



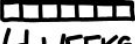

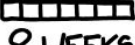


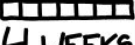

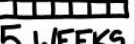




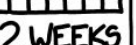




Use Terraform to scale your team

Edward Wilde - @openfaas core contributor - @ewilde
Platform Architect, Form3

What is the problem?

HOW LONG CAN YOU WORK ON MAKING A ROUTINE TASK MORE EFFICIENT BEFORE YOU'RE SPENDING MORE TIME THAN YOU SAVE? (ACROSS FIVE YEARS)

<https://xkcd.com/1205/>

		HOW OFTEN YOU DO THE TASK					
		50/DAY	5/DAY	DAILY	WEEKLY	MONTHLY	YEARLY
HOW MUCH TIME YOU SHAVE OFF	1 SECOND	 DAY	2 HOURS	30 MINUTES	4 MINUTES	1 MINUTE	5 SECONDS
	5 SECONDS	 DAYS	12 HOURS	2 HOURS	21 MINUTES	5 MINUTES	25 SECONDS
	30 SECONDS	 4 WEEKS	 3 DAYS	12 HOURS	2 HOURS	30 MINUTES	2 MINUTES
	1 MINUTE	 8 WEEKS	 6 DAYS	 1 DAY	4 HOURS	1 HOUR	5 MINUTES
	5 MINUTES	9 MONTHS	 4 WEEKS	 6 DAYS	21 HOURS	5 HOURS	25 MINUTES
	30 MINUTES		6 MONTHS	 5 WEEKS	 5 DAYS	 1 DAY	2 HOURS
	1 HOUR		10 MONTHS	2 MONTHS	 10 DAYS	 2 DAYS	5 HOURS
	6 HOURS				2 MONTHS	 2 WEEKS	 1 DAY
	 1 DAY					 8 WEEKS	 5 DAYS

What are we going to cover today?

- Introduction to terraform
- Building our own provider
- Managing GitHub with Terraform
- Continuous deployment

