

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

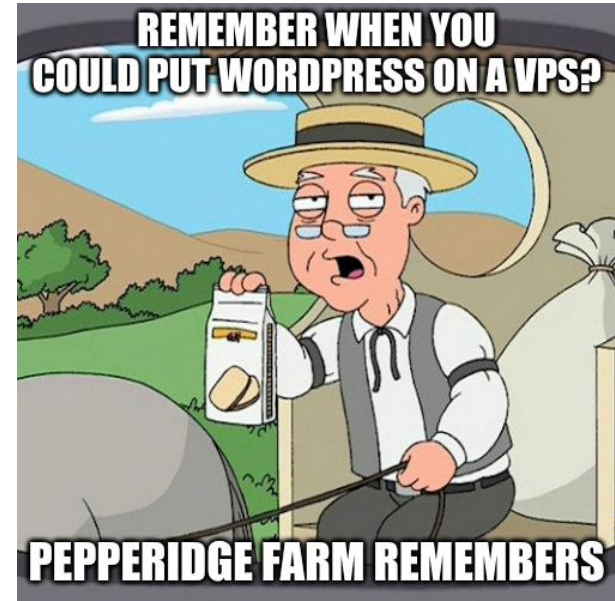
Phuong Dinh
Library Technologies

SECTION 1

Infrastructure-as-Code

The problem

- Modern infrastructure is complex



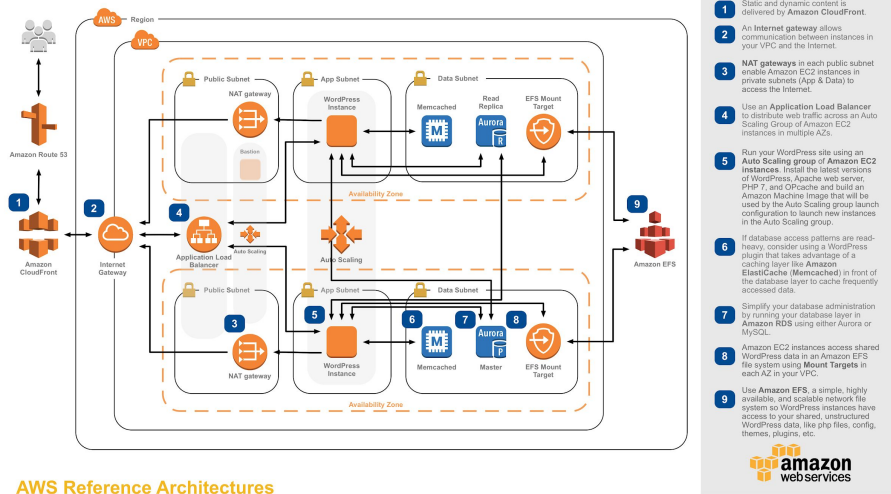
The problem

- Modern infrastructure is complex

WordPress Hosting

How to run WordPress on AWS

WordPress is one of the world's most popular web publishing platforms, being used to publish 27% of all websites, from personal blogs to some of the biggest news sites. This reference architecture simplifies the complexity of deploying a scalable and highly available WordPress site on AWS.



AWS Reference Architectures

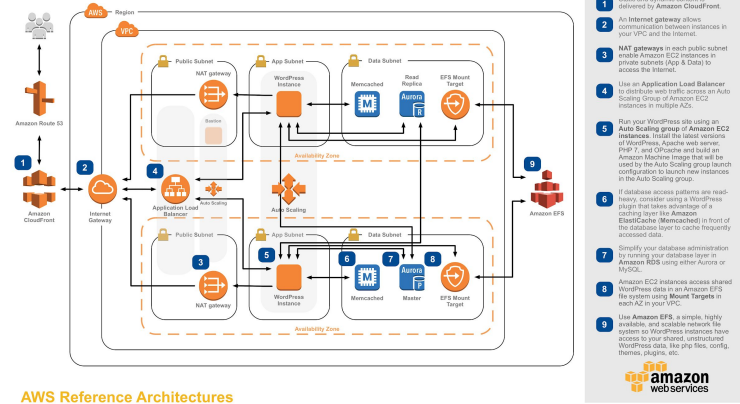
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The problem

