



Applying IaC Best Practices with Terraform

Colin Tessarzick
Cloud Backend Engineer at cosee



**I DON'T USUALLY CREATE
INFRA, BUT WHEN I DO**

I USE TERRAFORM

memegenerator.es

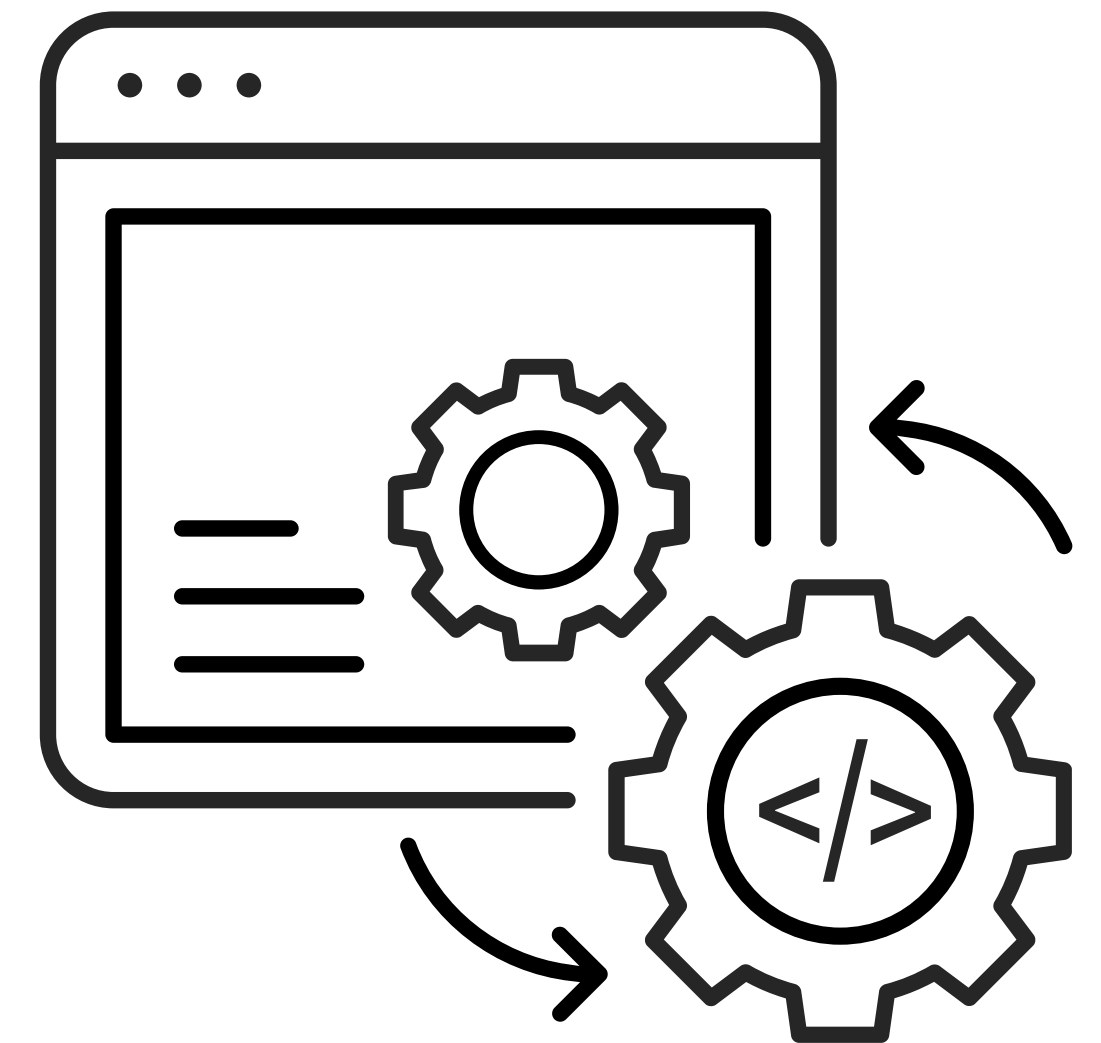
What is Infrastructure as
Code?

Infrastructure as Code:

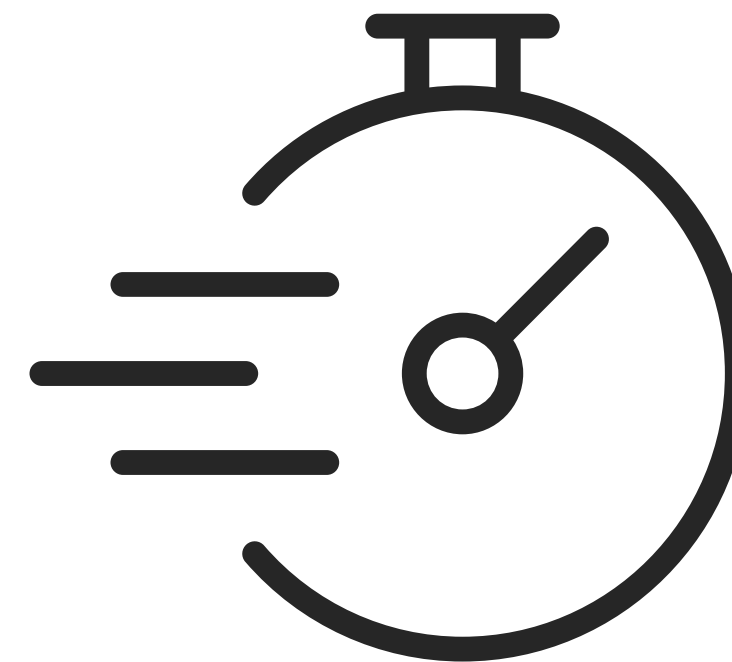
Approach to infrastructure automation based on practices from software development. It emphasises consistent, repeatable routines for provisioning and changing systems and their configuration. You make changes to code, then use automation to test and apply those changes to your systems.

