A hands-off approach for your Terraform

Jeff Knurek

Continuous Delivery starts with Continuous Infrastructure

Kris Buytaert

UB4.136
2020-02-02

https://www.youtube.com/watch?v=LnyBo6m4ods
https://archive.fosdem.org/2020/schedule/event/continuous_delivery_starts_with_continuous_infrastructure


AppVeyor
argo
Bamboo
BRIGADE
Buildkite
circleci
Skycap
cloudbees
codefresh
CODESHIP
Concourse
ContainerOps
DeployHub
Drone
GITKUBE
GitLab
go
Google Cloud Build
Habitus
Jenkins
JenkinsX
Octopus Deploy
Semaphore
shippable
Spinnaker
TeamCity
Travis CI
HYSCALE
wavemaker
weave
flux
wercker
DEPLOY
ZUUL

In case of fire 

1. git commit
2. git push
3. leave building

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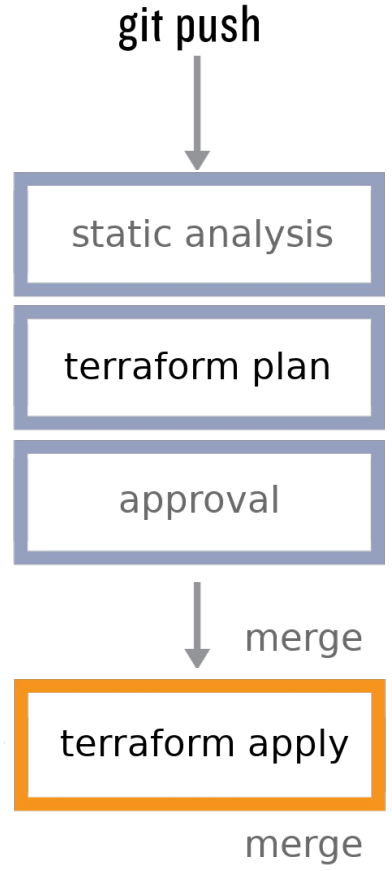

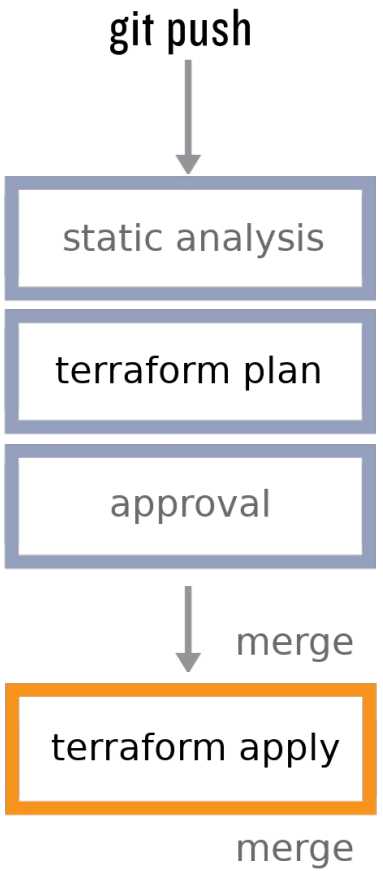
git push
static analysis
terraform plan
approval
merge
terraform apply
merge

Use what works


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DEPLOY
ZUUL

terraform apply --target

State management

Variable management

Lock file

Static analysis

TFSEC

checkov
by bridgecrew

Terrascan

https://blog.christophetd.fr/shifting-cloud-security-left-scanning-infrastructure-as-code-for-security-issues

Static analysis

```
$ terraform validate

$ terraform fmt
```

TFLint

https://github.com/terraform-linters/tflint

IDE

https://github.com/hashicorp/vscode-terraform

```
"[terraform]": {
    "editor.formatOnSave": true
}
"terraform-ls.experimentalFeatures": {
    "validateOnSave": true
}
```