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

WordPress Hosting How to run WordPress on AWS

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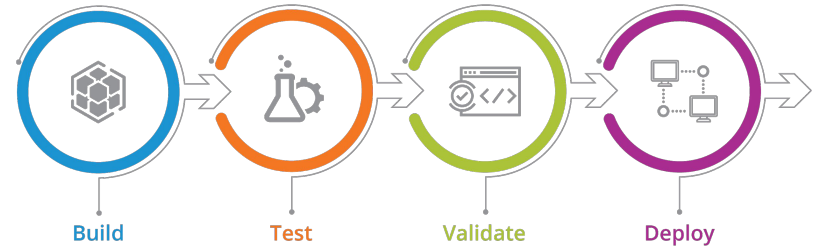


AWS Reference Architectures

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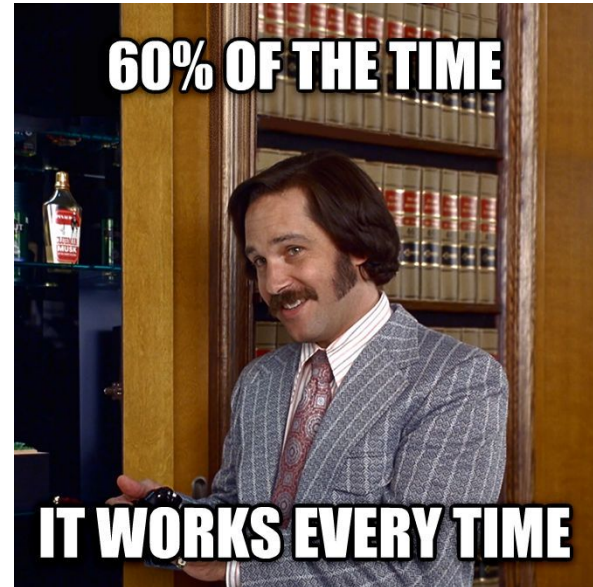
The problem