“We don’t make changes often enough
to justify automating them”

**“We should build first and
automate later”**

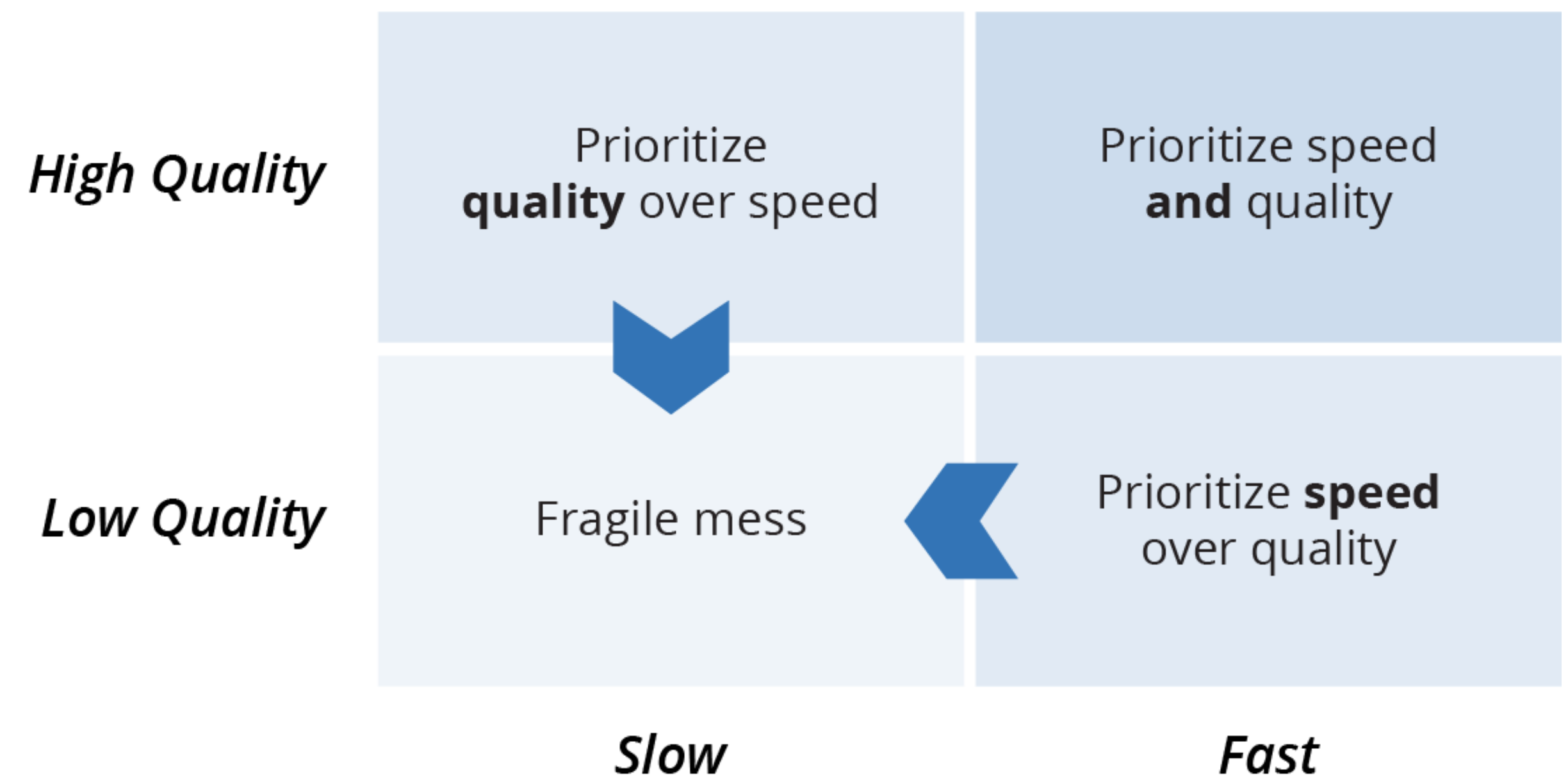


**“We must choose between speed
and quality”**

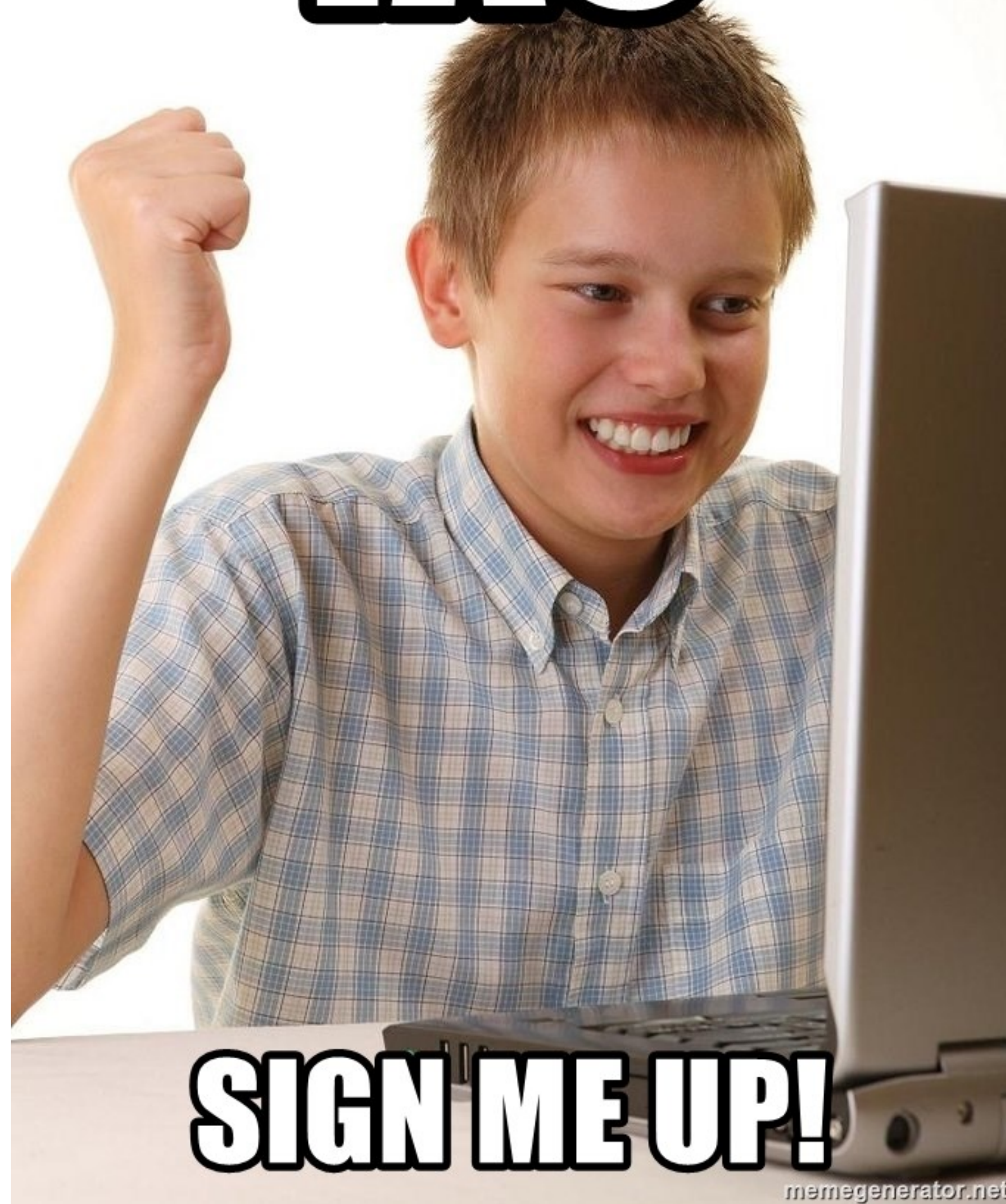


Four Key Metrics:

1. Delivery lead time
2. Deployment frequency
3. Change fail percentage
4. Mean time to Restore (MTTR)



IAG



SIGN ME UP!

What is Terraform?

Open-source tool

to define both cloud and on-prem resources

in human-readable configuration files

that you can version, reuse, and share.

Open-source tool

to define both cloud and on-prem resources in human-readable configuration files that you can version, reuse, and share.



main 395 branches 255 tags

Go to file Code

About

