

Engineering Kiosk Alps

Decentralization of
infrastructure and DevOps
tasks to the whole team

Back in the days

Back in the days



Team

- Small team with 2-4 members
- Daily touch points
- Mostly everyone on the same project



Infrastructure

- Easy to setup and use
- Smaller applications / low traffic
- Limited access to only certain members

Back in the days

Infrastructure Setup:

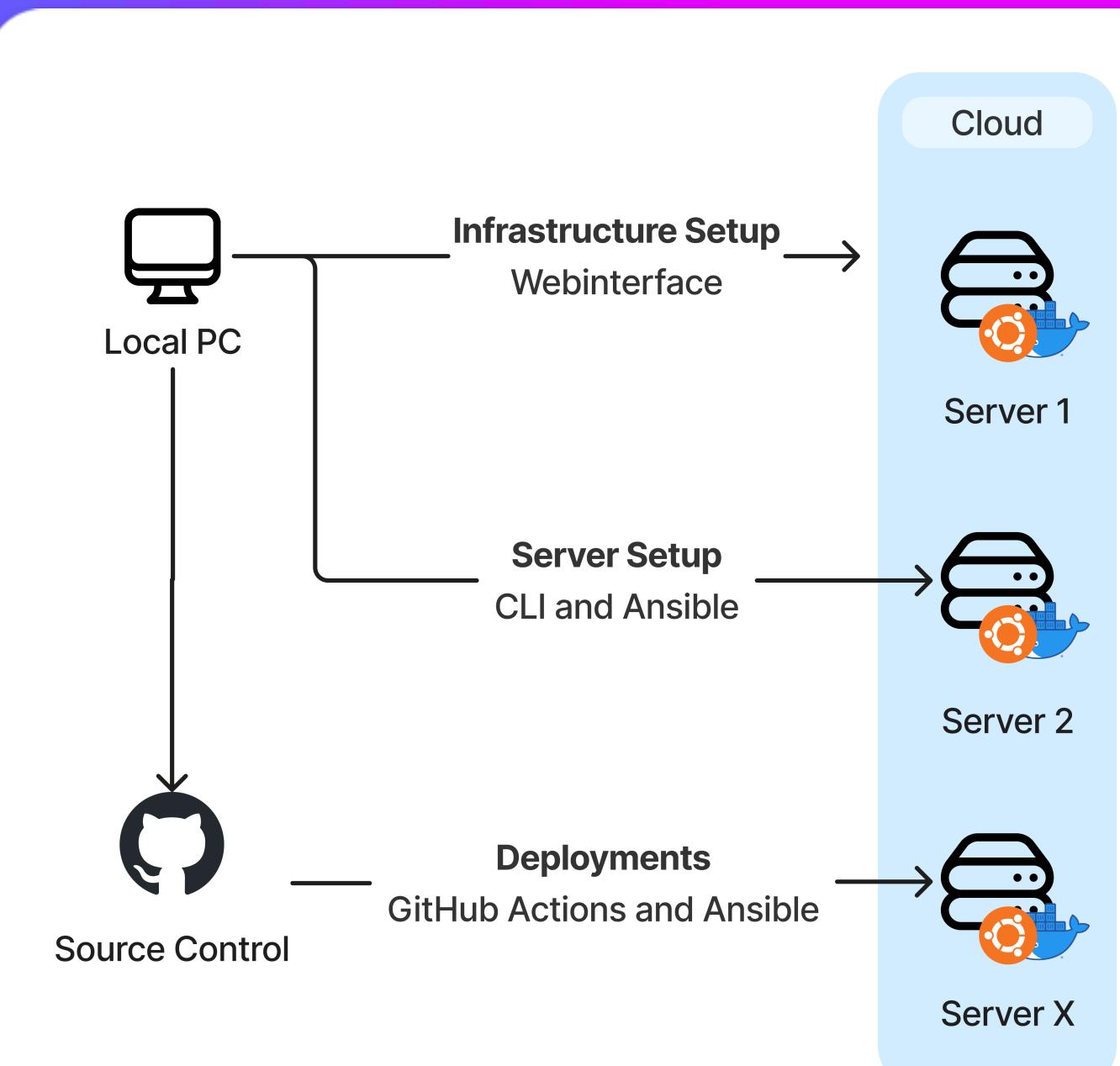
- Manually using web interface

Server Setup:

- Stored in a central Git repository
- Executed locally
- Using Ansible Playbooks

Deployments:

- Stored in every project Git repository
- Executed using GitHub Actions
- Using Ansible Playbooks



New challenges

New challenges



Team

- **Bigger team with 8-10 members**
- **Daily touch points often only in stand-ups**
- **Different people on different projects**



Infrastructure

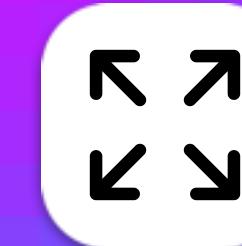
- **More clients and applications**
- **The need of better resource management**
- **The need of better application insights**
- **The need of better scalability**
- **The need of higher security requirements**

Our goals

Our goals



Automated



Decentralized



Documented



Secure



Reviewed



Scalable



Transparent



Restrictable

Terraform

Terraform

Terraform is an **infrastructure as code** tool that enables you to **safely and predictably** provision and manage infrastructure in any cloud.