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



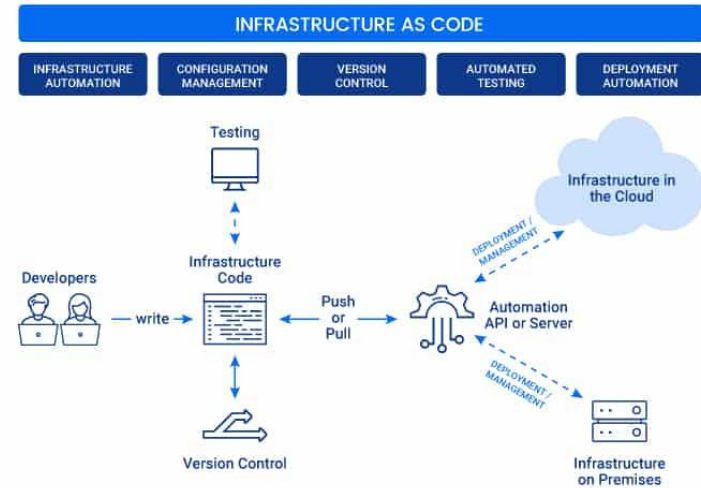
The problem

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



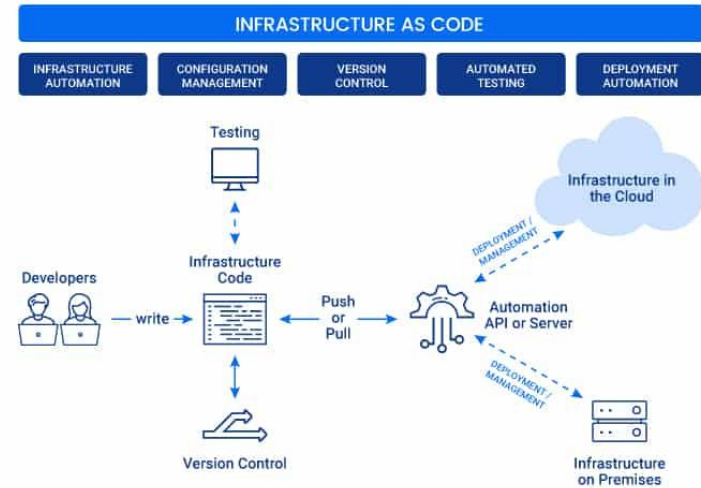
The solution: Infrastructure as Code

- Config files as single source of truth



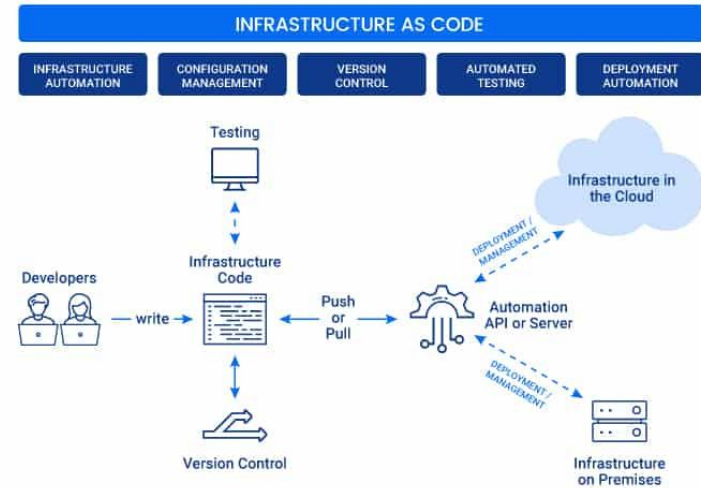
The solution: Infrastructure as Code

- Config files as single source of truth
- Version control



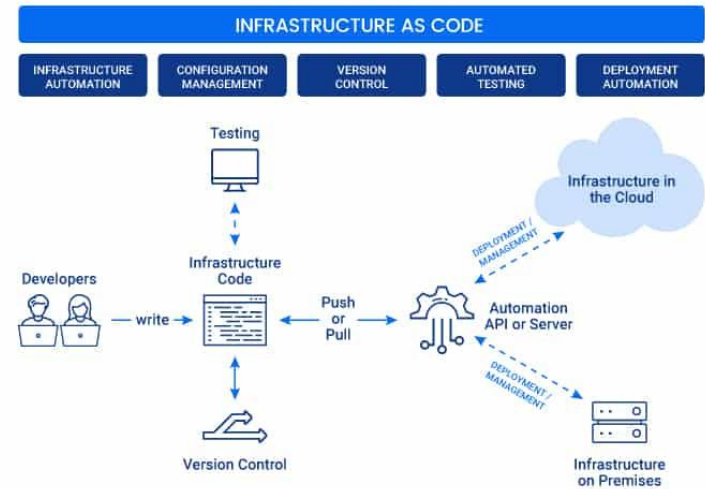
The solution: Infrastructure as Code

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



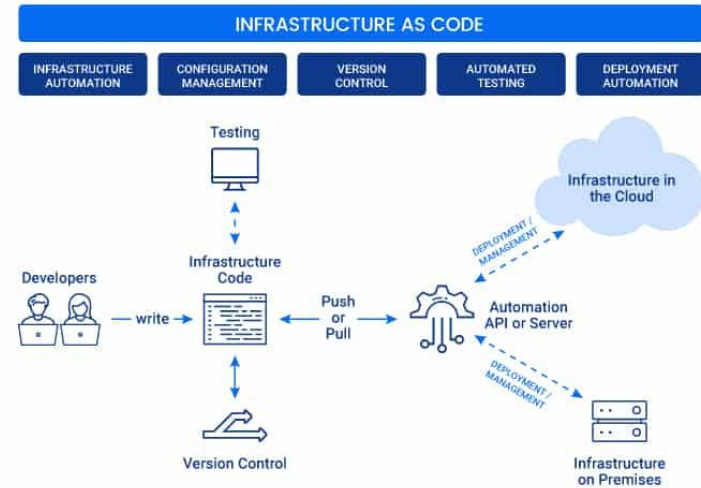
The solution: Infrastructure as Code

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