Terraform enables you to safely and predictably create, change, and improve infrastructure. It is an open source tool that codifies APIs into declarative configuration files that can be shared amongst team members, treated as code, edited, reviewed, and versioned.

www.terraform.io/

- cloud graph terraform cloud-management infrastructure-as-code

- Readme MPL-2.0 license Code of conduct 34.3k stars 1.2k watching 7.9k forks

Releases 224

v1.3.0 Latest 2 days ago

+ 223 releases

Table with columns for commit author, message, commit hash, time, and commit count. Includes entries for folders like .github, .release, docs, internal, scripts, tools, version, website and files like .gitignore, .go-version, .tfdev, BUGPROCESS.md, CHANGELOG.md, CODEOWNERS, Dockerfile, LICENSE, Makefile.

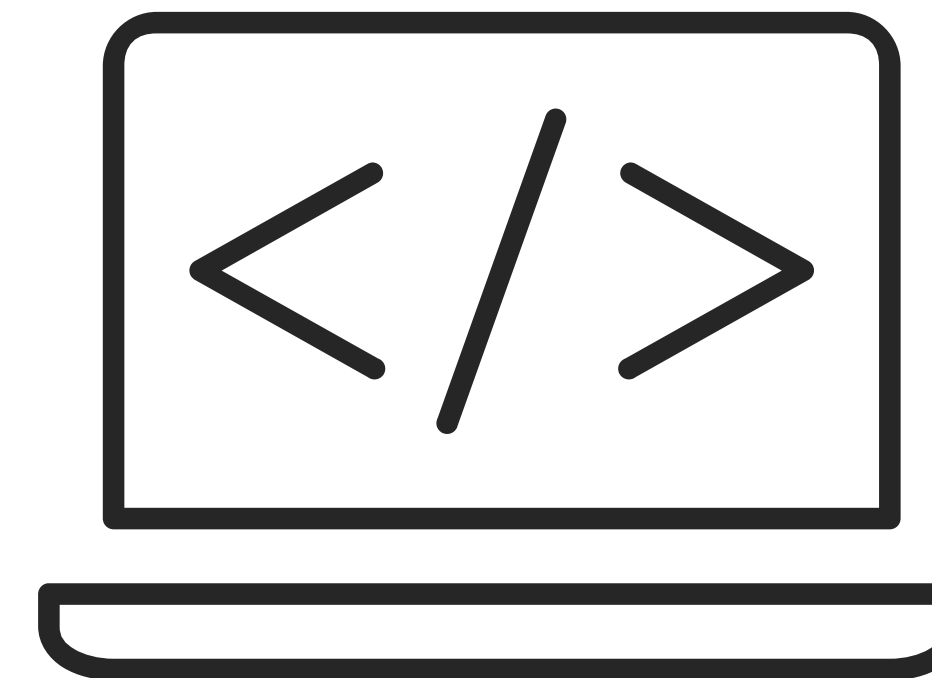
Open-source tool

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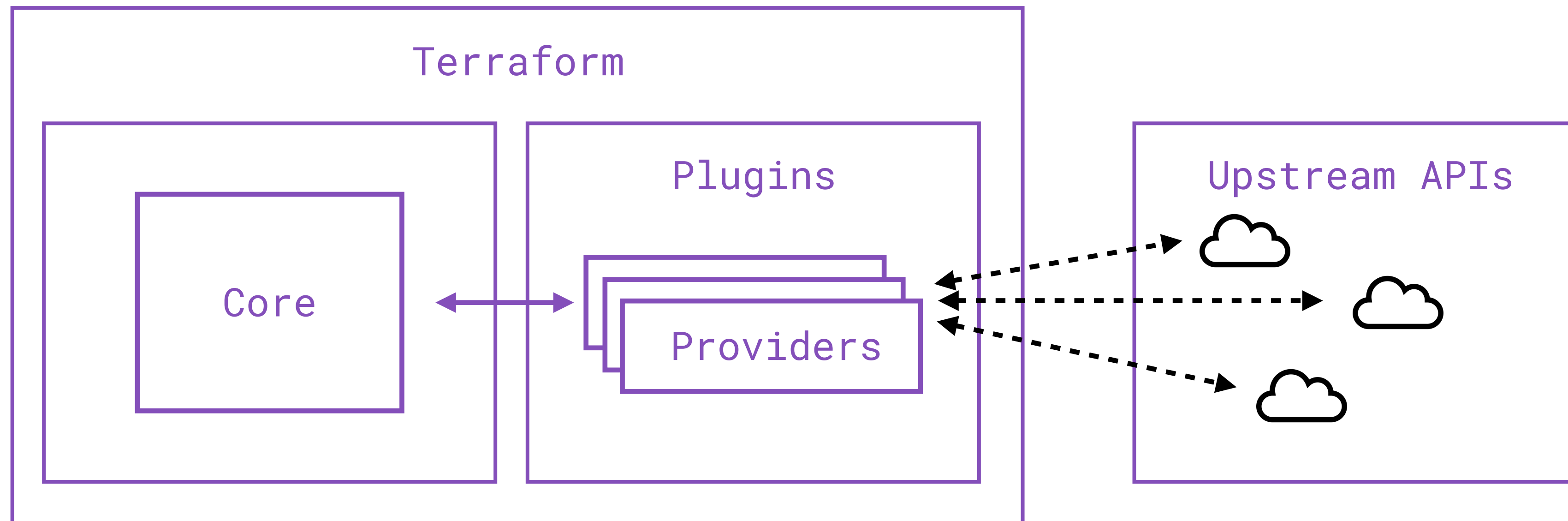
that you can version, reuse, and share.