> *terraform apply*

```
# Dependencies
terraform {
  required_providers {
    digitalocean = {
      source  = "digitalocean/digitalocean"
      version = "2.29.0"
    }
  }
}

# State Storage
terraform {
  backend "s3" {
    ...
  }
}

# Provider Configuration
provider "digitalocean" {
  token = ...
}

# techtalkssouthtyrol.it
resource "digitalocean_domain" "it_techtalkssouthtyrol" {
  name = "techtalkssouthtyrol.it"
}

resource "digitalocean_record" "it_techtalkssouthtyrol_A" {
  domain = digitalocean_domain.it_techtalkssouthtyrol.id
  type   = "A"
  name   = "@"
  value  = "46.101.178.244"
  ttl    = 3600
}
```

Terraform



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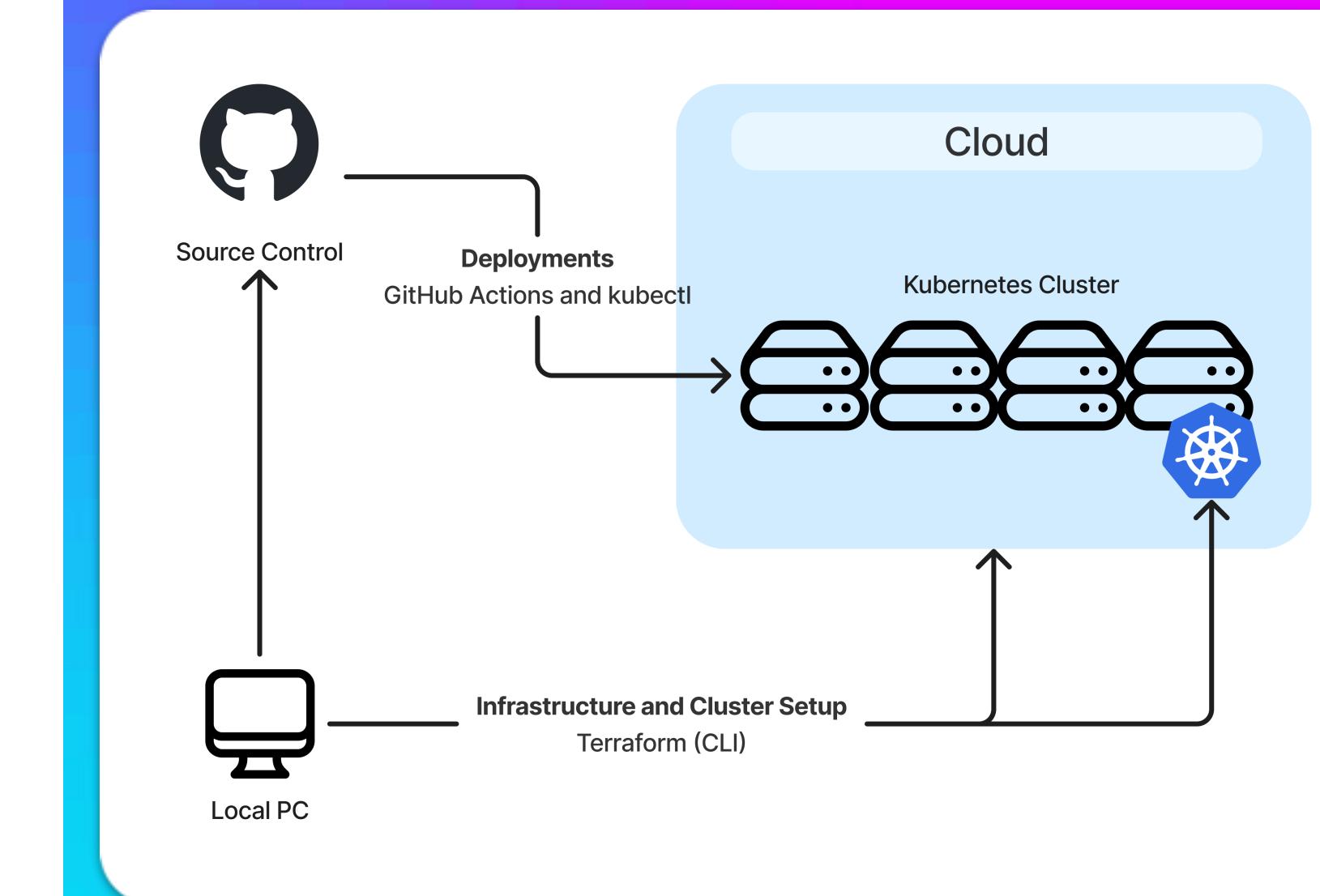
Kubernetes

Kubernetes

Kubernetes is a portable, extensible, open source platform for managing containerized workloads and services, that facilitates both declarative configuration and automation.