Terraform Cloud

HashiCorp

Terraform Cloud

Atlantis

https://github.com/runatlantis/atlantis

Atlantis

```
  # module.apps.kubernetes_deployment.deployment is tainted, so must be replaced
-/+ resource "kubernetes_deployment" "deployment" {
      ~ id              = "some-app" -> (known after apply)
        wait_for_rollout = true

            ~ spec {
                - active_deadline_seconds          = 0 -> null
                - automount_service_account_token  = false -> null
                  dns_policy                       = "ClusterFirst"
                  host_ipc                         = false
                  host_network                     = false
                  host_pid                         = false
                + hostname                         = (known after apply)
                + node_name                        = (known after apply)
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tfarbe

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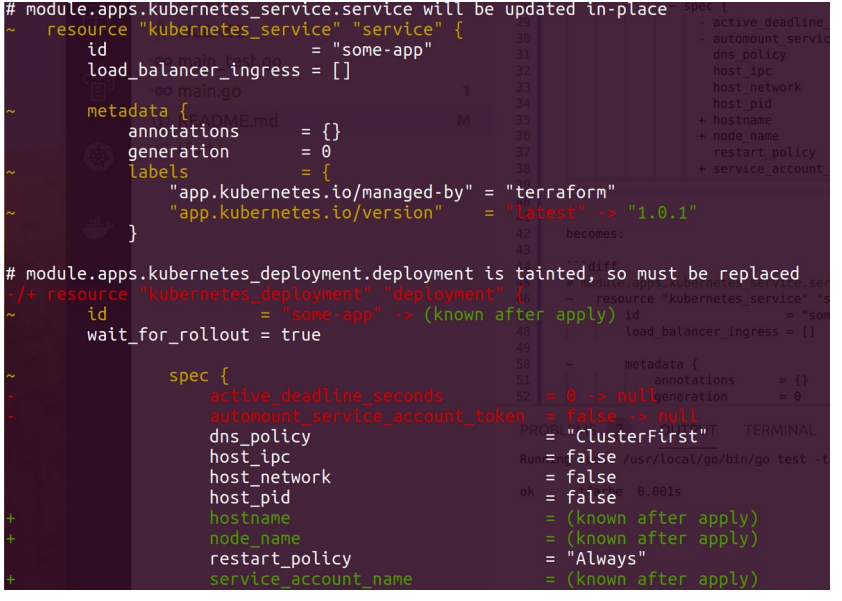
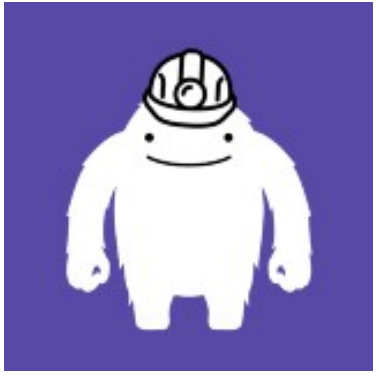


https://github.com/jeff-knurek/tfarbe

terragrunt



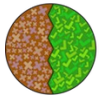
https://github.com/gruntwork-io/terragrunt

Tests

end-2-end

Terratest

https://github.com/gruntwork-io/terratest



Kitchen-Terraform

https://github.com/newcontext-oss/kitchen-terraform

unit

Conftest

https://github.com/open-policy-agent/conftest

terraform-compliance

https://github.com/terraform-compliance/cli

Mock Infrastructure

https://github.com/localstack/localstack

Versions

tfenv

https://github.com/tfutils/tfenv

https://wiki.nikitavoloboev.xyz/devops/terraform

Example/Demos

Github action

```
name: "Terraform"
...

     - name: Setup Terraform
       uses: hashicorp/setup-terraform@v1
       with:
         cli_config_credentials_token: ${{ secrets.TF_API_TOKEN }}
      - name: Terraform Format
       id: fmt
       run: terraform fmt -check
      - name: Terraform Init
       id: init
       run: terraform init
      - name: Terraform Plan
       id: plan
       if: github.event_name == 'pull_request'
       run: terraform plan -no-color
       continue-on-error: true
      - name: Terraform Plan Status
```

https://learn.hashicorp.com/tutorials/terraform/github-actions

CircleCI

```
version: '2.1'
orbs:
  terraform: 'circleci/terraform@dev:alpha'
workflows:
  deploy_infrastructure:
    jobs:
      - terraform/fmt:
          checkout: true
          context: terraform
      - terraform/validate:
          checkout: true
          context: terraform
          requires:
            - terraform/fmt
      - terraform/plan:
          checkout: true
          context: terraform
          persist-workspace: true
          requires:
            - terraform/validate
      - terraform/apply:
```

https://circleci.com/developer/orbs/orb/circleci/terraform

Jenkins

```
stages {
    stage('Init') {
        steps {
            sh 'terraform init'
        }
    }
    stage('Validate') {
        steps {
            sh 'terraform fmt'
            sh 'terraform validate'
        }
    }
    stage('Plan') {
        steps {
            sh 'terraform plan'
        }
    }
    stage('Apply') {
        steps {
            sh 'terraform apply -input=false -auto-approve'
        }
        when {
            expression { env.BRANCH_NAME == "master"}
```

https://wbassler23.medium.com/securing-secrets-for-your-iac-using-jenkins-terraform-and-ansible-vault-7009e0a7eb32

Visibility

Jeff Knurek

clevertech

@knurekit

jeff-knurek

photos found on Unsplash