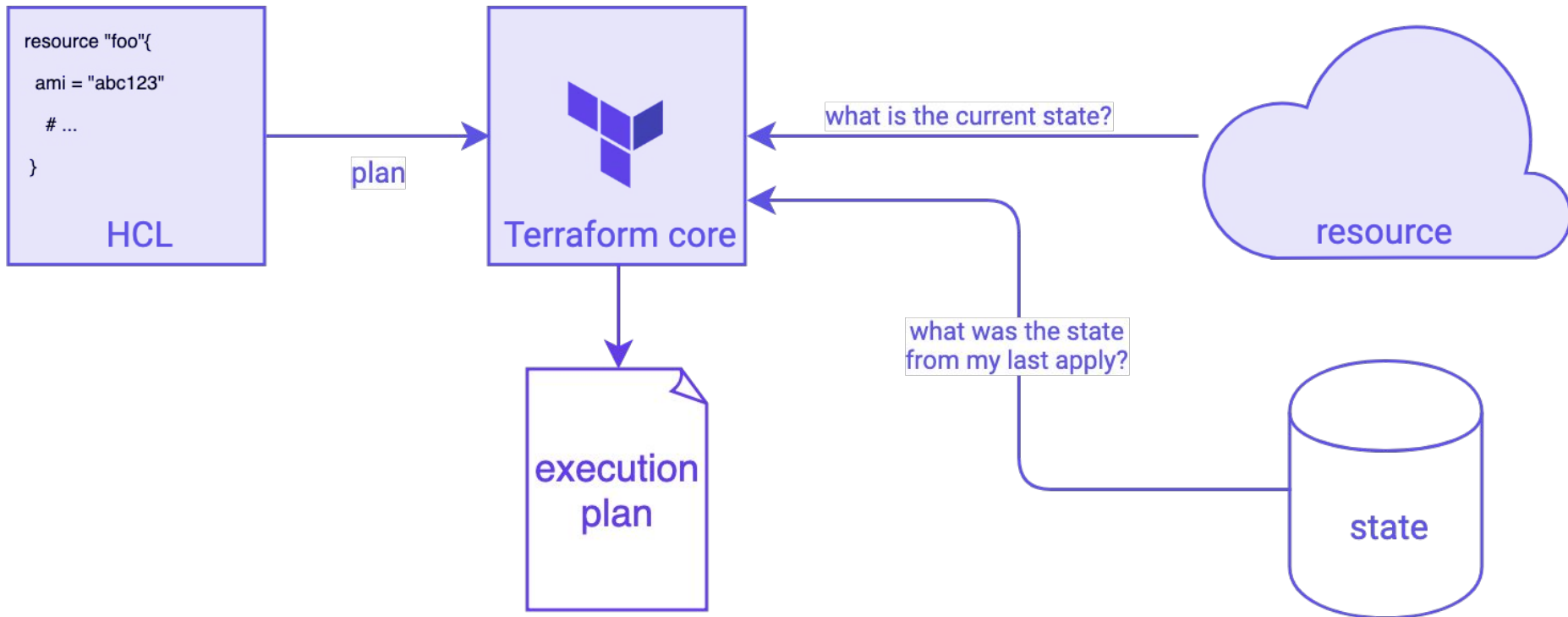


🔥 Live demos 🔥

Tweet @openfaas 📱📷 @ewilde

What is terraform?

Plan phase



Okay?

Helps to evolve you
infrastructure, safely and
predictably

```
googlecalendar_event.give_talk_to_team: Refreshing state... (ID: 4skelhe  
dpa32pilnikm72fbm28)
```

```
An execution plan has been generated and is shown below.  
Resource actions are indicated with the following symbols:  
- destroy
```

```
Terraform will perform the following actions:
```

```
- googlecalendar_event.give_talk_to_team  
- googlecalendar_event.my_goto_talk
```

```
Plan: 0 to add, 0 to change, 2 to destroy.
```

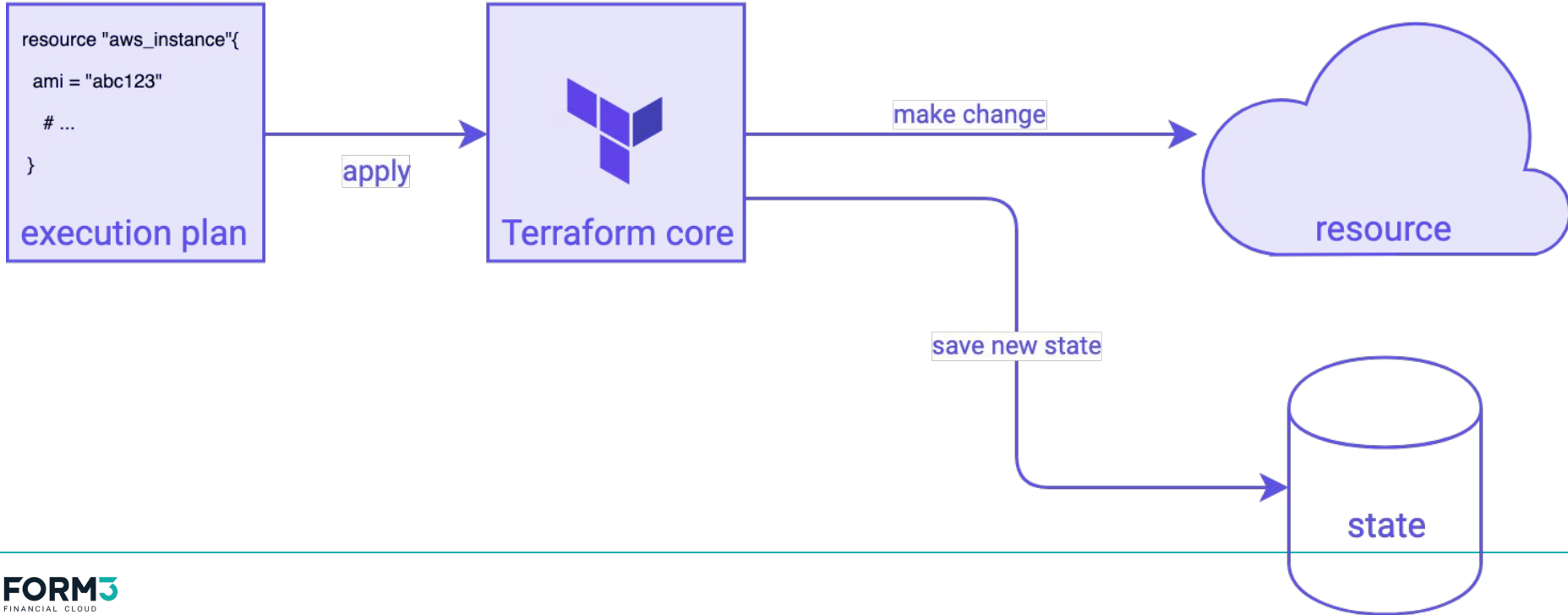
```
Do you really want to destroy all resources?
```

```
Terraform will destroy all your managed infrastructure, as shown above
```

```
There is no undo. Only 'yes' will be accepted to confirm.
```

```
Enter a value: █
```