“Everything as code”



Terraform Architecture:

- Provider/Provisioner Plugins over RPC
- Split into Terraform Core and Terraform Providers





main 70 branches 276 tags

Go to file Code

About

Terraform AWS provider

registry.terraform.io/providers/hashicorp/

aws terraform terraform-provider

Readme

MPL-2.0 license

Code of conduct

7.7k stars

427 watching

7.2k forks

Releases 176

v4.31.0 Latest 8 days ago

+ 175 releases

Used by 34



johnsonaj Merge pull request #26943 from drewmullen/d-orgs-warning...	3c691a0 17 hours ago	55,823 commits
.changelog	Merge pull request #26866 from skyscrapr/f-aws-outpost-eks-local-...	17 hours ago
.ci	Run 'go get github.com/terraform-linters/tflint@v0.39.3'.	14 days ago
.github	fix: preserve bug label on issues from bug template	2 days ago
.release	Necessary bits to onboard project to the Releases API	5 months ago
.teamcity	ci: TeamCity possible	14 days ago
docs	Adds Sweepable interface	11 days ago
examples	Fixes markdownlint for examples	last month
infrastructure	build(deps): bump integrations/github in /infrastructure/repository	23 days ago
internal	Merge pull request #26866 from skyscrapr/f-aws-outpost-eks-local-...	17 hours ago
names	Adds rule r/dgryski.semgrep-go.oserrors from Semgrep registry	16 days ago
skaff	skaff: Run 'go mod tidy'.	14 days ago
tools/tfsdk2fw	tools/tfsdk2fw: Start to generate Go structures.	21 days ago
version	provider: Add terraform-provider-aws/VERSION to User-Agent heade...	2 years ago
website	Merge pull request #26943 from drewmullen/d-orgs-warning-sp	17 hours ago
.actrc	Adds validation for generated TeamCity confia	2 months ago



main 71 branches 85 tags

Go to file Code

About

Terraform GitHub provider

www.terraform.io/docs/providers/gith...

github terraform terraform-provider

- Readme
- MIT license
- Code of conduct
- 560 stars
- 39 watching
- 432 forks

Releases 55

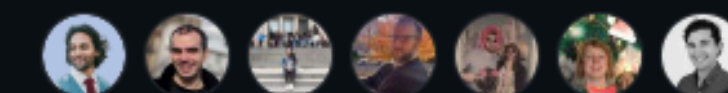
v5.2.0 Latest 3 days ago

+ 54 releases

Packages

No packages published

Contributors 206



	kuhlman-labs and kfcampbell Adding resource github_organization_sett...	759426b 2 days ago	1,075 commits
📁	.github	Switch to Go1.19 in CI check (#1256)	last month
📁	examples	Resource: EMU External Groups Sync (#1094)	5 months ago
📁	github	Adding resource github_organization_settings to provider closes#11...	2 days ago
📁	scripts	Remove gogetcookie.sh (#1292)	4 days ago
📁	vendor	Adding resource github_organization_settings to provider closes#11...	2 days ago
📁	website	Adding resource github_organization_settings to provider closes#11...	2 days ago
📄	.gitignore	Add default binary name to .gitignore (#1237)	2 months ago
📄	.go-version	Bump of Go versions to 1.16 from 1.13/1.14 (#756)	17 months ago
📄	.golangci.yml	update golangci config	3 years ago
📄	.goreleaser.yml	add v4.9.1 changelog entry and project fixes	17 months ago
📄	CHANGELOG.md	Add note deprecating changelog (#1254)	last month
📄	CODE_OF_CONDUCT.md	Update Documentation Ahead Of Project Transfer (#587)	2 years ago
📄	CONTRIBUTING.md	Resource: EMU External Groups Sync (#1094)	5 months ago
📄	GNUmakefile	Switch to Go1.19 in CI check (#1256)	last month
📄	LICENSE	Change LICENSE To MIT (#591)	2 years ago
📄	README.md	Small README cleanup (#1282)	10 days ago
📄	RELEASE.md	docs: add RELEASE.md	11 months ago

Providers for any service you can think of:

