Using Terraform Safely

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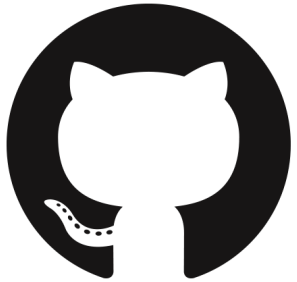

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Github

Infrastructure as Code (IaC)

Declaring and creating infrastructure resources through code

- AWS Cloudformation
- Azure ARM Templates
- Pulumi
- HashiCorp Terraform

HashiCorp Terraform

- Written in Golang
- Resource declaration in HCL
- Terraform providers for resource interation

```
resource "aws_instance" "web" {
  ami           = "${data.aws_ami.ubuntu.id}"
  instance_type = "t2.micro"

  tags = {
    Name = "HelloWorld"
  }
}
```

Terraform Modules

A container for multiple resources used together.

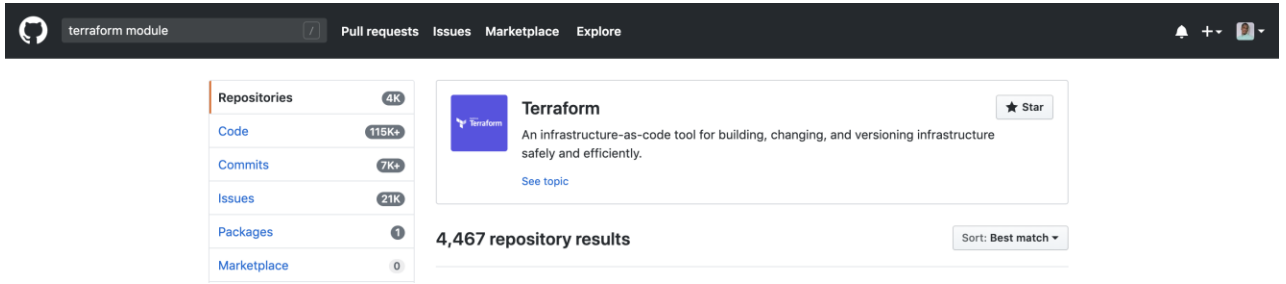
- Corporate EC2 Instance
- Application Stack
- AWS Network Stack

Public Terraform Modules

Terraform Registry: 109 Terraform Modules

https://registry.terraform.io/

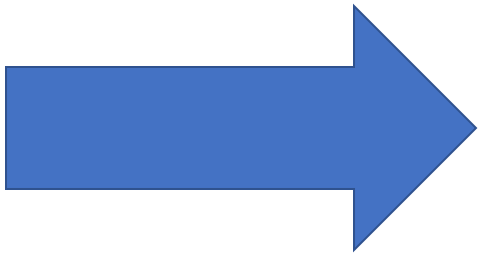
GitHub: 4,467 Terraform Modules



https://github.com/search?q=terraform+module

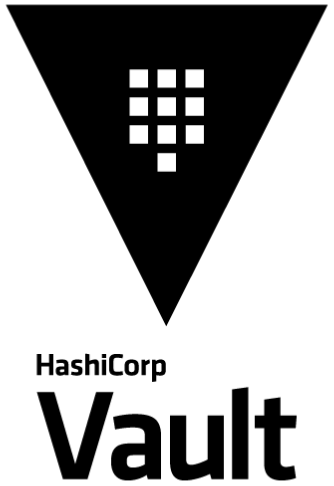
Public Terraform Modules

Speed (Agility)