Apply phase



Let's see it in action!

Review

- Plan
- Apply
- State file

Providers

[Expand all](#)

Terraform CLI

[› Configuration Language](#)[› Commands \(CLI\)](#)[› Import](#)[› State](#)[▼ Providers](#)[• Major Cloud](#)[• Cloud](#)[• Infrastructure Software](#)[• Network](#)[• VCS](#)[• Monitor & System Management](#)[• Database](#)[• Misc.](#)[• Community](#)[› Provisioners](#)[› Modules](#)

Providers

Terraform is used to create, manage, and update infrastructure resources such as physical machines, VMs, network switches, containers, and more. Almost any infrastructure type can be represented as a resource in Terraform.

A provider is responsible for understanding API interactions and exposing resources. Providers generally are an IaaS (e.g. AWS, GCP, Microsoft Azure, OpenStack), PaaS (e.g. Heroku), or SaaS services (e.g. Terraform Enterprise, DNSimple, CloudFlare).

Use the navigation to the left to find available providers by type or scroll down to see all providers.

- [ACME](#)
- [Alicloud](#)
- [Archive](#)
- [Arukas](#)
- [AWS](#)
- [Azure](#)
- [Azure Active Directory](#)
- [Grafana](#)
- [Hedvig](#)
- [Helm](#)
- [Heroku](#)
- [Hetzner Cloud](#)
- [HTTP](#)
- [HuaweiCloud](#)
- [Packet](#)
- [PagerDuty](#)
- [Palo Alto Networks](#)
- [PostgreSQL](#)
- [PowerDNS](#)
- [ProfitBricks](#)
- [RabbitMQ](#)

> 100 official providers

Terraform CLI

› Configuration Language

› Commands (CLI)

› Import

› State

▼ Providers

• Major Cloud

• Cloud

• Infrastructure Software

• Network

• VCS

• Monitor & System Management

• Database

• Misc.