AWS

Packet

Docker

Oracle Cloud

Microsoft Azure

Google Cloud

Fastly

Salesforce

Librato

DigitalOcean

Kubernetes

Hashicorp Vault

GitHub

Heroku

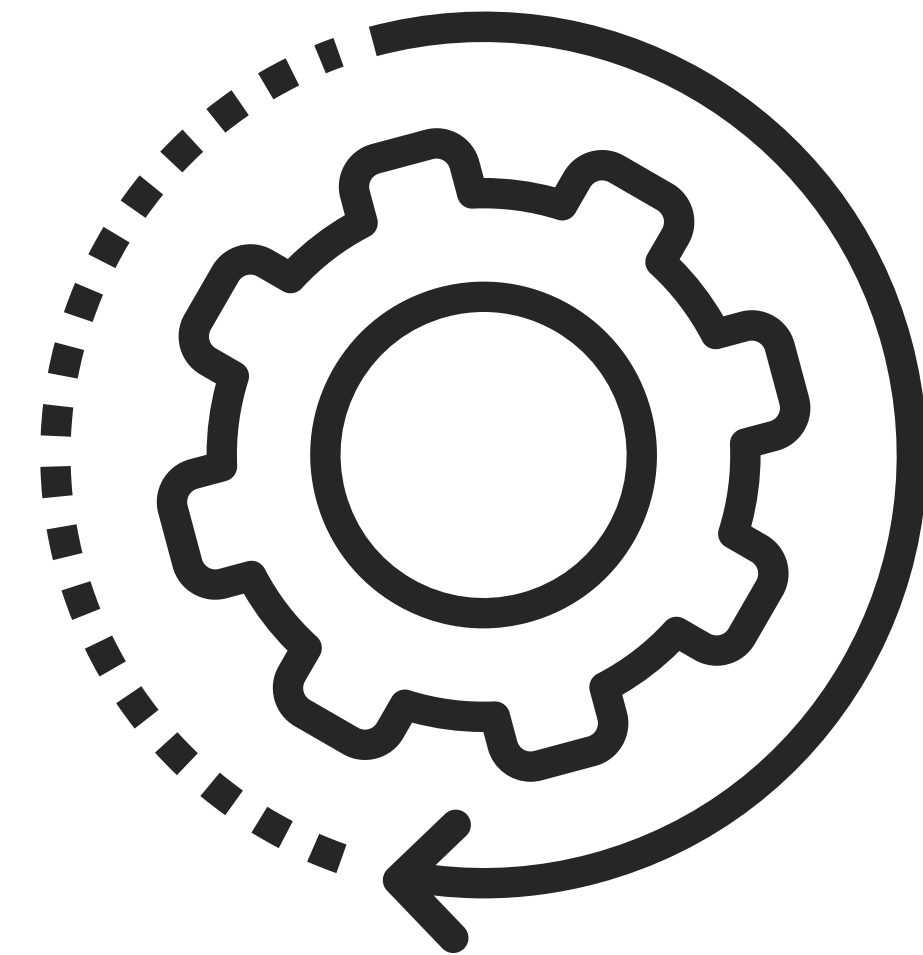
Alibaba Cloud

Terraform Cloud

Many more ...

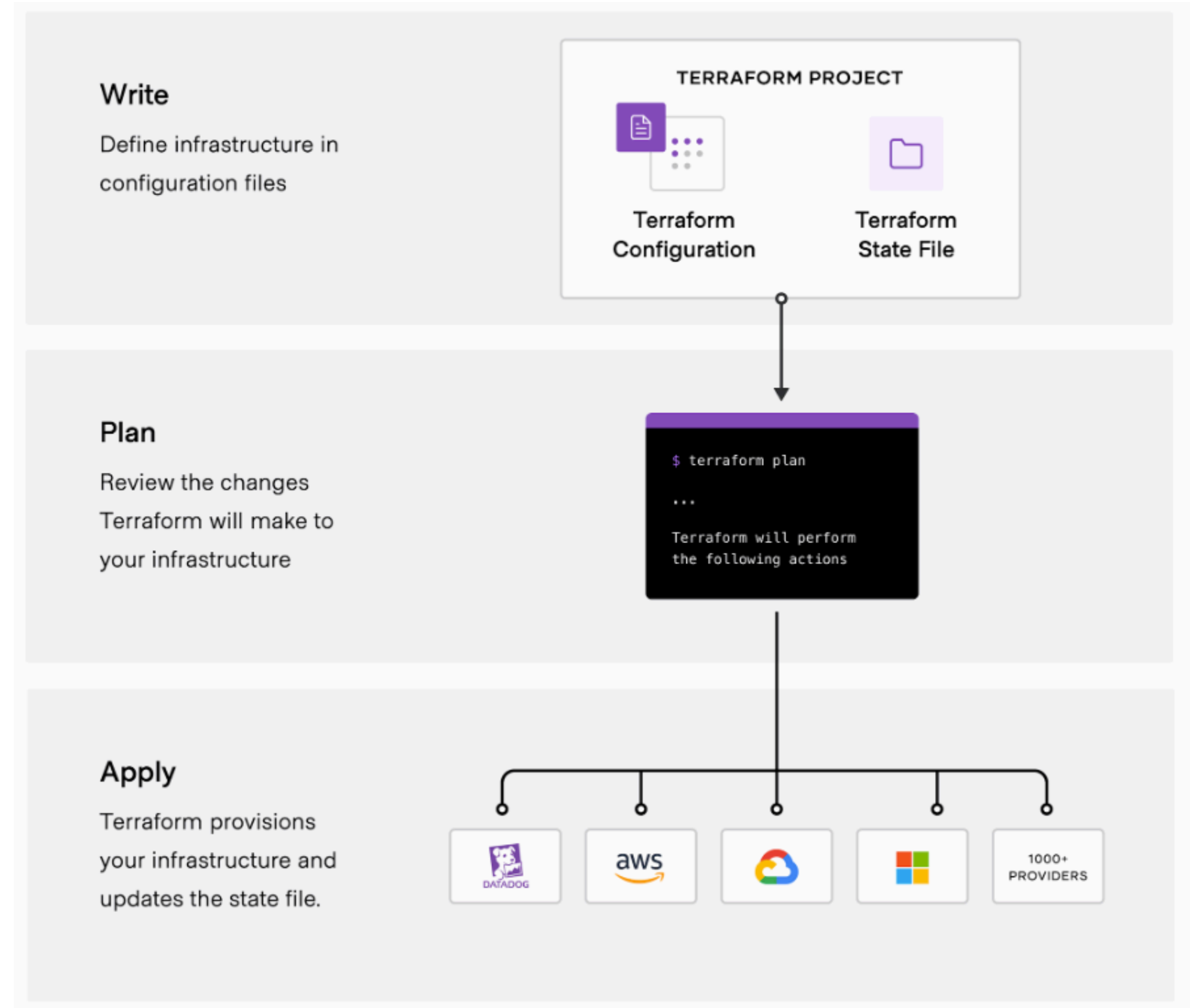
Open-source tool
to define both cloud and on-prem resources
in human-readable configuration files
that you can version, reuse, and share.

**Continuously test & deliver all work
in progress**



The idea is

**to build quality in
rather than trying
to test quality in**



```
1  resource "aws_s3_bucket" "web_application" {
2    bucket = local.domain
3  }
4
5  resource "aws_s3_bucket_website_configuration" "web_application" {
6    bucket = aws_s3_bucket.web_application.id
7
8    index_document {
9      suffix = "index.html"
10   }
11   error_document {
12     key = "index.html"
13   }
14 }
15
16 resource "aws_s3_bucket_acl" "web_application" {
17   bucket = aws_s3_bucket.web_application.id
```

Terraform module which creates VPC resources on AWS 🇺🇦

registry.terraform.io/modules/terraformor...

