

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:

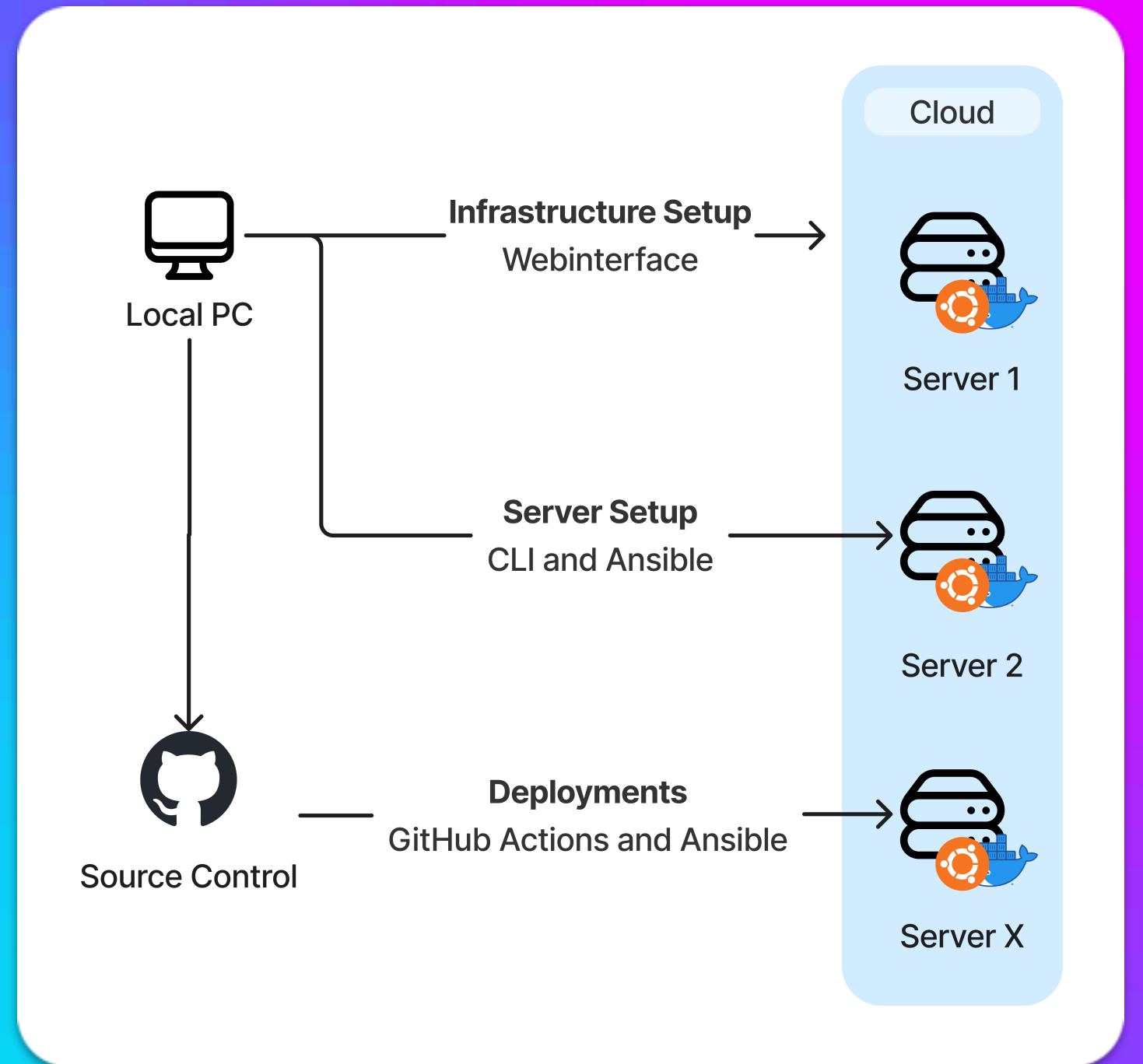
- Manually using web interface