Setup:

- Infrastructure configuration using Terraform
- Cluster configuration using Terraform



Kubernetes

Deployments

- Triggered when new code gets pushed
- Executed using GitHub Actions
- Performed using Kubernetes deployments

> *kubectl apply -f deployment.yml*

```
apiVersion: v1
kind: Namespace
metadata:
  name: boilerplate
---
apiVersion: apps/v1
kind: Deployment
metadata:
  namespace: boilerplate
  name: app
spec:
  ...
---
apiVersion: v1
kind: Service
metadata:
  namespace: boilerplate
  name: app
spec:
  ...
---
apiVersion: networking.k8s.io/v1
kind: Ingress
metadata:
  namespace: boilerplate
  name: ingress-app
  annotations:
    cert-manager.io/cluster-issuer: letsencrypt-nginx-aboutbits
spec:
  ...
```

Kubernetes



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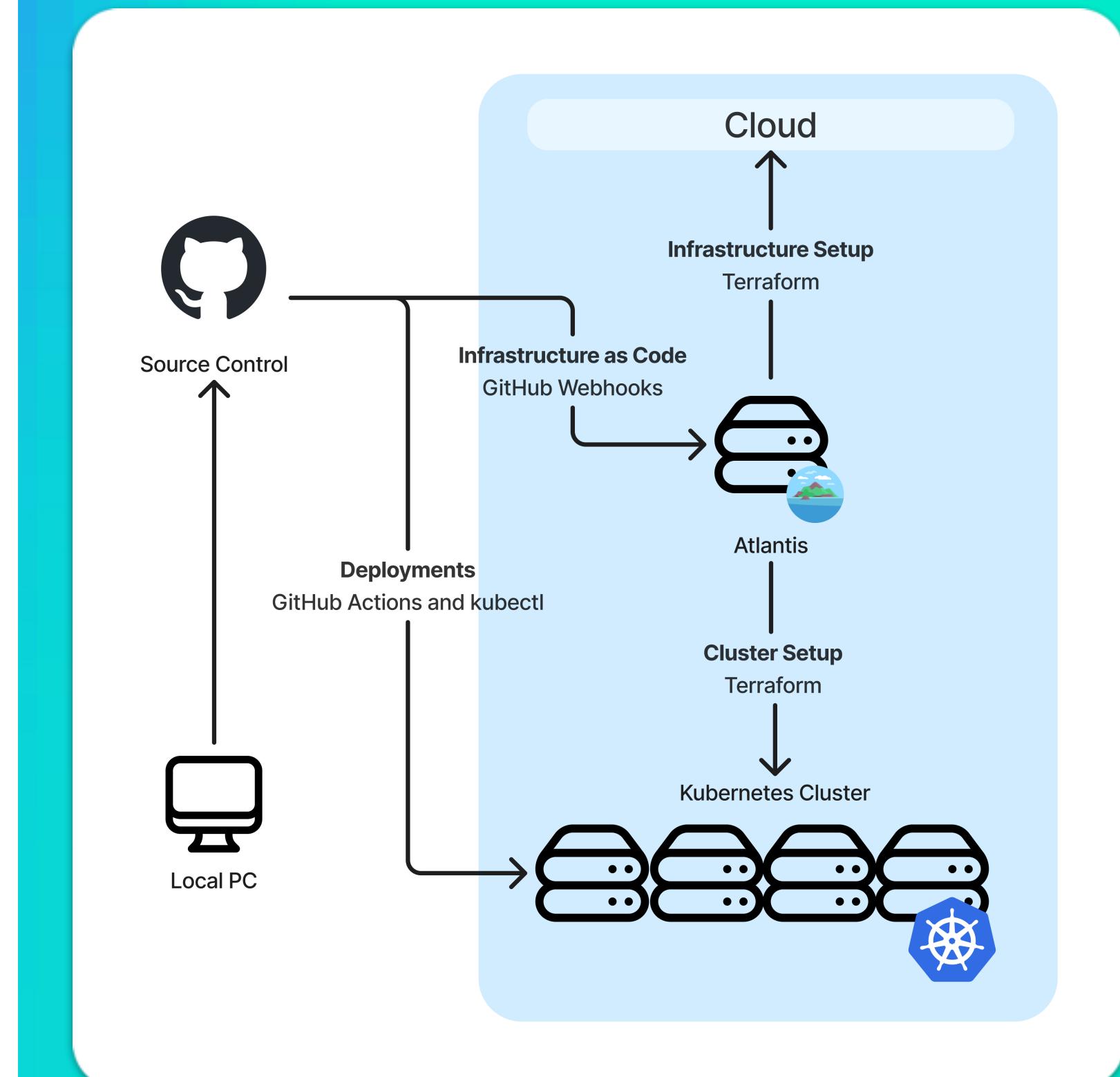
Transparent

Atlantis

Atlantis

Atlantis is an application for **automating Terraform via pull requests**. It is deployed as a standalone application into your infrastructure. **No third-party has access to your credentials.**

- Triggered via GitHub Webhooks
- Execution of Terraform configuration files
- Communication through GitHub Pull Requests



Atlantis

```
resource "digitalocean_record" "it_techtalkssouthtyrol_example_CNAME" {
    domain = digitalocean_domain.it_techtalkssouthtyrol.id
    type   = "CNAME"
    name   = "example"
    value  = "proxy01.aboutbits.cloud."
    ttl    = 3600
}
```

Atlantis

The screenshot shows a GitHub pull request interface for a repository named `aboutbits / infrastructure`. The pull request is titled "Add example.techtalkssouthtyrol.it domain #73". The status bar indicates "Open" and "alexlanz wants to merge 1 commit into `main` from `example`".

