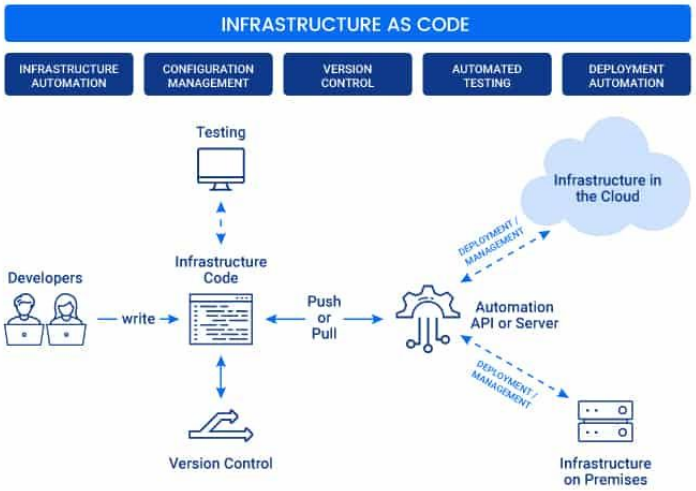
The problem

- Modern infrastructure is complex
- Keeping track of all the pieces is hard
- With flexibility comes rapid prototyping/evolving
- Dev/stage/prod parity



The solution: Infrastructure as Code

- Config files as single source of truth



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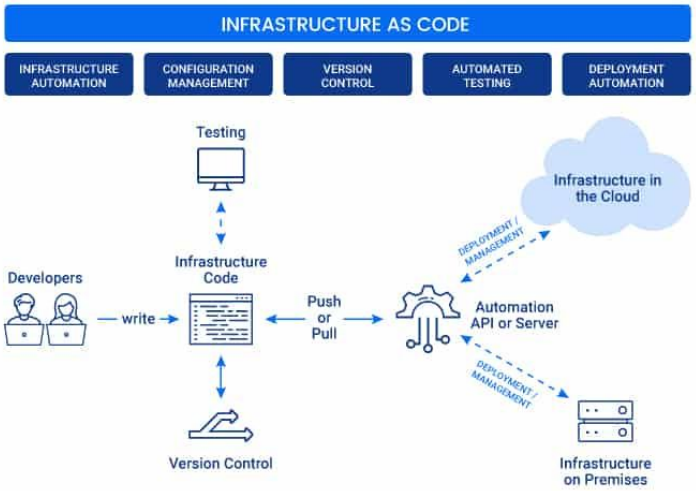
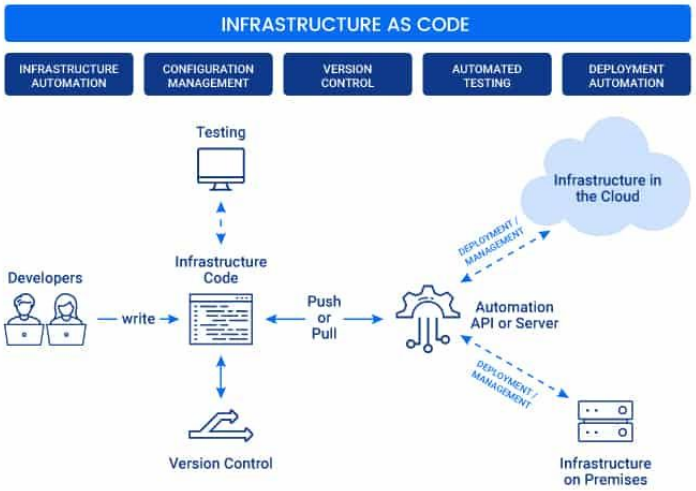
The solution: Infrastructure as Code