[aws](#) [vpc](#) [aws-vpc](#)
[terraform-module](#)


- 📖 Readme
- 📄 Apache-2.0 license
- 📄 Code of conduct
- ★ 2.4k stars
- 👁 78 watching
- 🍴 3.5k forks

Releases 17


 **v3.14.4** Latest
20 days ago

[+ 16 releases](#)

Sponsor this project

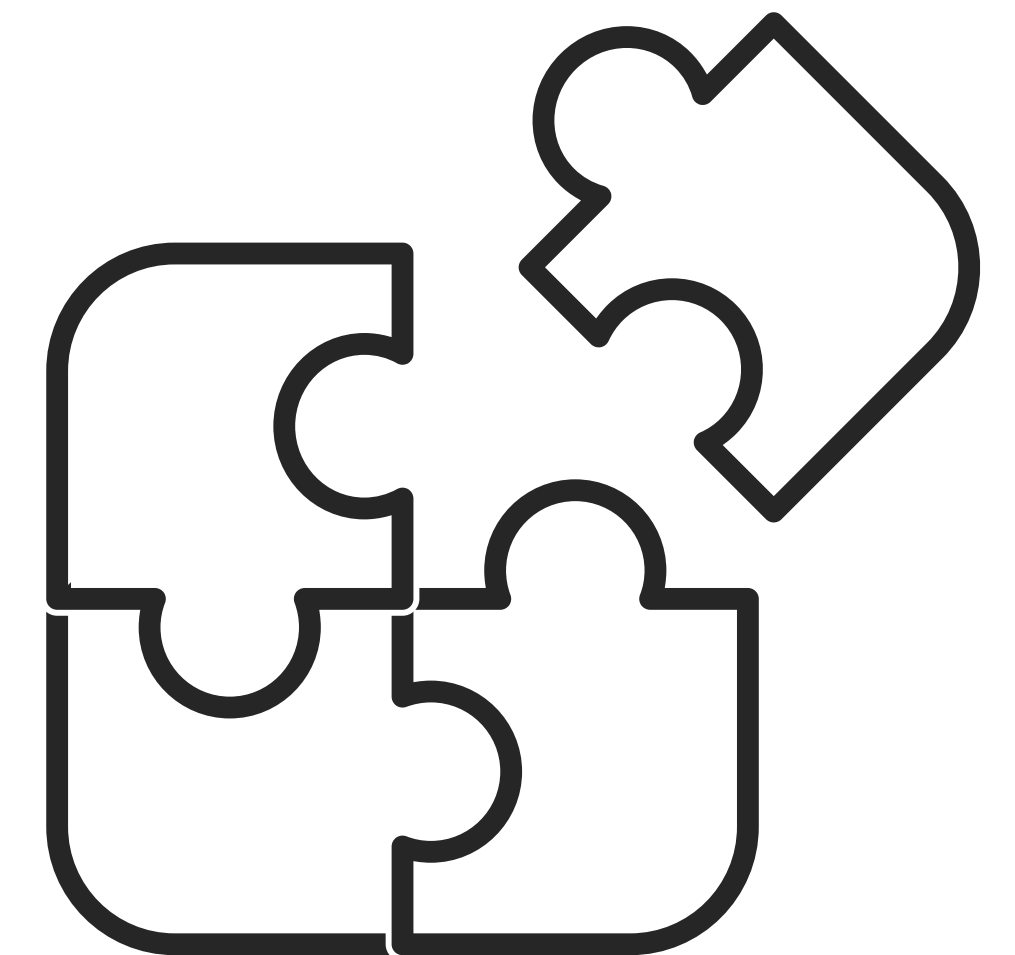
 **antonbabenko** Anton Babenko 

<https://www.paypal.me/antonbabenko>

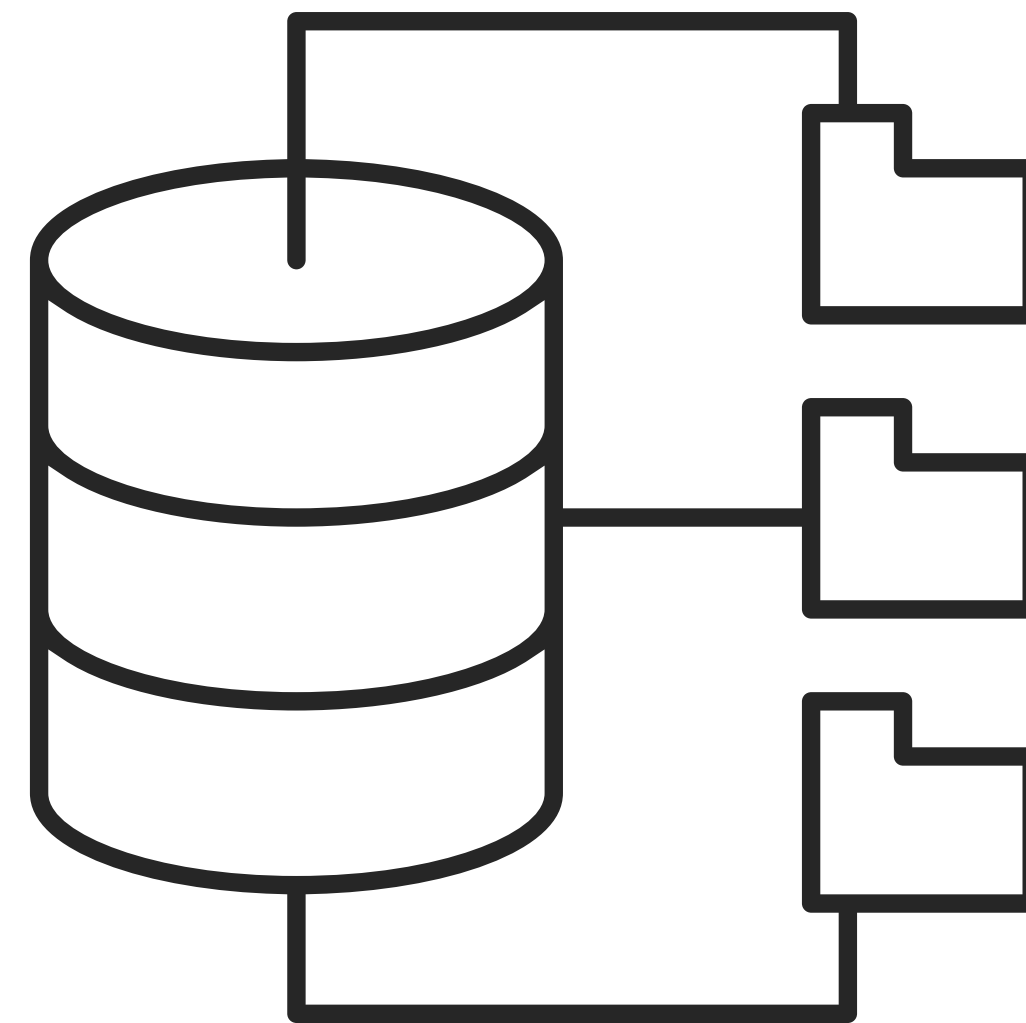
	ag-adampike docs: Fix broken link in default VPC example readme (#827) ...	a06dd17 14 days ago	🕒 400 commits
📁 .github	chore: Update release configuration files to correctly use convention...		9 months ago
📁 examples	docs: Fix broken link in default VPC example readme (#827)		14 days ago
📁 modules/vpc-endpoints	fix: Allow <code>security_group_ids</code> to take <code>null</code> values (#825)		23 days ago
📄 .editorconfig	[ci skip] Create ".editorconfig".		3 years ago
📄 .gitignore	chore: update documentation based on latest <code>terraform-docs</code> whic...		2 years ago
📄 .pre-commit-config.yaml	fix: Compact CIDR block outputs to avoid empty diffs (#802)		3 months ago
📄 .releaserc.json	chore: Update release configuration files to correctly use convention...		9 months ago
📄 CHANGELOG.md	chore(release): version 3.14.4 [skip ci]		20 days ago
📄 LICENSE	chore: update CI/CD to use stable <code>terraform-docs</code> release artifact ...		17 months ago
📄 README.md	fix: Remove EC2-classic deprecation warnings by hardcoding classicl...		20 days ago
📄 UPGRADE-3.0.md	refactor: remove existing vpc endpoint configurations from base mo...		17 months ago
📄 main.tf	fix: Remove EC2-classic deprecation warnings by hardcoding classicl...		20 days ago
📄 outputs.tf	fix: Compact CIDR block outputs to avoid empty diffs (#802)		3 months ago
📄 variables.tf	fix: Remove EC2-classic deprecation warnings by hardcoding classicl...		20 days ago
📄 versions.tf	feat: Added support for VPC Flow Logs in Parquet format (#700)		12 months ago
📄 vpc-flow-logs.tf	feat: Add tags to VPC flow logs IAM policy (#706)		11 months ago

