Infrastructure as code with Terraform

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Agenda

What is Infrastructure as Code (IaC)?

What is Terraform?

What's HCL?

Demo

What's Infrastructure as Code (IaC)?

- Definition: IaC is the process of managing and provisioning your IT infrastructure thru declarative definition files, rather than physical hardware configuration or interactive configuration tools.

- Benefits:

Speed	Consistency	Traceability	Lower cost
• Enabling you quickly set up your complete infrastructure by running a script per each environment. It make SDLC more efficient.	• Avoid manually configuration per environment. All infrastructure settings come from the same set of configuration files.	• Since you can version IaC configuration files like any source code file, you have full traceability of their changes.	• Infrastructure deployments are repeatable, scalable and can be fully automated.

What is Terraform?

- An open-source tool created by HashiCorp and released in 2014. Using a *declarative* configuration language aka *HashiCorp Configuration Language* (HCL) to manage infrastructure as code.

- It supports an extensive list of cloud infrastructure *providers* such as AWS, Azure, GCP, etc.

- Workflow:

Terraform Config Files (.tf) → Init → Plan → Apply → (Destroy) → Cloud Infrastructure

Terraform CLI

HashiCorp Configuration Language (HCL)

```
resource "aws_vpc" "main" {
  cidr_block = var.base_cidr_block
}


<BLOCK TYPE> "<BLOCK LABEL>" "<BLOCK LABEL>" {
  # Block body
  <IDENTIFIER> = <EXPRESSION> # Argument
}
```
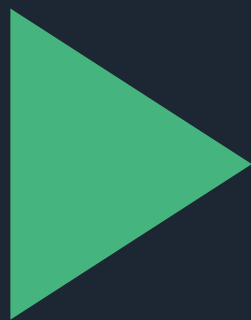
- *Blocks* are containers for other content and usually represent the configuration of some kind of object, like a resource. Blocks have a block type, can have zero or more labels, and have a body that contains any number of arguments and nested blocks. Most of Terraform's features are controlled by top-level blocks in a configuration file. Here is the list of block types: resource, data, provider, variable, output and module

- *Arguments* assign a value to a name. They appear within blocks.

- *Expressions* represent a value, either literally or by referencing and combining other values. They appear as values for arguments, or within other expressions.

Prerequisites

- Installation Instructions:

    - Terraform CLI: https://learn.hashicorp.com/tutorials/terraform/install-cli?in=terraform/aws-get-started

    - AWS CLI: https://docs.aws.amazon.com/cli/latest/userguide/cli-chap-install.html

    - Docker: https://docs.docker.com/get-docker/

Terraform Demos

References

- Learning Terraform: https://learn.hashicorp.com/terraform

- Demo Codes: https://github.com/wingchanatibsa/LearningSessions/tree/master/Terraform/demo