- Config files as single source of truth
- Version control



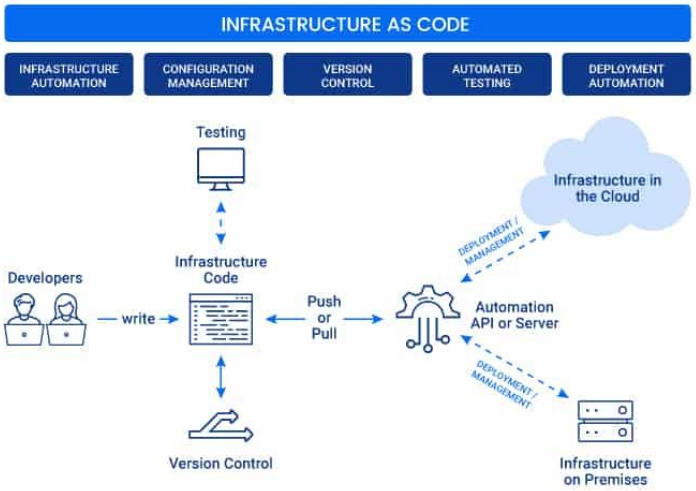
The solution: Infrastructure as Code

- Config files as single source of truth
- Version control
- State management



The solution: Infrastructure as Code

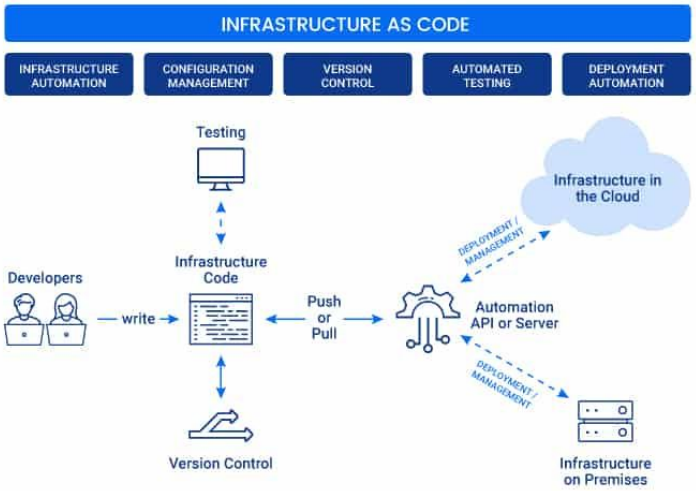
- Config files as single source of truth
- Version control
- State management
- Consistent



LIBRARIES

The solution: Infrastructure as Code

- Config files as single source of truth
- Version control
- State management
- Consistent
- Reusable. Testable