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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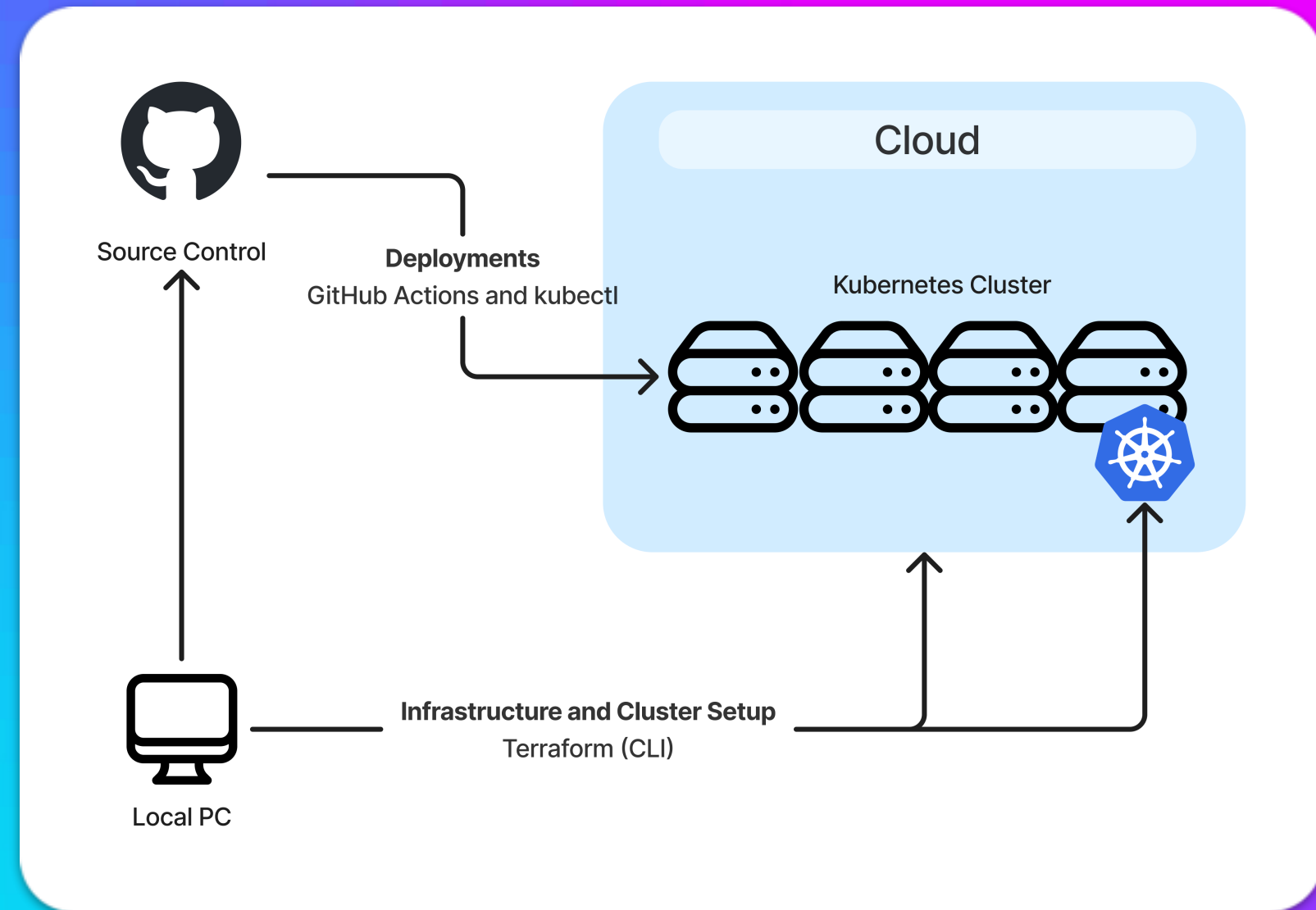
Kubernetes