Open-source tool
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Build small, simple pieces that you
can change independently



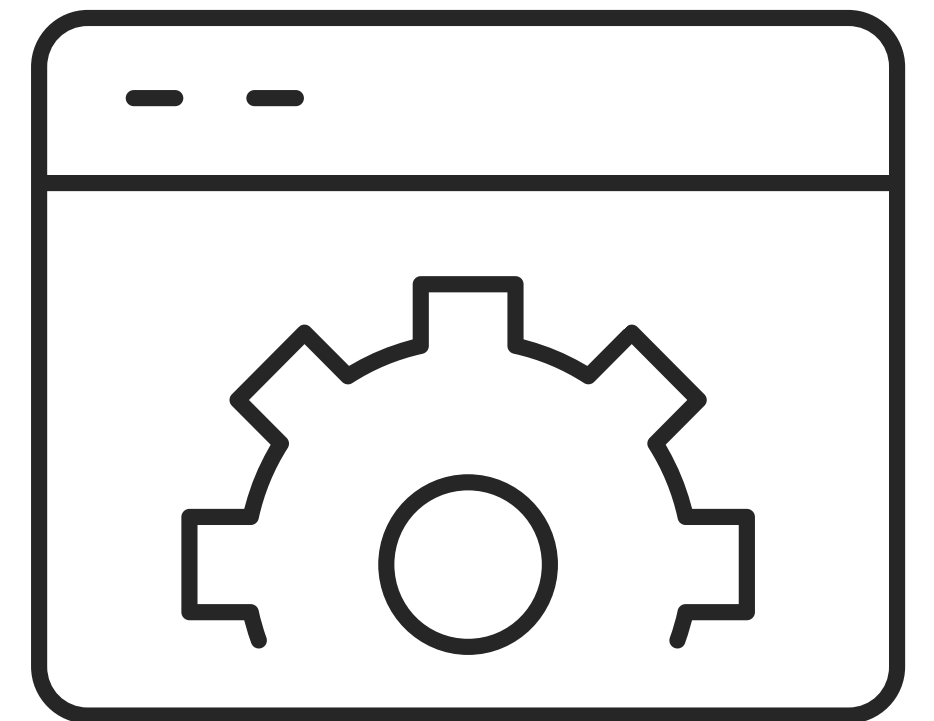
Code Repositories



Terraform State Management:

- Dependency graph
- Refresh prior to any operation
- Primary purpose is to store bindings between resources
- Remote locking to prevent concurrent runs

Software Engineering Practices



Terraform module which creates VPC resources on AWS 🇺🇦

registry.terraform.io/modules/terraformfor...

[aws](#) [vpc](#) [aws-vpc](#)
[terraform-module](#)