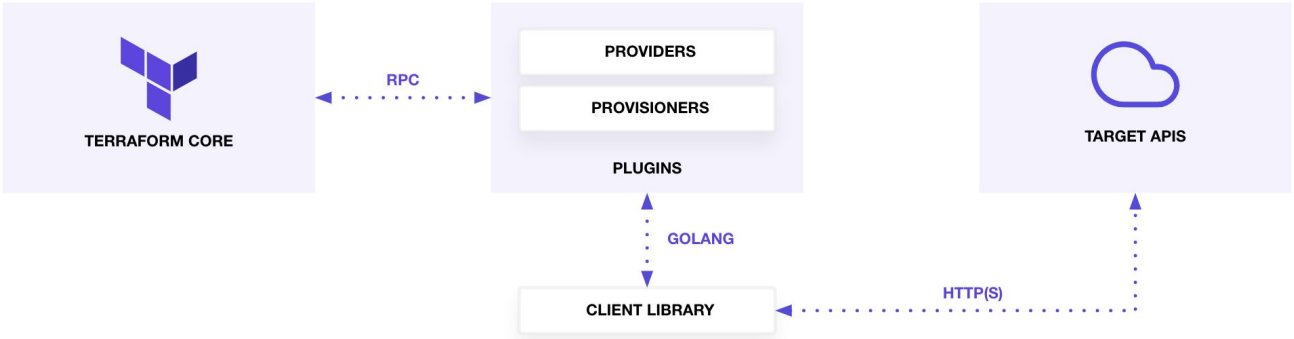
LIBRARIES

SECTION 2

Terraform

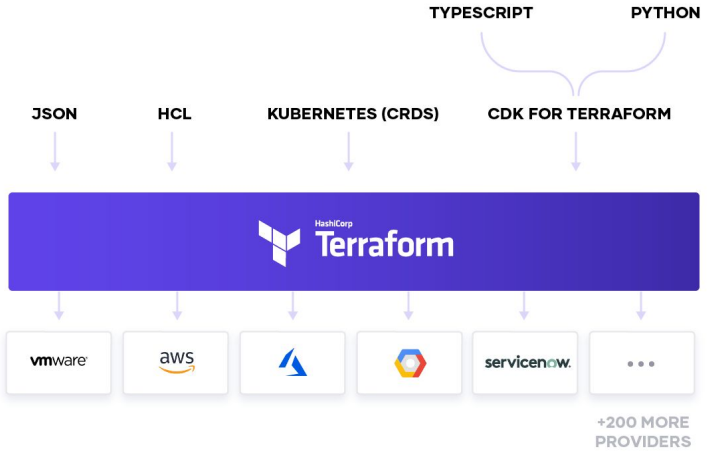
Terraform

- Infrastructure as Code tool



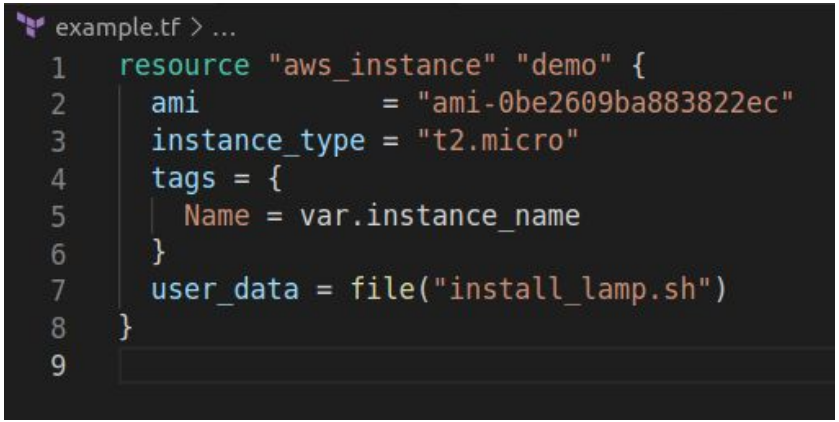
Terraform

- Infrastructure as Code tool
- Hundreds of providers: AWS, GCP, Azure, VMware..



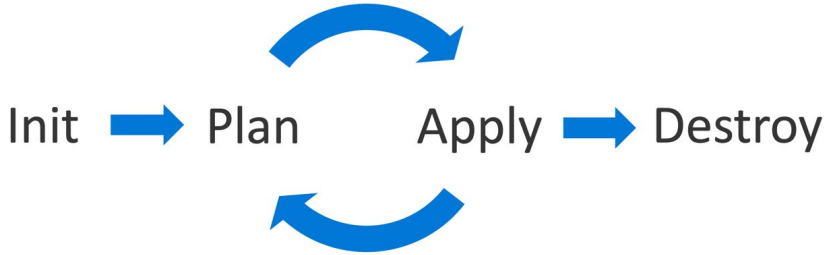
Terraform

- Infrastructure as Code tool
- Hundreds of providers: AWS, GCP, Azure, VMware..
- HCL or JSON



Terraform

- Infrastructure as Code tool
- Hundreds of providers: AWS, GCP, Azure, VMware..
- HCL or JSON
- Simple CLI interface

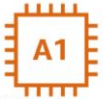
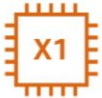