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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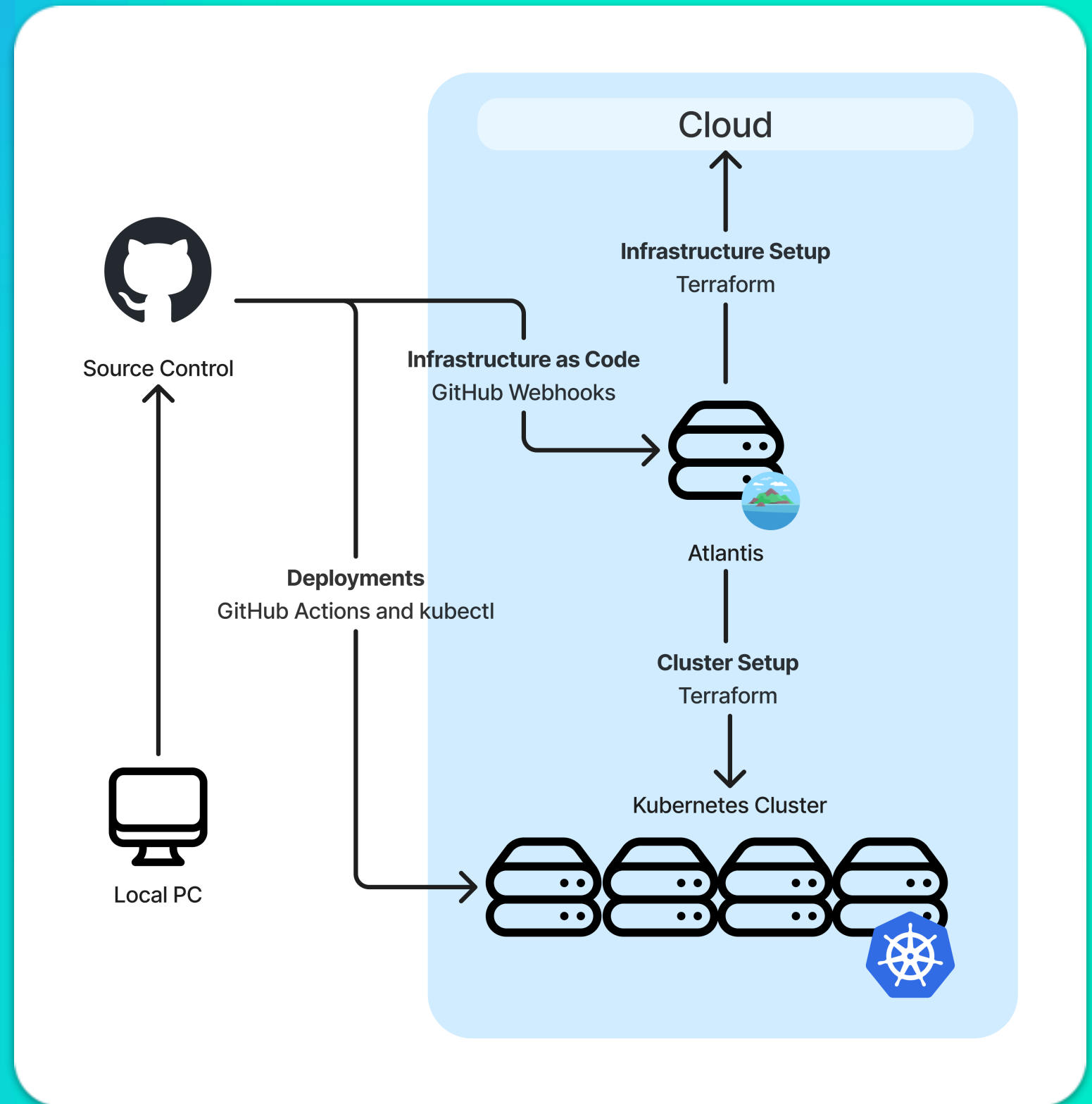
Restrictable

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



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

The screenshot shows a GitHub pull request interface. At the top, the repository is identified as 'aboutbits / infrastructure'. The pull request title is 'Add example.techtalkssouthtyrol.it domain #73'. The author is 'alexlanz', who wants to merge 1 commit into the 'main' branch from the 'example' branch. The pull request is currently open and has 1 commit, 0 checks, and 1 file changed. A comment from 'alexlanz' states 'No description provided.' Below the comment, a commit is shown: 'add example.techtalkssouthtyrol.it domain' with a 'Verified' status and commit hash 'bf6b7eb'. The right sidebar contains sections for 'Reviewers' (no reviews), 'Assignees' (no one assigned), 'Labels' (none yet), 'Projects' (none yet), 'Milestone' (none), 'Notifications' (unsubscribe button), and '1 participant'. The bottom section of the pull request contains several status messages: 'Code owner review required' (waiting on review from aboutbits/management), '1 pending reviewer', 'Some checks haven't completed yet' (2 pending checks), two pending Atlantis checks ('atlantis/plan' and 'atlantis/plan: infrastructure-digitalocean'), and 'Merging is blocked' (requires 1 approving review).