Key details from the pull request interface:

- Comments:** alexlanz commented now: "No description provided."
- Commits:** 1 (by alexlanz) titled "add example.techtalkssouthtyrol.it domain" (Verified, bf6b7eb)
- Checks:** 0
- Files changed:** 1
- Reviewers:** No reviews—at least 1 approving review is required. Still in progress? Convert to draft.
- Assignees:** No one—assign yourself.
- Labels:** None yet.
- Projects:** None yet.
- Milestone:** No milestone.
- Notifications:** Customize, Unsubscribe. You're receiving notifications because you authored the thread.
- Participants:** 1 participant.

A modal window at the bottom left displays the following information:

- Code owner review required:** Waiting on code owner review from aboutbits/management. [Learn more about pull request reviews.](#)
- 1 pending reviewer:**
- Some checks haven't completed yet:** 2 pending checks
 - atlantis/plan Pending — Plan in progress...
 - atlantis/plan: infrastructure-digitalocean Pending — Plan in progress...
- Merging is blocked:** Merging can be performed automatically with 1 approving review.

Atlantis

A screenshot of a GitHub pull request interface. At the top, there are tabs for Conversation (0), Commits (1), Checks (0), and Files changed (1). A status bar shows '+8 -0' with green squares. Below the tabs, a comment from user **alexlanz** is shown: "No description provided." A reply from **aboutbits-tech** follows: "Ran Plan for project: `infrastructure-digitalocean` dir: `terraform/infrastructure/digitalocean` workspace: `default`". It includes a link to "Show Output" and a summary: "Plan: 1 to add, 0 to change, 0 to destroy." Below this, instructions for Atlantis are listed:

- ➡ To apply all unapplied plans from this pull request, comment:
 - `atlantis apply`
- ⏪ To delete all plans and locks for the PR, comment:
 - `atlantis unlock`

At the bottom, a note says "Add more commits by pushing to the `example` branch on **aboutbits/infrastructure**". A red warning box at the bottom left states "**Code owner review required**" with the message "Waiting on code owner review from **aboutbits/management**. [Learn more about pull request reviews.](#)". On the right side of the interface, there are sections for Reviewers, Assignees, Labels, Projects, Milestone, Notifications, and 1 participant. A callout bubble on the right side highlights the code owner configuration:

```
# .github/CODEOWNERS
* @aboutbits/management
```

Atlantis

A screenshot of a GitHub pull request interface. The title of the PR is "Add example.techtalkssouthtyrol.it domain #73". It shows a comment from "aboutbits-tech" that includes an output of a Terraform plan. The output details a new CNAME record being created for the domain "techtalkssouthtyrol.it". The Atlantis CI comment provides instructions for applying or deleting the plan.

aboutbits-tech commented now

Ran Plan for project: `infrastructure-digitalocean` dir: `terraform/infrastructure/digitalocean`
workspace: `default`

▼ Show Output

Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
+ `create`

Terraform will perform the following actions:

```
+ resource "digitalocean_record" "it_techtalkssouthtyrol_example_CNAME" {
    + domain = "techtalkssouthtyrol.it"
    + fqdn   = (known after apply)
    + id     = (known after apply)
    + name   = "example"
    + ttl    = 3600
    + type   = "CNAME"
    + value  = "proxy01.aboutbits.cloud."
}
```

Plan: 1 to add, 0 to change, 0 to destroy.

- ▶ To **apply** this plan, comment:
 - atlantis apply -p infrastructure-digitalocean
- ▶ To **delete** this plan click [here](#)
- ▶ To **plan** this project again, comment:
 - atlantis plan -p infrastructure-digitalocean

Plan: 1 to add, 0 to change, 0 to destroy.

- ▶ To **apply** all unapplied plans from this pull request, comment:
 - atlantis apply
- ▶ To **delete** all plans and locks for the PR, comment:
 - atlantis unlock