SECTION 3

AWS

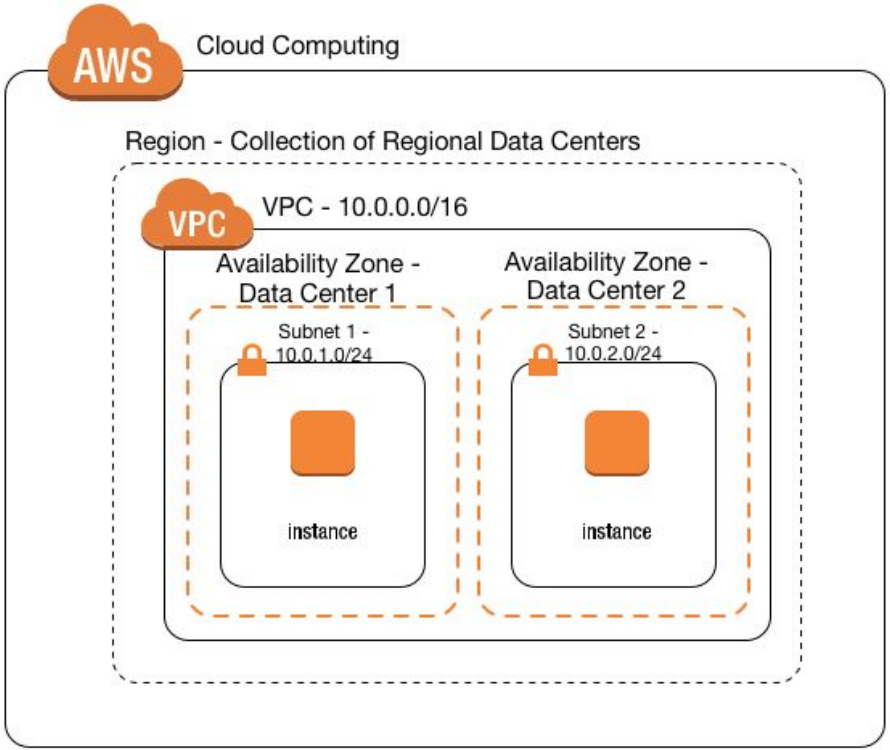
Core concepts

- EC2: virtual machine

General Purpose	Compute Optimised	Memory Optimised	Accelerated Computing	Storage Optimised
 ARM based core and custom silicon	 Compute - CPU intensive apps and DBs	 RAM - Memory intensive apps and DB's	 Processing optimised- Machine Learning	 High Disk Throughput - Big data clusters
 Tiny - Web servers and small DBs		 Xtreme RAM - For SAP/Spark	 Graphics Intensive - Video and streaming	 IOPS - NoSQL DBs
 Main - App servers and general purpose		 High Compute and High Memory - Gaming	 Field Programmable - Hardware acceleration	 Dense Storage - Data Warehousing