The screenshot shows a GitHub pull request interface. At the top, there are navigation tabs: Conversation (0), Commits (1), Checks (0), and Files changed (1). On the right, a progress bar shows +8 -0. The main content area features a comment from alexlanz stating "No description provided." Below this is a commit titled "add example.techtalkssouthtyrol.it domain" with a "Verified" badge and commit hash bf6b7eb. A subsequent comment from alexlanz indicates a review request from aboutbits/management as a code owner. A large comment from aboutbits-tech provides Terraform plan details, including the project name "infrastructure-digitalocean" and workspace "default". It lists instructions for applying plans ("atlantis apply") and deleting them ("atlantis unlock"). At the bottom, a red error banner states "Code owner review required" and "Waiting on code owner review from aboutbits/management." The right sidebar contains sections for Reviewers (management), Assignees, Labels, Projects, Milestone, and Notifications (Unsubscribe).

.github/CODEOWNERS
* @aboutbits/management

Open Add `example.techtalkssouthtyrol.it` domain #73
alexlanz wants to merge 1 commit into `main` from `example`

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:

```
# digitalocean_record.it_techtalkssouthtyrol_example_CNAME will be created
+ 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](#)

You're receiving notifications because you authored the thread.

1 participant

Atlantis

Merged Add `example.techtalkssouthtyrol.it` domain #73
aboutbits-tech merged 1 commit into `main` from `example` now

mmalfertheiner approved these changes on behalf of `aboutbits/management` 12 hours ago [View reviewed changes](#)

alexlanz commented now Author

atlantis apply

1

aboutbits-tech commented now

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