Labels
None yet

Projects
None yet

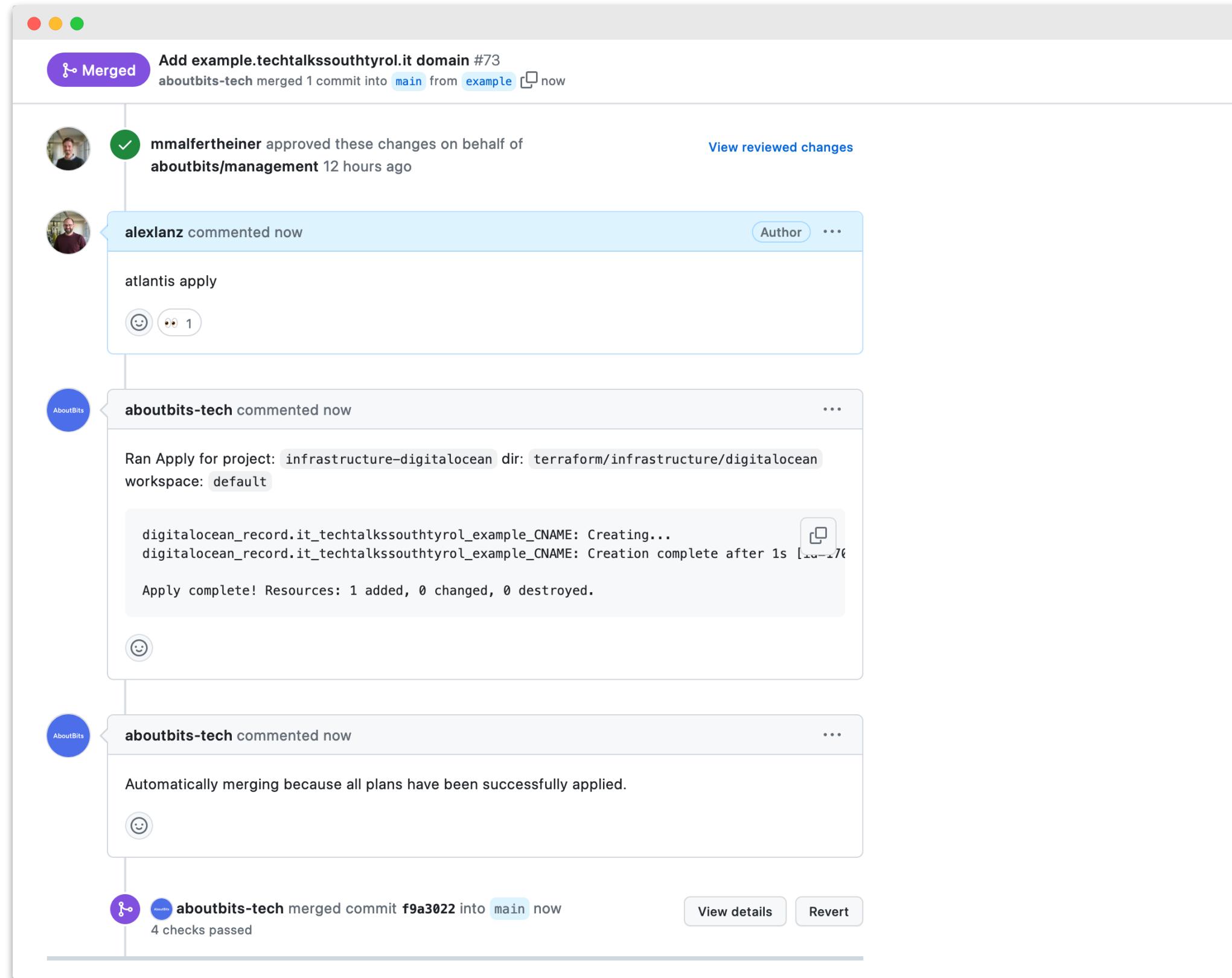
Milestone
No milestone

Notifications [Customize](#)
[Unsubscribe](#)
You're receiving notifications because you authored the thread.

1 participant


[Lock conversation](#)

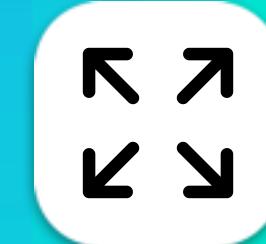
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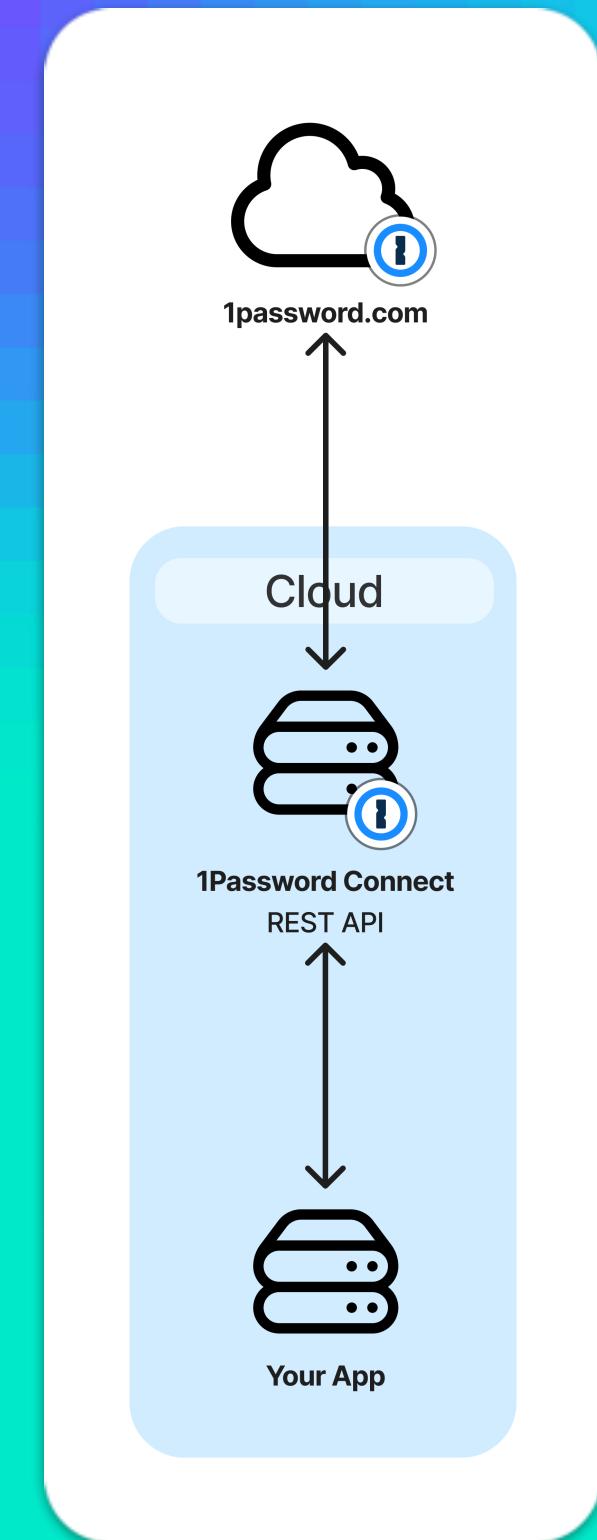