The solution: Infrastructure as Code

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

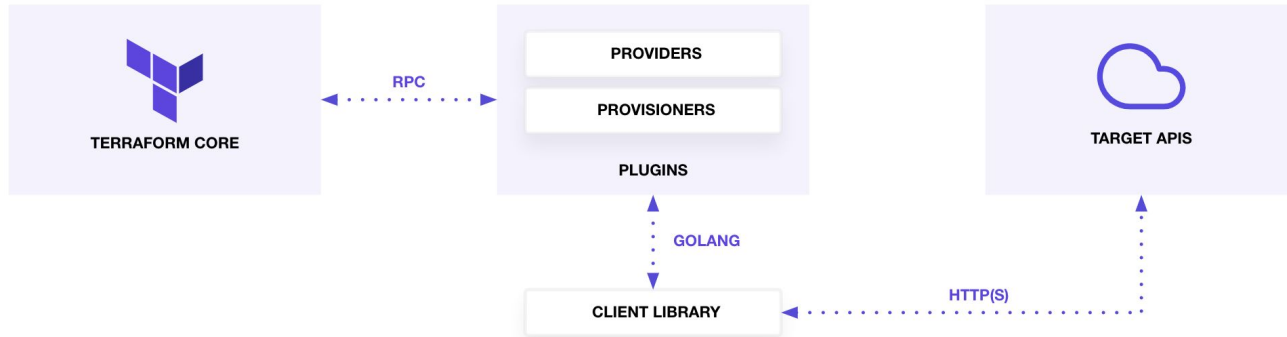


SECTION 2

Terraform

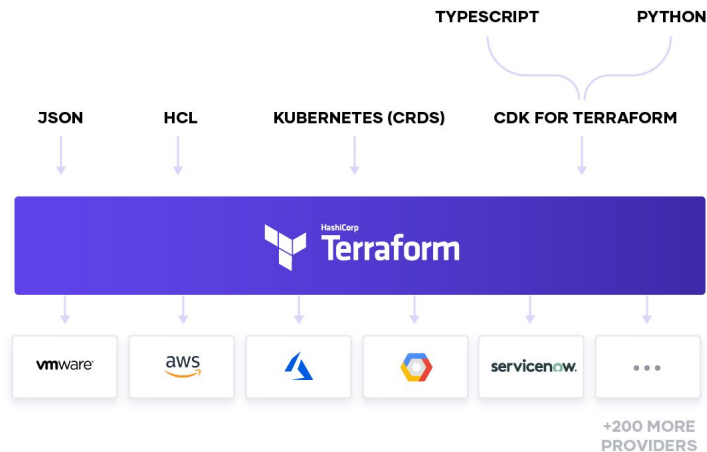
Terraform

- Infrastructure as Code tool



Terraform

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



Terraform

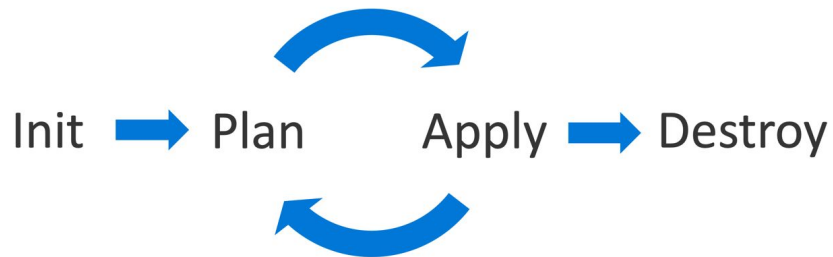
- Infrastructure as Code tool
- Hundreds of providers: AWS, GCP, Azure, VMware..
- HCL or JSON

```
example.tf > ...  
1  resource "aws_instance" "demo" {  
2      ami           = "ami-0be2609ba883822ec"  
3      instance_type = "t2.micro"  
4      tags = {  
5          Name = var.instance_name  
6      }  
7      user_data = file("install_lamp.sh")  
8  }  
9
```