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20 days ago

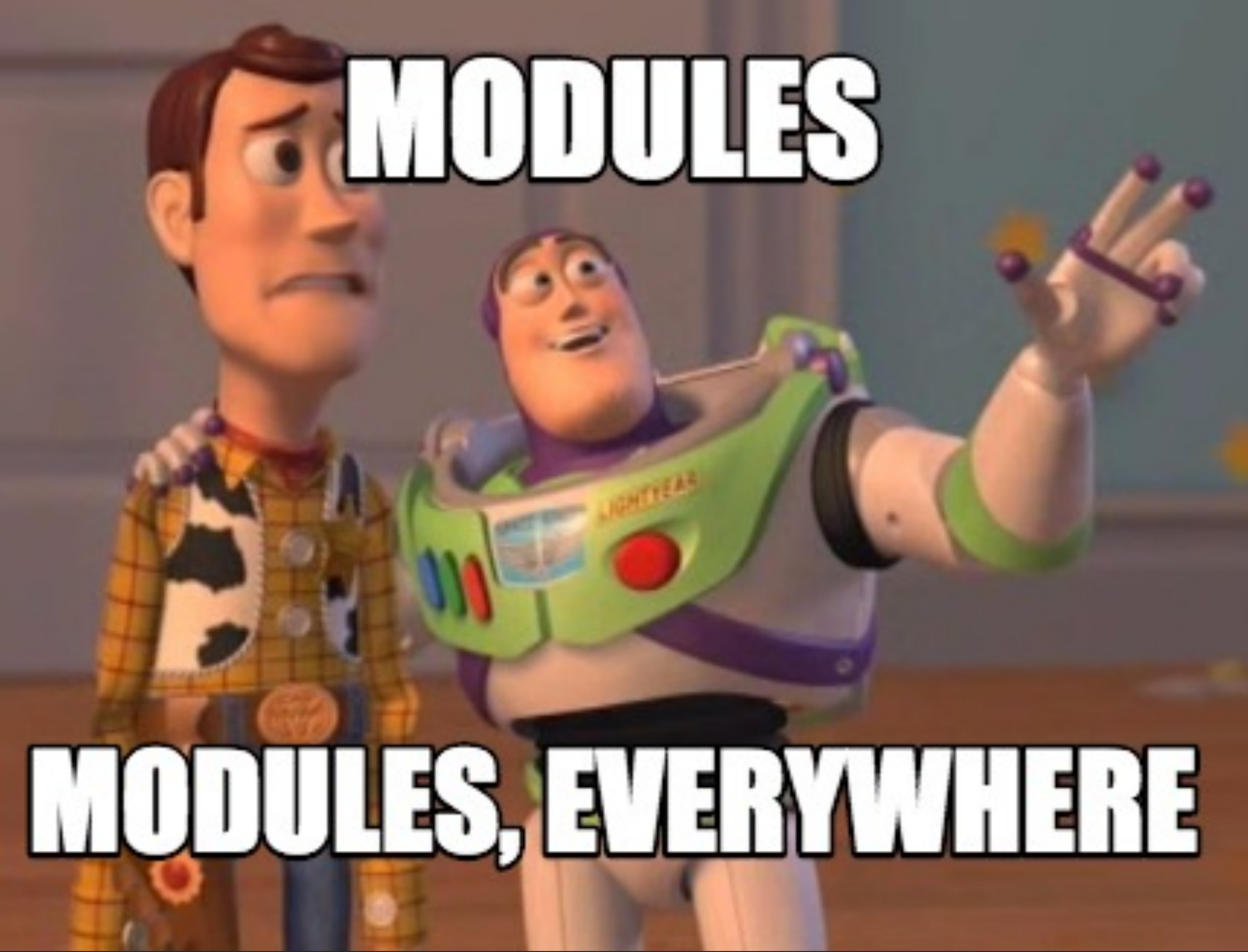
+ 16 releases

Sponsor this project

 **antonbabenko** Anton Babenko 

<https://www.paypal.me/antonbabenko>

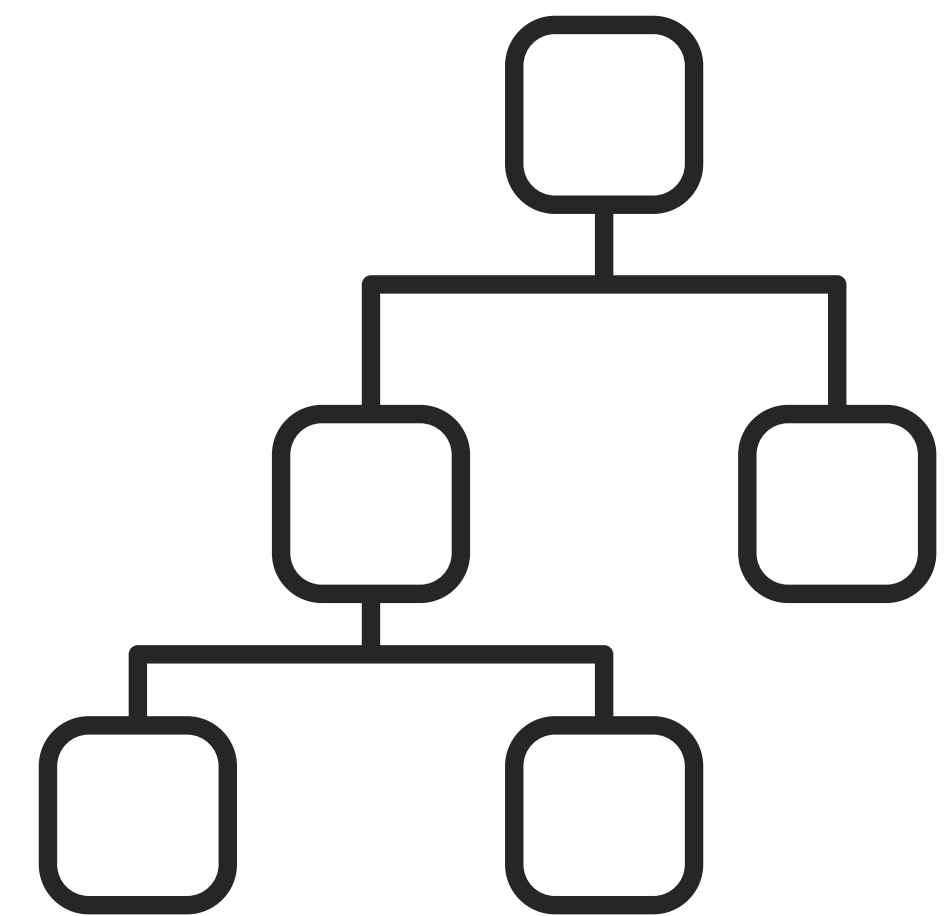
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MODULES

MODULES, EVERYWHERE

Service Oriented Architecture



Terraform Registry

Discover Terraform providers that power all of Terraform's resource types, or find modules for quickly deploying common infrastructure configurations.

 Browse Providers

 Browse Modules

 Browse Policy Libraries

2497 providers, 10697 modules & counting



Navigation sidebar with icons for search, help, and user profile.

- Manage
- Workspaces
- Registry**
- Settings >
- Cloud Platform
- HashiCorp Cloud Platform ↗

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Registry

<> Design configuration

Search public registry

Filter providers and modules

Publish

Providers Modules

No applicable filters available

-  **archive**
by hashicorp
Public 2.2.0 a year ago 59.3M
-  **aws**
by hashicorp
Public 4.32.0 2 days ago 759.1K
-  **github**
by integrations
Public 5.3.0 2 days ago 6.2K



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