```
digitalocean_record.it_techtalkssouthtyrol_example_CNAME: Creating...  
digitalocean_record.it_techtalkssouthtyrol_example_CNAME: Creation complete after 1s [20-176  
Apply complete! Resources: 1 added, 0 changed, 0 destroyed.
```

aboutbits-tech commented now

Automatically merging because all plans have been successfully applied.

aboutbits-tech merged commit `f9a3022` into `main` now View details Revert
4 checks passed

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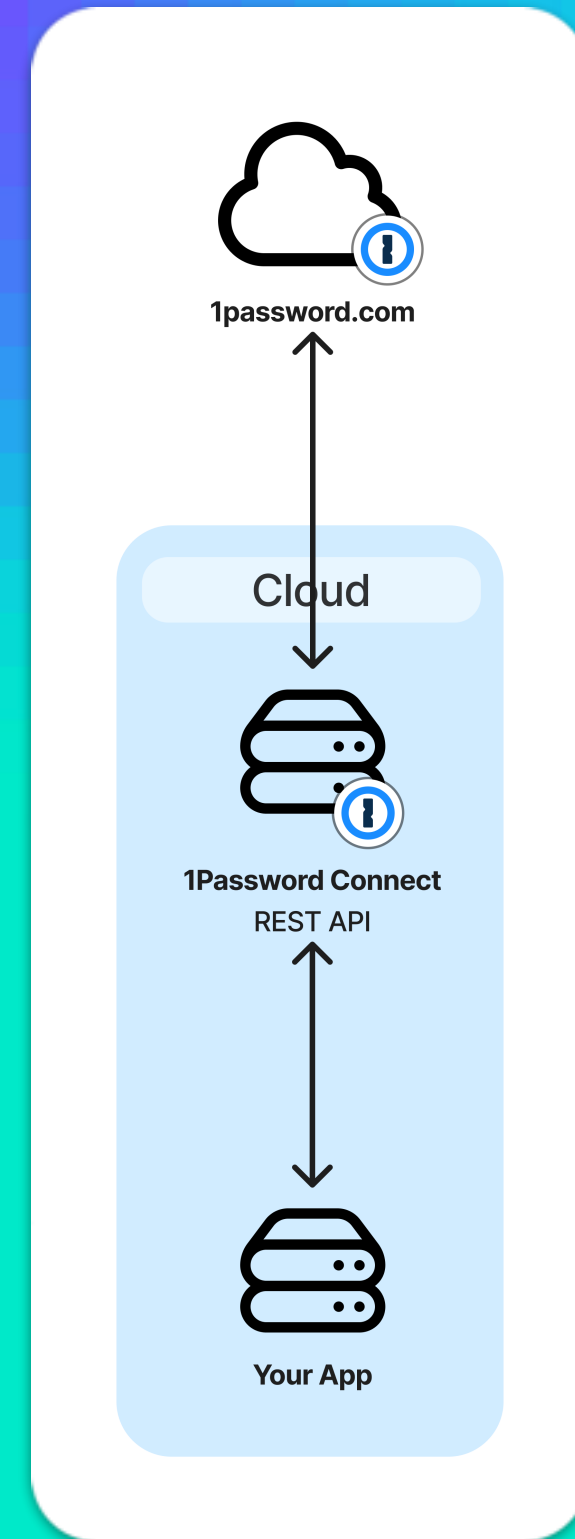


Restrictable

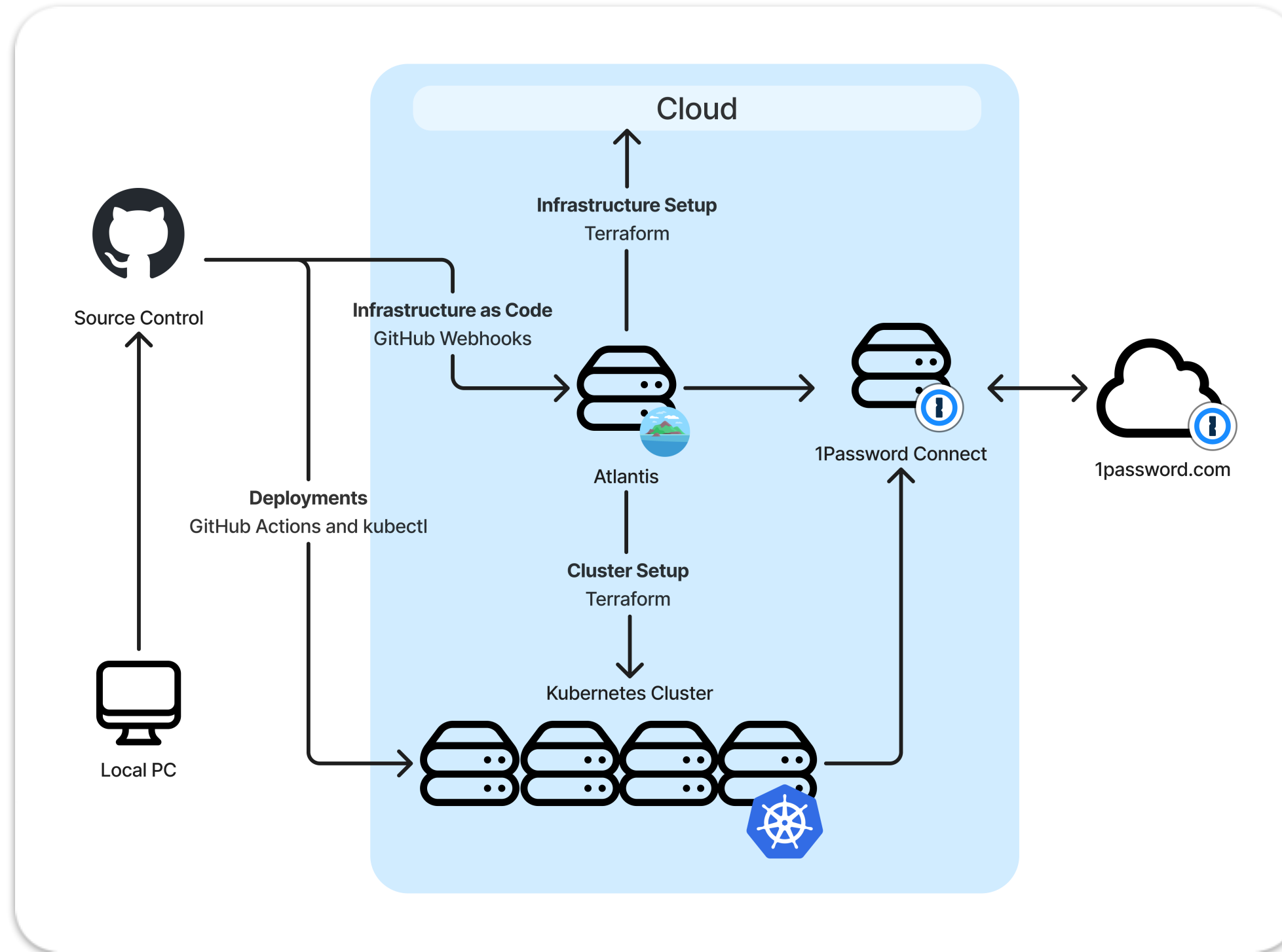
1 Password Connect

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
...
```