Terraform

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
















SECTION 3

AWS

Core concepts

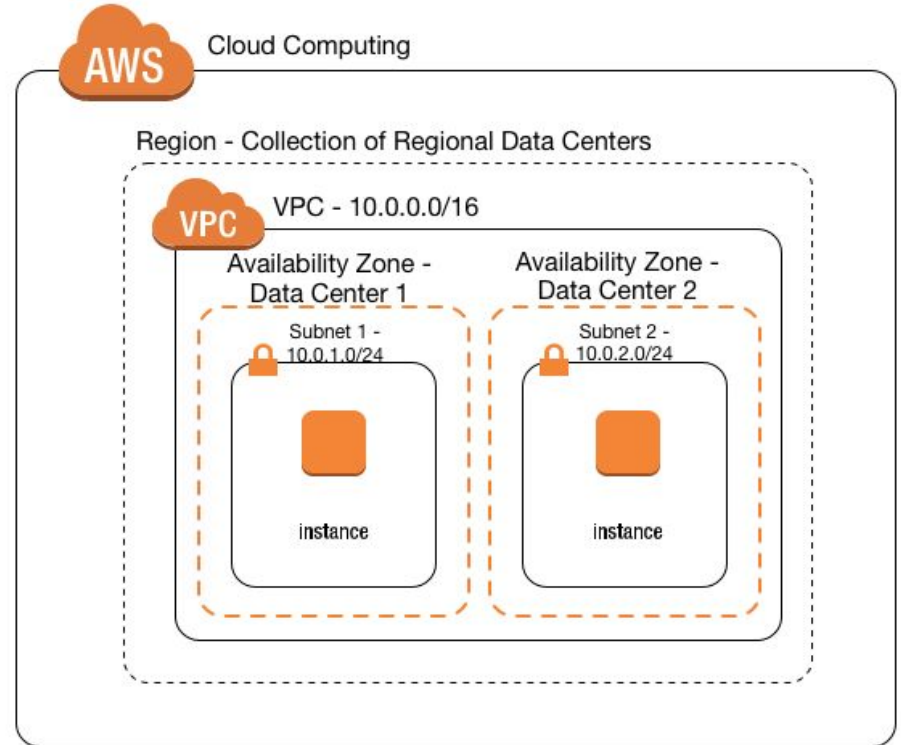
- EC2: virtual machine

General Purpose	Compute Optimised	Memory Optimised	Accelerated Computing	Storage Optimised
 A1 ARM based core and custom silicon	 C4 Compute - CPU intensive apps and DBs	 R4 RAM - Memory intensive apps and DB's	 P2 Processing optimised - Machine Learning	 H1 High Disk Throughput - Big data clusters
 T2 Tiny - Web servers and small DBs		 X1 Xtreme RAM - For SAP/Spark	 G3 Graphics Intensive - Video and streaming	 I3 IOPS - NoSQL DBs
 M4 Main - App servers and general purpose		 z1d High Compute and High Memory - Gaming	 F1 Field Programmable - Hardware acceleration	 D2 Dense Storage - Data Warehousing