• Community

› Provisioners

› Modules

› Backends

Community Providers

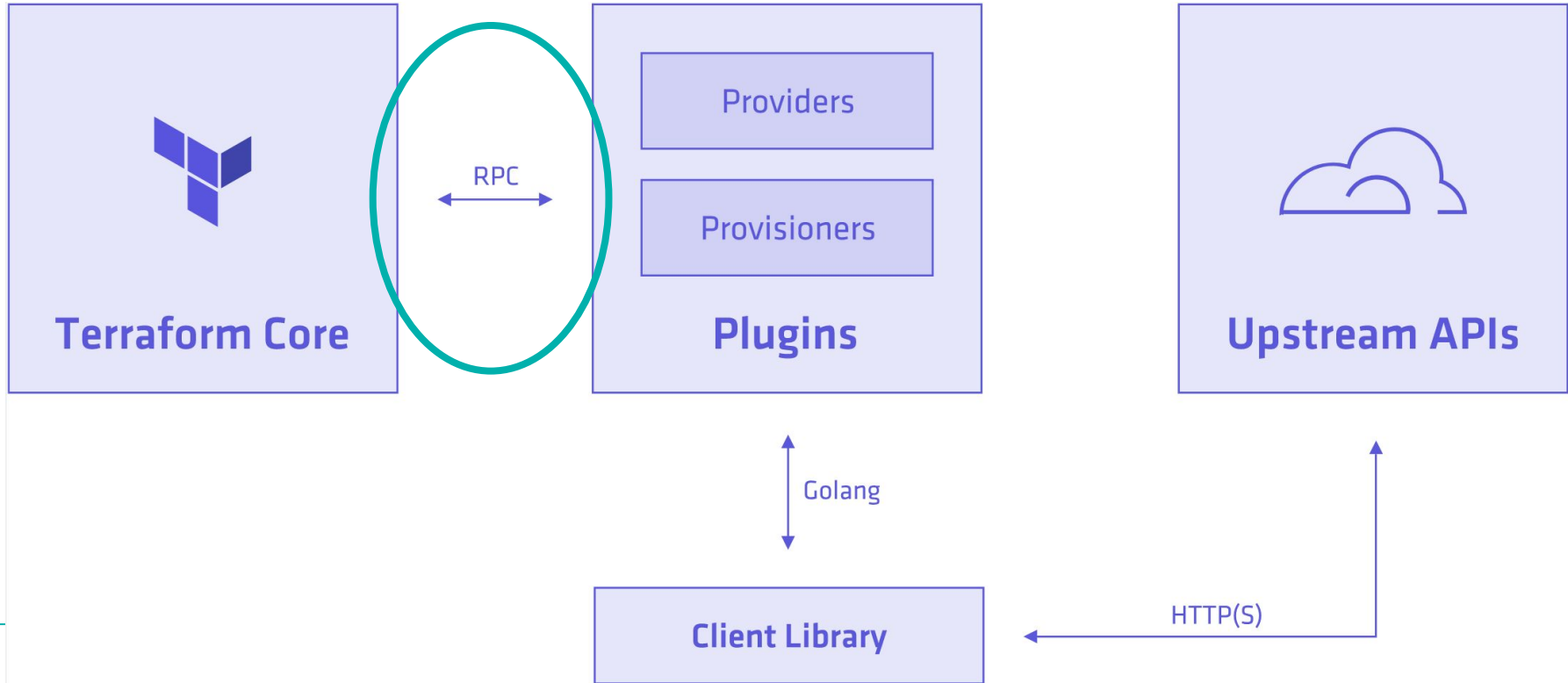
The providers listed below have been built by the community of Terraform users and vendors. These providers are not tested nor officially maintained by HashiCorp, and are listed here in order to help users find them easily.

If you have built a provider and would like to add it to this community list, please fill out this [community providers form](#).

- [Abiquo](#)
- [Active Directory](#)
- [Aiven](#)
- [Apigee](#)
- [Artifactory](#)
- [Auth](#)
- [Auth0](#)
- [AVI](#)
- [Aviatrix](#)
- [AWX](#)
- [GitHub Code Owners](#)
- [Glue](#)
- [GoCD](#)
- [Google Calendar](#)
- [Google G Suite](#)
- [Hiera](#)
- [HP OneView](#)
- [HTTP File Upload](#)
- [IBM Cloud](#)
- [Iij GIO](#)
- [Proxmox](#)
- [Puppet CA](#)
- [PuppetDB](#)
- [QingCloud](#)
- [Redshift](#)
- [RKE](#)
- [Rollbar](#)
- [SakuraCloud](#)
- [SCVMM](#)
- [Sensu](#)