Restrictable

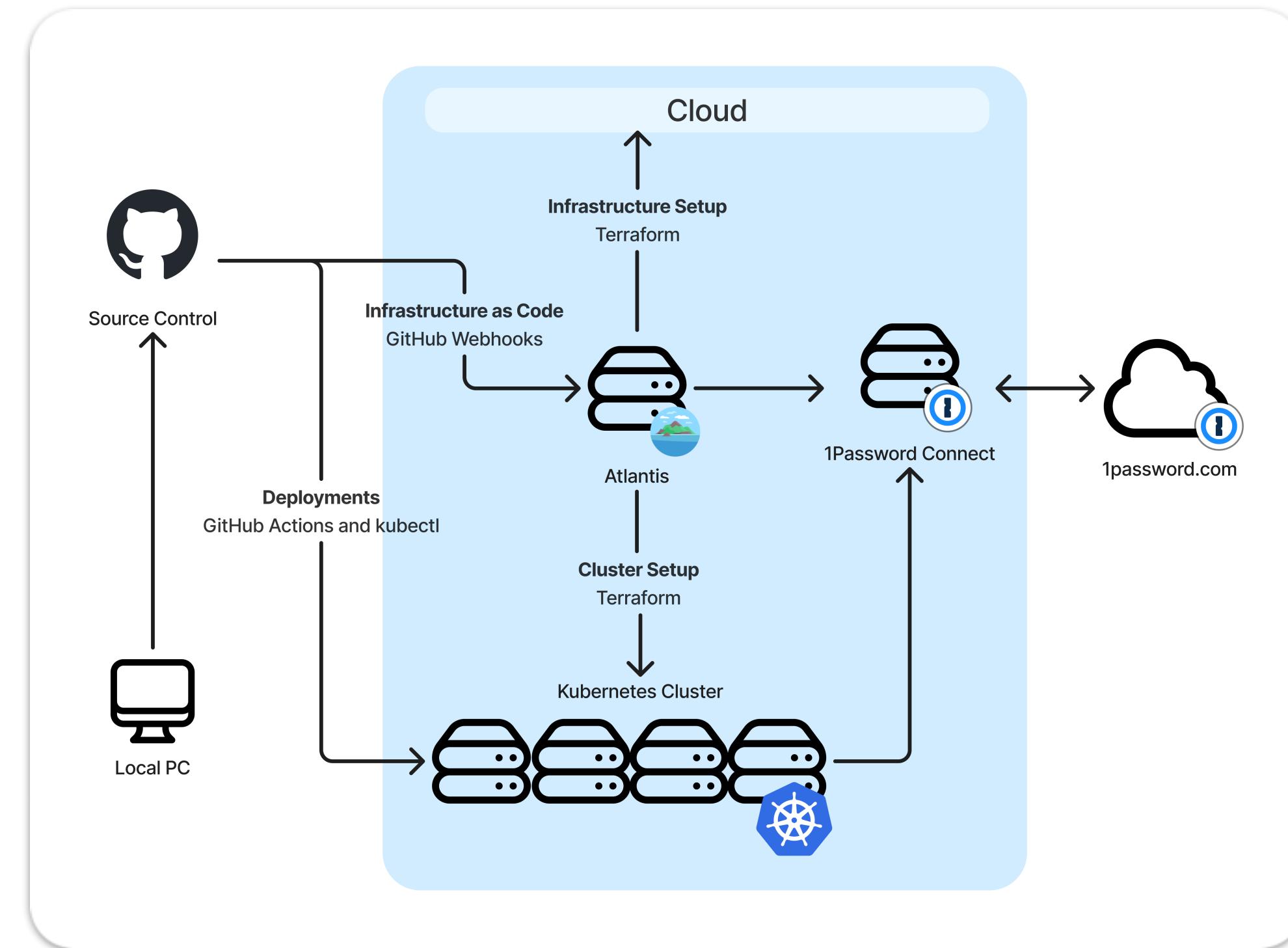
1Password Connect

1Password Connect

With 1Password Connect, you can **securely** access your 1Password items and vaults in your company's apps and cloud infrastructure using a **private REST API**.