1 Password



Automated



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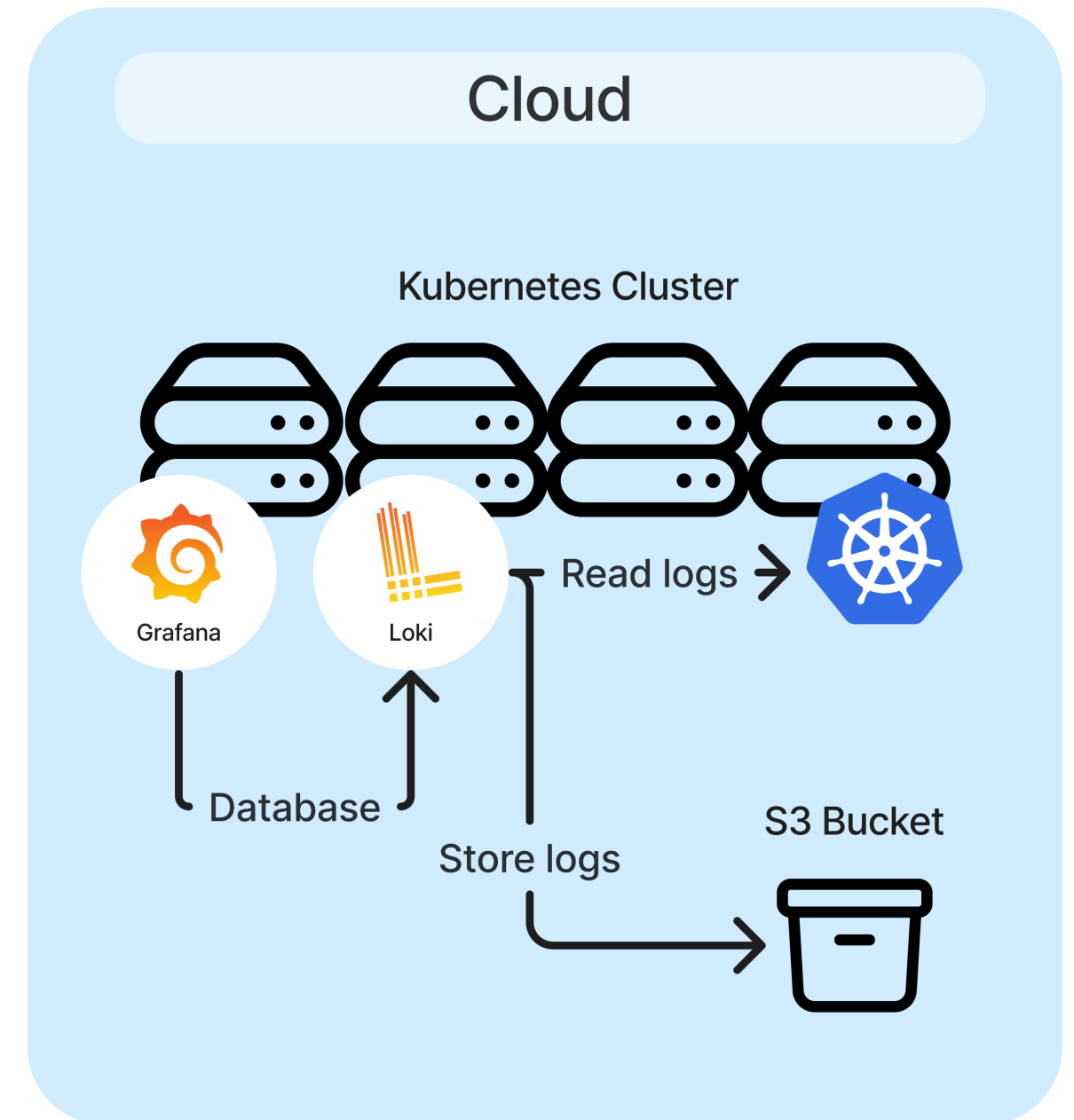
Restrictable