~10% contributed by Form3

Provider architecture



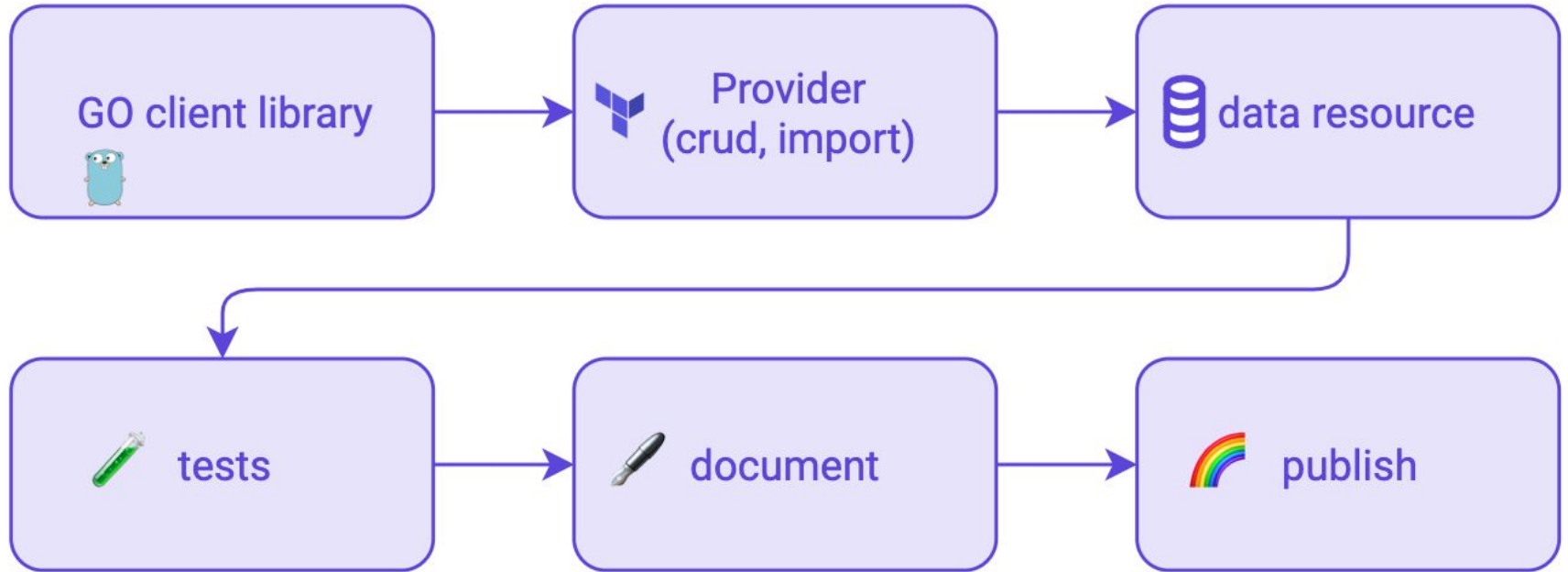
Simple plugin types help you create new providers

```
type Provider struct {  
    Schema map[string]*Schema  
    ResourcesMap map[string]*Resource  
    DataSourcesMap map[string]*Resource  
    ConfigureFunc ConfigureFunc  
}
```

Manages infrastructure resources

```
type Resource struct {  
    Schema map[string]*Schema  
  
    Create CreateFunc  
    Read   ReadFunc  
    Update UpdateFunc  
    Delete DeleteFunc  
    Importer *ResourceImporter  
    Timeouts *ResourceTimeout  
}
```