1Password Connect



1Password Connect

Terraform

```
# Dependencies
terraform {
  required_providers {
    onepassword = {
      source  = "1password/onepassword"
      version = "1.1.4"
    }
    digitalocean = {
      source  = "digitalocean/digitalocean"
      version = "2.29.0"
    }
  }
}

# Provider Configuration
provider "onepassword" {
  url = "https://1password.infrastructure.aboutbits.cloud"
}

# 1Password Credentials
data "onepassword_vault" "atlantis_vault" {
  name = "Atlantis - General"
}

data "onepassword_item" "digitalocean_access_token" {
  vault = data.onepassword_vault.atlantis_vault.uuid
  title = "DigitalOcean - Access Token"
}

# Example
provider "digitalocean" {
  token = data.onepassword_item.digitalocean_access_token.password
}
```

Kubernetes

```
apiVersion: v1
kind: Namespace
metadata:
  name: boilerplate
---
apiVersion: onepassword.com/v1
kind: OnePasswordItem
metadata:
  namespace: boilerplate
  name: app-secrets
spec:
  itemPath: "vaults/Kubernetes - Test/items/Boilerplate"
---
apiVersion: apps/v1
kind: Deployment
metadata:
  namespace: boilerplate
  name: app
...
```

1Password



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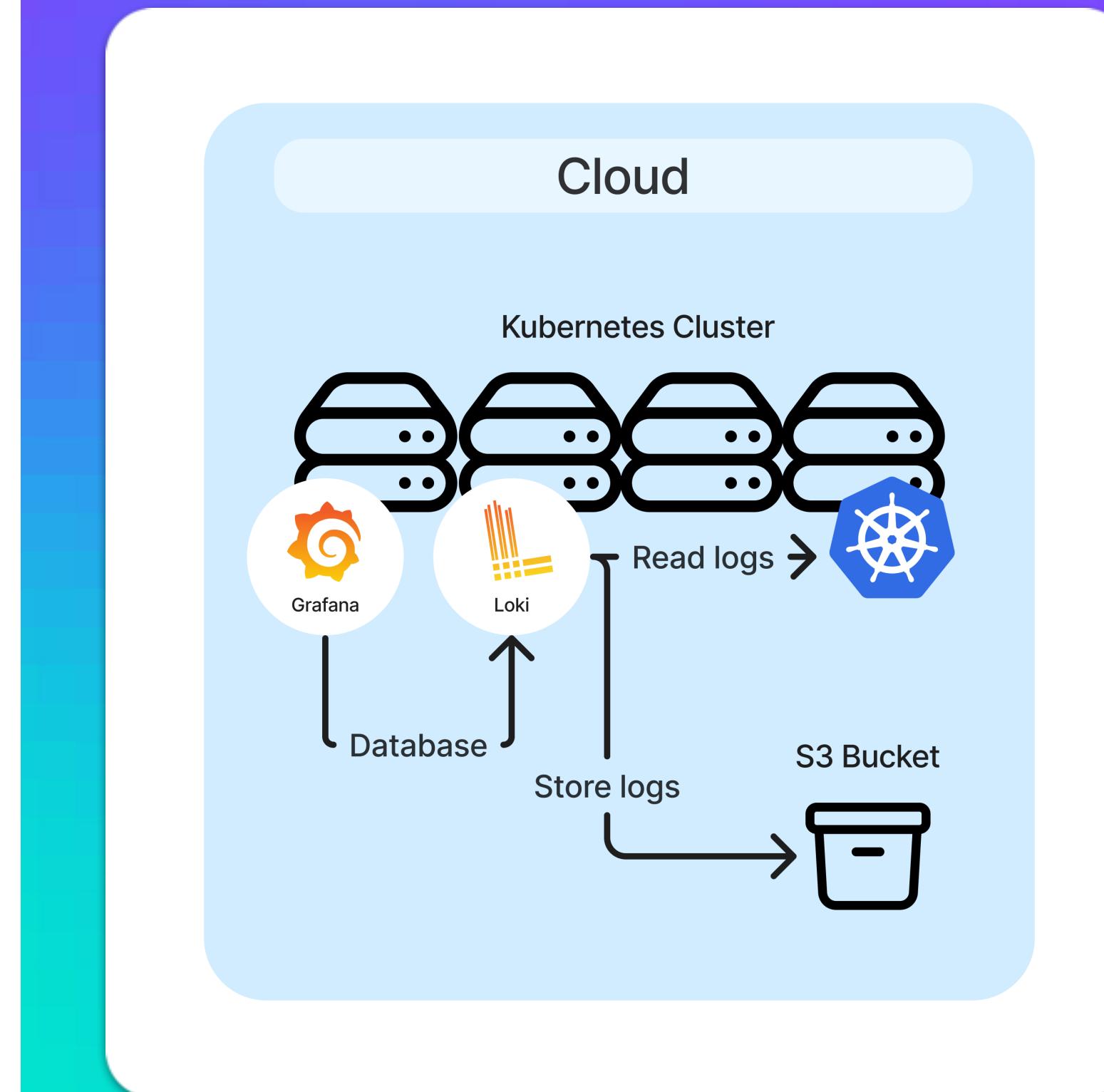
Restrictable

