HashiCorp

Terraform

Extending CDK for Terraform constructs

Making our lives easier with L2 constructs

About

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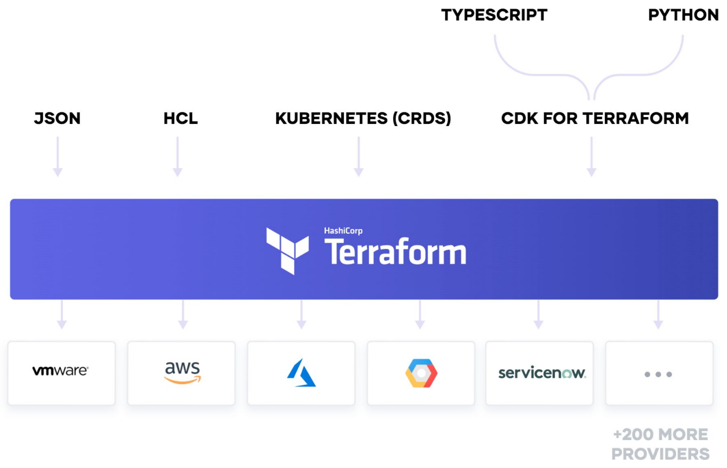
CDK for Terraform

Use Terraform with programming constructs in high-level languages

Supported Languages

- TypeScript / JavaScript
- Java
- Python
- C#

Soon: Golang



Example

HCL

```
resource "aws_instance" "web" {
  ami           = "ami-0848da720bb07de35"
  instance_type = "t3.micro"

  tags = {
    Name = "HelloWorld"
  }
}
```

TypeScript

```
new Instance(this, 'web', {
    ami: 'ami-0848da720bb07de35',
    instanceType: 't3.micro',
    tags: {
        Name: 'HelloWorld'
    }
});
```

Goals

Why should we extend constructs?

- Show intent instead of implementation details
- Move verbosity to a separate file
- Build reusable building blocks
- Keep things DRY

AWS CDK

Layer 2 constructs

```
const lambda = new lambda.Function(this, 'Lambda', { /* ... */ });
const bucket = new Bucket(this, 'MyBucket');

bucket.grantReadWrite(lambda);
```

Example from AWS CDK docs

Granting Access

Combining arbitrary Terraform resources of different providers

- Providers used in demo
  - AWS
  - DigitalOcean

Implementation

Extending a CDK for Terraform construct

```
import { Grantor } from "./lib/grants";
import { DatabaseCluster as BaseDatabaseCluster, Droplet } from "./.gen/providers/digitalocean";

const DatabaseCluster = Grantor(BaseDatabaseCluster);

const db = new DatabaseCluster(this, 'db', {...});
const droplet = new Droplet(this, 'droplet', {...});

db.grantAccess(droplet);
```

Show us the real code!

Recap

Extending a CDK for Terraform construct

```
import { Grantor } from "./lib/grants";
import { Droplet } from "./.gen/providers/digitalocean";
import { TerraformAwsModulesRdsAws as BaseTerraformAwsModulesRdsAws } from
'./.gen/modules/terraform-aws-modules/rds/aws'
import { DropletToRdsViaSecurityGroupGrantStrategy } from 'somewhere'

const TerraformAwsModulesRdsAws = Grantor(BaseTerraformAwsModulesRdsAws);

const securityGroup = new SecurityGroup(this, 'sg-rds-cdkday-test', {...});
const db = new TerraformAwsModulesRdsAws(this, 'db', {...});
const droplet = new Droplet(this, 'droplet', {...});

db.grantAccess(droplet, new DropletToRdsViaSecurityGroupGrantStrategy(securityGroup));
```

What can we do now?

Endless possibilities await

- Build abstractions for combinations of resources
- Use generics in TypeScript to catch invalid configuration very early on
- Use all the existing Terraform modules and providers

– 982 providers, 5681 modules & counting (registry.terraform.io)

  – Modules implementing lots of best practices already

- Use our own modules

What’s next?

From prototype to usable experiments

- Make this available in more languages via JSII
  - JSII currently does not support generics
- A lot more experimentation needed
  - Across many different resource types
  - What syntax is idiomatic in other languages

Links

Get started with the CDK for Terraform

https://cdk.tf

https://github.com/ansgarm/talk-cdkday-2021

https://learn.hashicorp.com/tutorials/terraform/cdktf

https://discuss.hashicorp.com/c/terraform-core/cdk-for-terraform/47

Thank You

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