Grafana & Loki

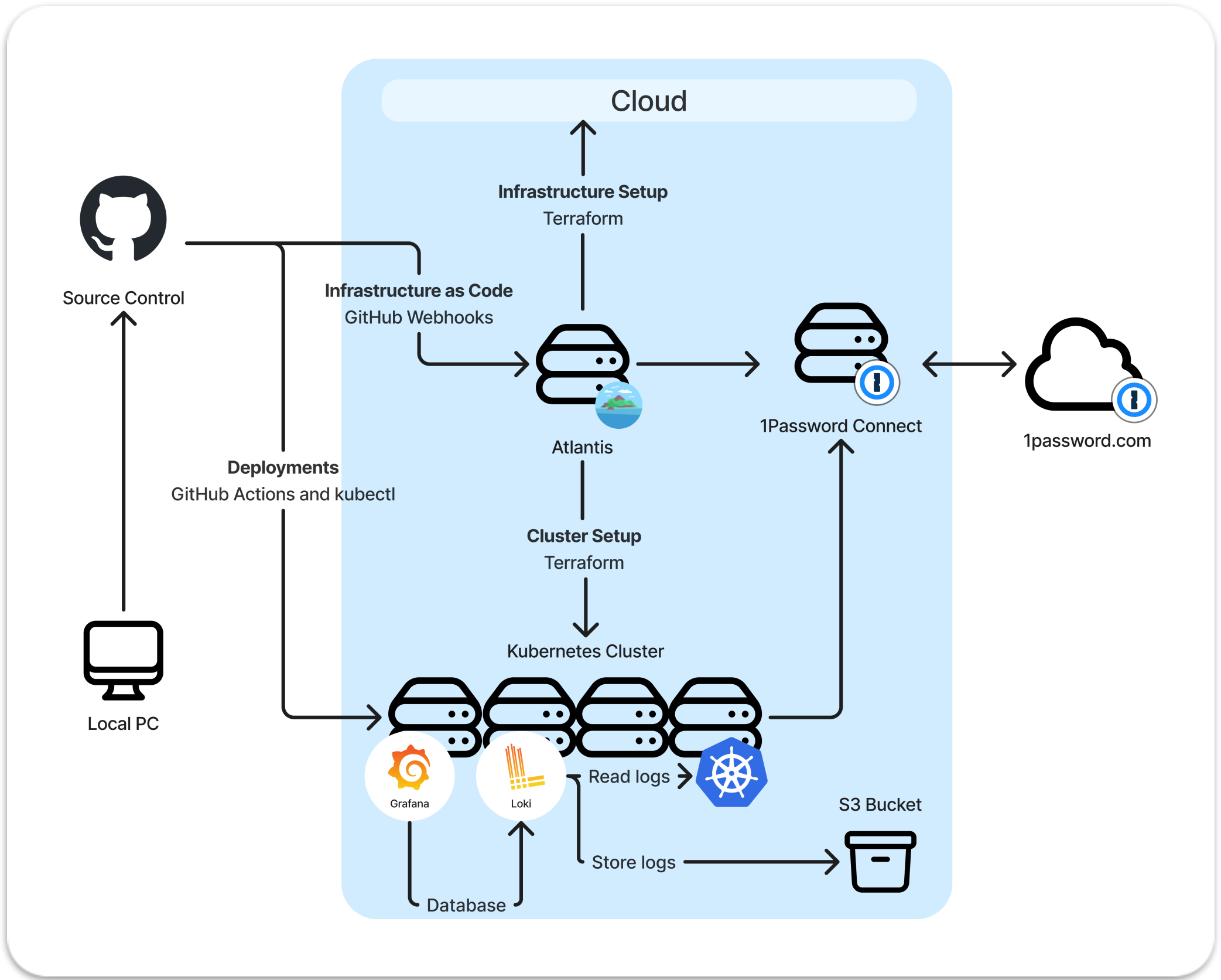
Grafana & Loki

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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