Grafana & Loki

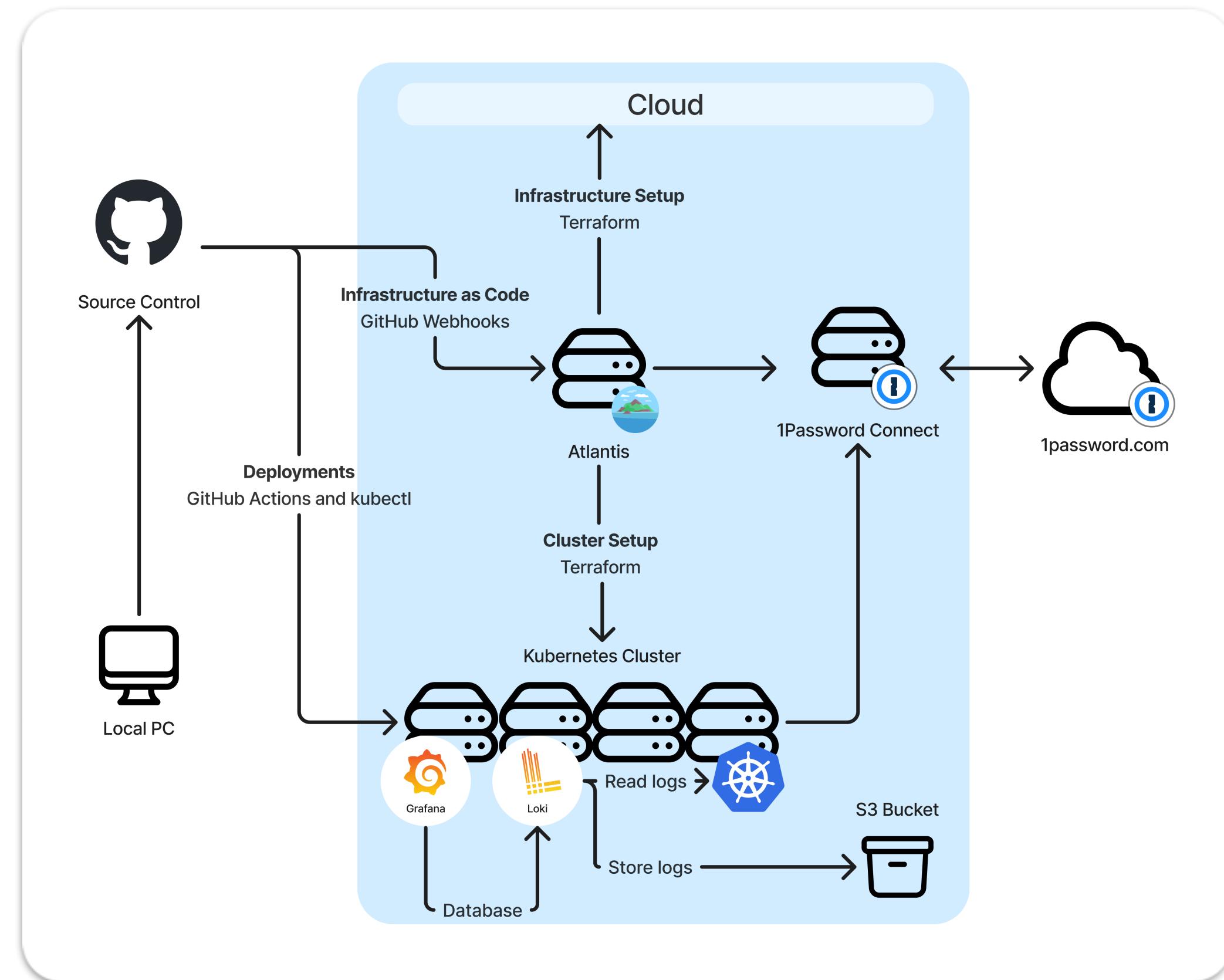
Grafana & Loki

Grafana is the open source **analytics & monitoring solution** for every database.

Loki is a **horizontally scalable, highly available, multi-tenant log aggregation system** inspired by Prometheus. It is designed to be very **cost effective and easy to operate**.



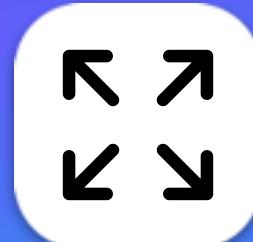
Grafana & Loki



Grafana & Loki



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Questions?

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