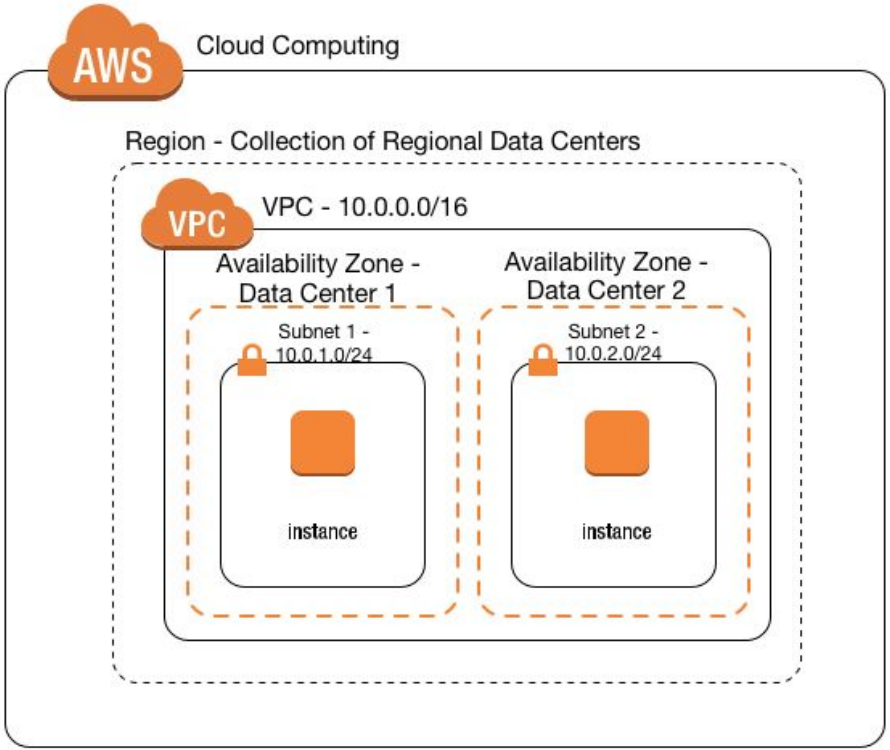
Core concepts

- EC2: virtual machine
- VPC: virtual network



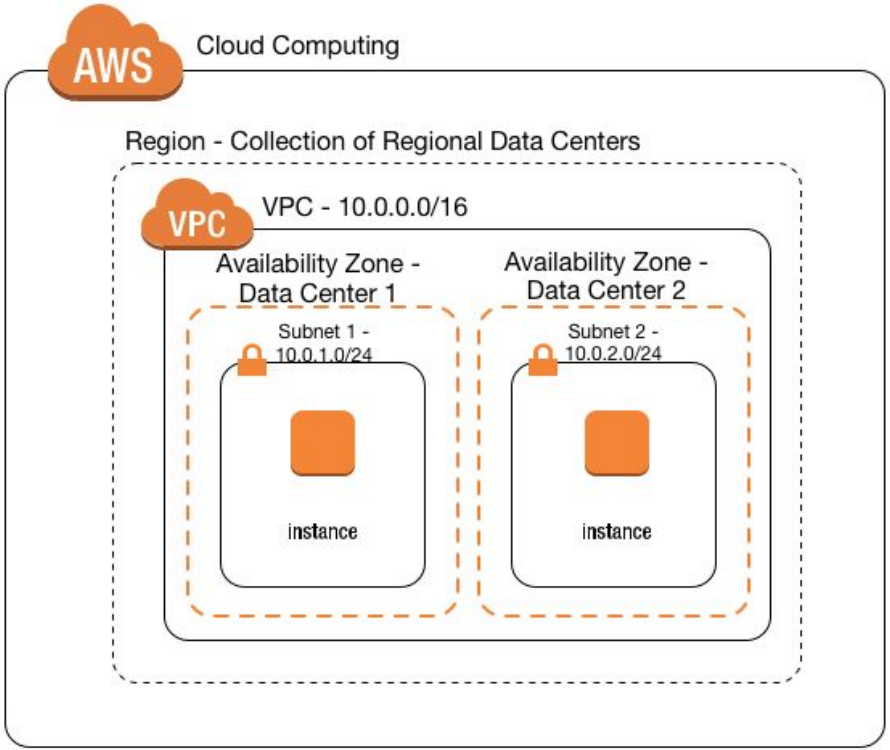
Core concepts

- EC2: virtual machine
- VPC: virtual network
- Availability Zone: data centers



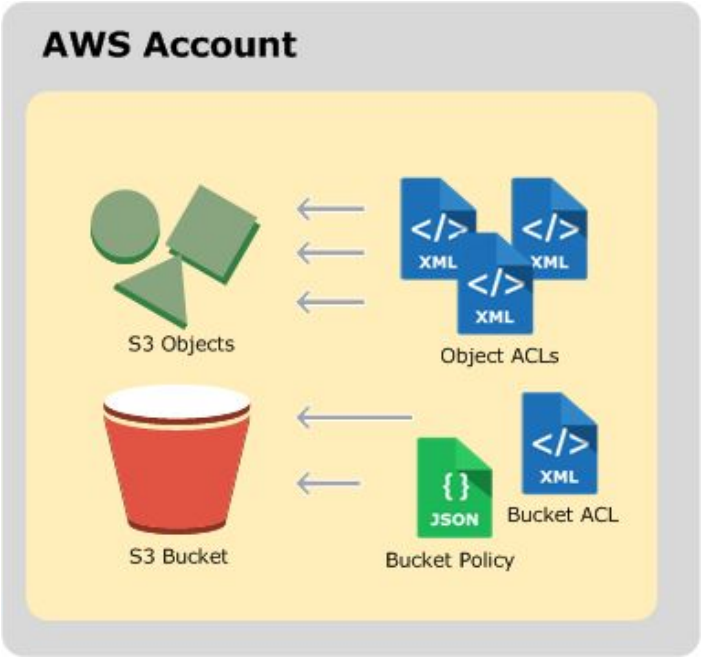
Core concepts

- EC2: virtual machine
- VPC: virtual network
- Availability Zone: data centers
- Subnet: public, private



Core concepts

- EC2: virtual machine
- VPC: virtual network
- Availability Zone: data centers
- Subnet: public, private
- S3: object store



LIBRARIES

SECTION 4

Hands-on exercises

Getting started

- https://github.com/phuongdh/terraform-workshop

SECTION 5

Is there more?

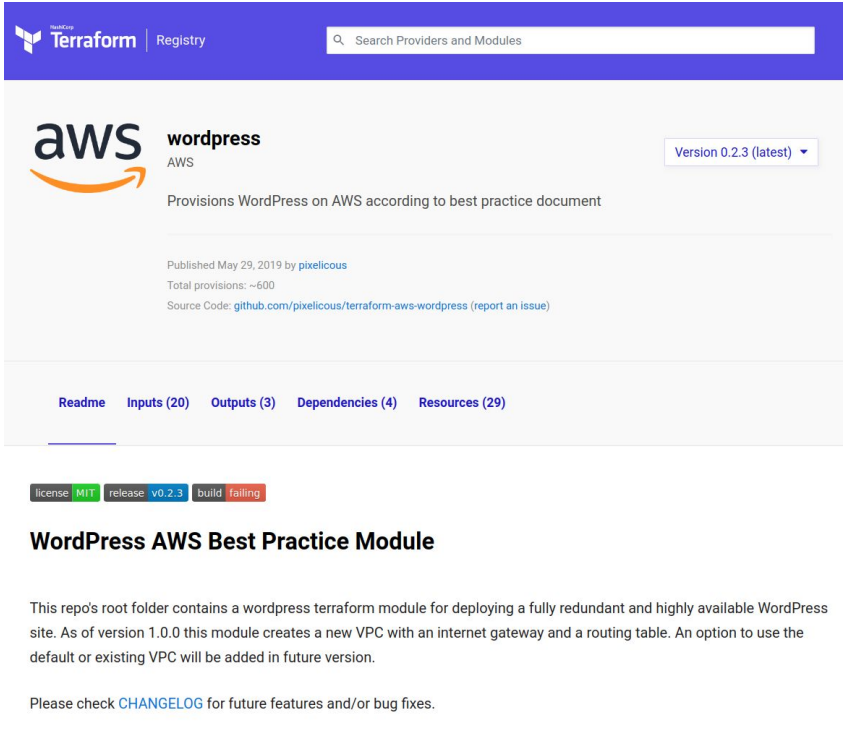
Other Terraform features

- Data Sources

```
data "local_file" "install_script" {
  filename = "${path.module}/install.sh"
}
```

Other Terraform features

- Data Sources
- Modules (example)



Other Terraform features

- Data Sources
- Modules (example)
- Functions, Expressions, etc.
- Import existing infrastructure

Alternative Tools

CloudFormation	CDK	Pulumi
• transactional • extremely verbose • doesn't support some AWS services • struggle with drifts	• use "normal" languages • translates to CloudFormation templates • CDK for Terraform	• use "normal" languages • can use Terraform providers • import HCL code • multi-cloud

Questions: pdinh@indiana.edu

Thank you!

INDIANA UNIVERSITY BLOOMINGTON