Provider development workflow



OpenFaaS provider demo

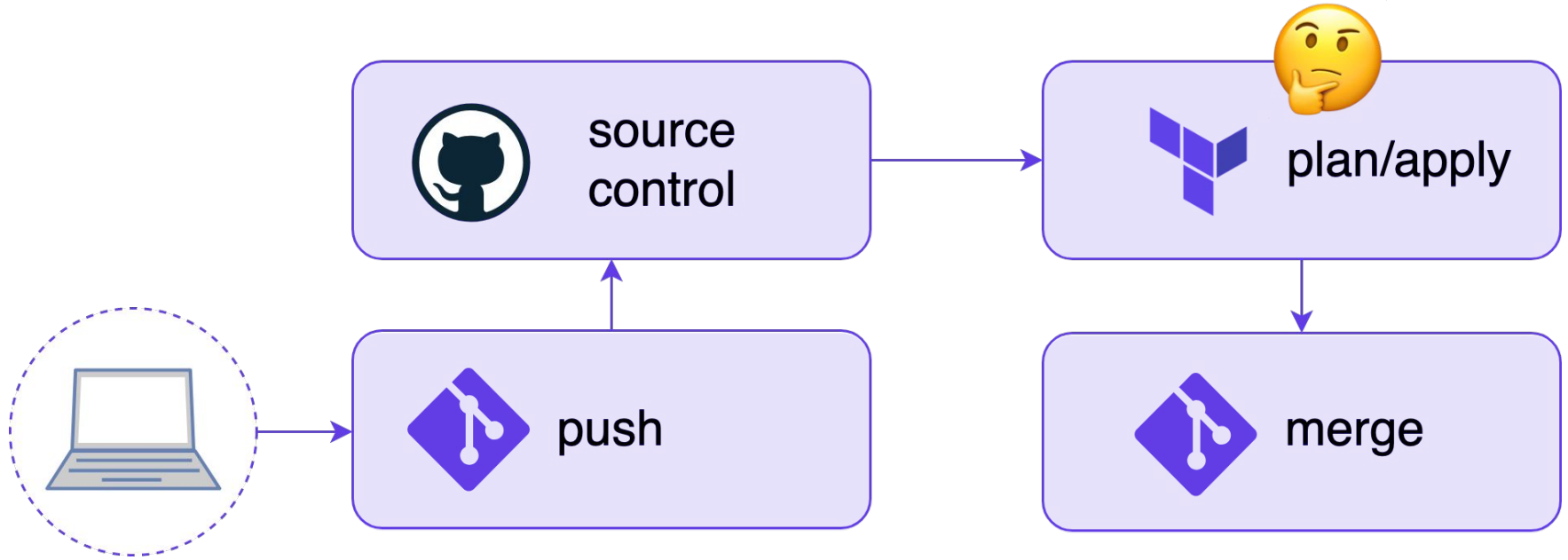
Review

- Provider config
- Resources
- Testing

Useful core Terraform golang packages

Acctest	Random strings, certificates
Encryption	GPG helpers
Logging	Level, correct log output
Schema	Provider and resource related structures
Validation	Pre-canned functions to help you validate schema attributes

Deployment workflow



Continuous deployment

- Atlantis
- Terraform Enterprise



+



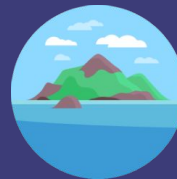
Let's see it in action

Wrapping up

- Terraform
 - Manage complex infrastructure
 - Get access to popular providers
 - Extend your own with ease
- Automate your processes
 - Security / compliance
 - Growing your team

Get started today!

Other useful tools



- Writing custom providers <https://www.terraform.io/docs/extend/writing-custom-providers.html>
- Terraform golang packages <https://github.com/hashicorp/terraform/tree/master/helper>
- OpenFaaS Provider <https://github.com/ewilde/terraform-provider-openfaas>
- Atlantis <https://www.runatlantis.io/>
- Terraform enterprise <https://www.hashicorp.com/products/terraform/enterprise>
- Terraform-docs <https://github.com/segmentio/terraform-docs/>
- Blast radius <https://github.com/28mm/blast-radius>
- Tfenv <https://github.com/tfutils/tfenv>
- Example code from talk <https://github.com/12factor-io/goto-terraform>