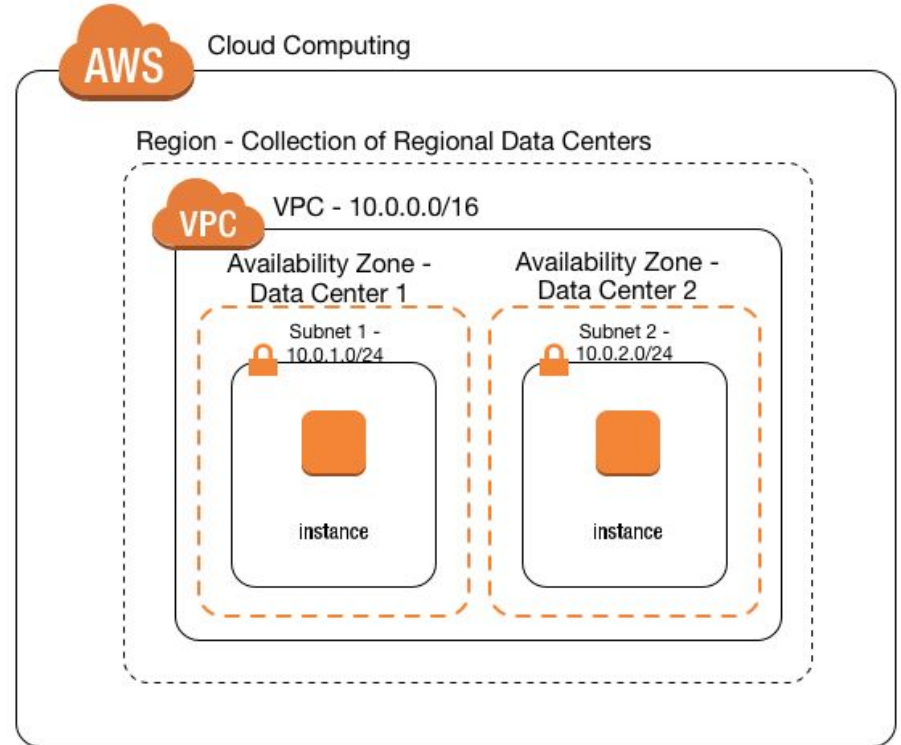
Core concepts

- EC2: virtual machine
- VPC: virtual network



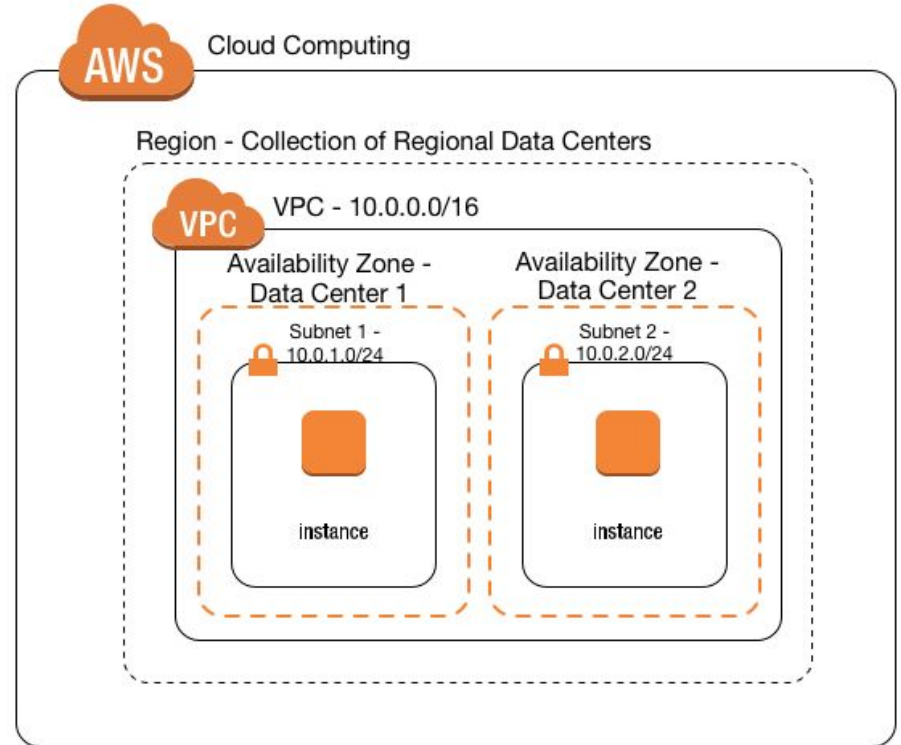
Core concepts

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



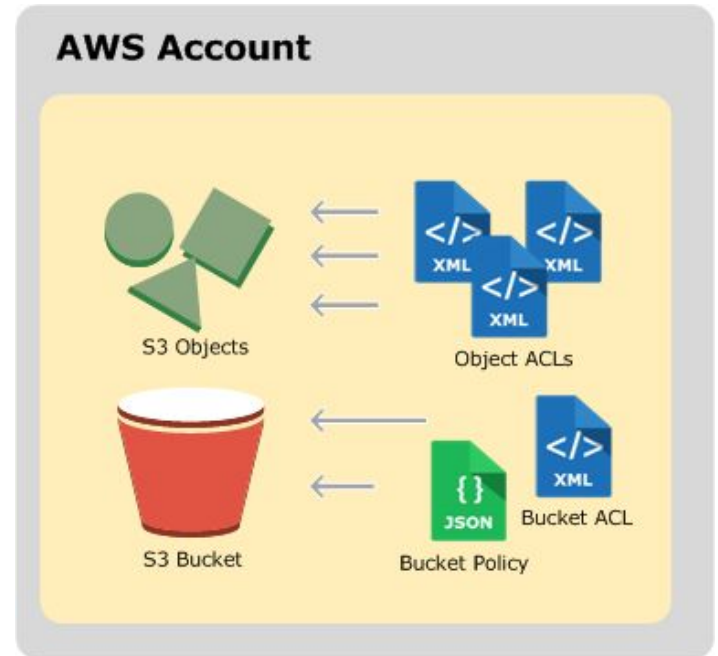
Core concepts

- 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



SECTION 4

Hands-on exercises

Getting started

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



SECTION 5

Is there more?

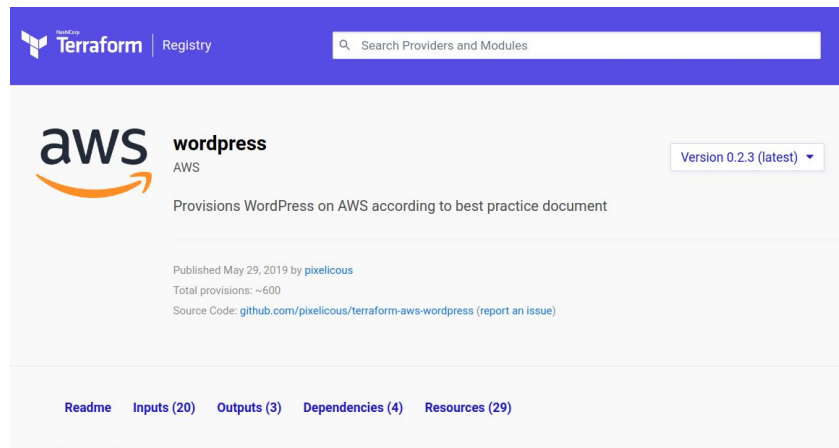
Other Terraform features

- Data Sources

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

Other Terraform features

- Data Sources
- Modules ([example](#))



The screenshot shows the Terraform Registry interface. At the top is a blue header with the Terraform logo, the word 'Registry', and a search bar labeled 'Search Providers and Modules'. Below the header, the 'aws-wordpress' module is displayed. It features the AWS logo, the module name 'wordpress', and the provider 'AWS'. A dropdown menu shows 'Version 0.2.3 (latest)'. The description reads: 'Provisions WordPress on AWS according to best practice document'. Below this, it states 'Published May 29, 2019 by pixelicous', 'Total provisions: ~600', and 'Source Code: github.com/pixelicous/terraform-aws-wordpress (report an issue)'. At the bottom of the module card are links for 'Readme', 'Inputs (20)', 'Outputs (3)', 'Dependencies (4)', and 'Resources (29)'.

license MIT release v0.2.3 build failing

WordPress AWS Best Practice Module

This repo's root folder contains a wordpress terraform module for deploying a fully redundant and highly available WordPress site. As of version 1.0.0 this module creates a new VPC with an internet gateway and a routing table. An option to use the default or existing VPC will be added in future version.

Please check [CHANGELOG](#) for future features and/or bug fixes.



LIBRARIES

Other Terraform features

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

Alternative Tools

CloudFormation	CDK	Pulumi
<ul style="list-style-type: none">• transactional• extremely verbose• doesn't support some AWS services• struggle with drifts	<ul style="list-style-type: none">• use “normal” languages• translates to CloudFormation templates• CDK for Terraform	<ul style="list-style-type: none">• use “normal” languages• can use Terraform providers• import HCL code• multi-cloud

Questions: pdinh@indiana.edu

Thank you!



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