Security

Public Terraform Modules

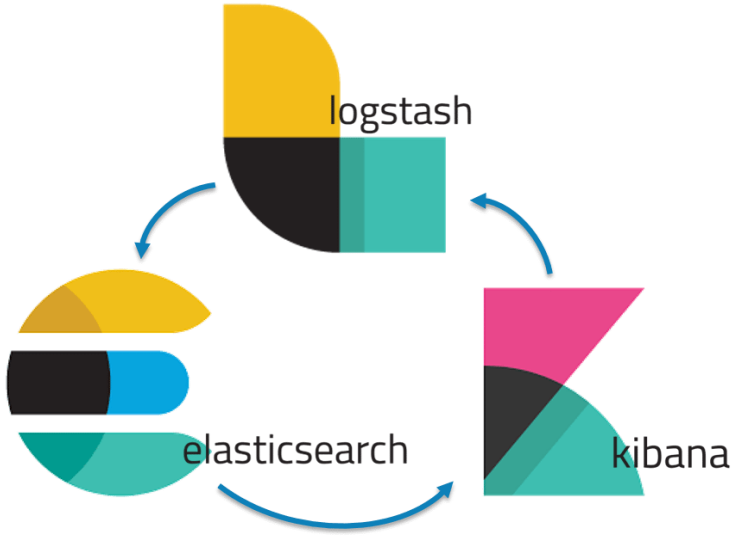



```
# !! WARNING !! These example AMIs are meant only convenience when initially testing this repo. Do NOT use these example
# AMIs in a production setting as those TLS certificate files are publicly available from the Module repo containing
# this code.


# To make testing easier, we allow requests from any IP address here but in a production deployment, we *strongly*
# recommend you limit this to the IP address ranges of known, trusted servers inside your VPC.

allowed_ssh_cidr_blocks             = ["0.0.0.0/0"]
allowed_inbound_cidr_blocks         = ["0.0.0.0/0"]
```

Public Terraform Modules



Public Terraform Modules

- Develop a formal module review process
- Understand the technology
- Update the module version accordingly

Terraform Secrets

```
resource "tls_private_key" "example" {
  algorithm = "ECDSA"
}

resource "tls_self_signed_cert" "example" {
  key_algorithm   = "${tls_private_key.example.algorithm}"
  private_key_pem = "${tls_private_key.example.private_key_pem}"
  validity_period_hours = 12
  allowed_uses = [
      "key_encipherment",
      "digital_signature",
      "server_auth",
  ]
  subject {
      common_name  = "example.com"
  }
}
```

https://www.terraform.io/docs/state/sensitive-data.html

Terraform Secrets

tls_private_key resource

Important Security Notice The private key generated by this resource will be stored *unencrypted* in your Terraform state file. **Use of this resource for production deployments is *not* recommended**. Instead, generate a private key file outside of Terraform and distribute it securely to the system where Terraform will be run.

https://www.terraform.io/docs/providers/tls/r/private_key.html

Terraform Secrets

Terraform Show Output

```
# tls_private_key.example:
resource "tls_private_key" "example" {
    algorithm       = "ECDSA"
    ecdsa_curve     = "P224"
    id              = "97bbb6dc1cfe44f5cf33976a2b94fba8671c422f"
    private_key_pem = "-----BEGIN EC PRIVATE KEY-----\nMGgCAQEEHIFodc48ovOxgeTFOhw039UcMC5glOZyI8NIcq2gBwYFK4EEACGhPAM6\nAAQ044dMB
tBC7BG4oeRiKYEBg+2PoyOqE1LNNXcAeURuKhQZGj9AL/jxAgKRMAn/\nJstJekojzTRQ7Q==\n-----END EC PRIVATE KEY-----\n"
    public_key_pem  = "-----BEGIN PUBLIC KEY-----\nME4wEAYHKoZIzj0CAQYFK4EEACEDOgAENOOHTAbQQuwRuKHkYimBAYPtj6MjqhNS\nzTV3AHlEbioUG
Ro/QC/48QICkTAJ/ybLSXpKI800UO0=\n-----END PUBLIC KEY-----\n"
    rsa_bits        = 2048
}
```

Terraform Secrets

Private key is visible in tfstate files #38

Open [redacted] opened this issue 21 days ago · 4 comments

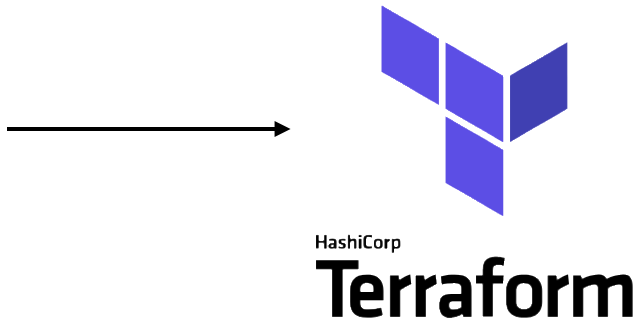
[redacted]

[redacted] commented 21 days ago

I can see private key in tfstate file..... isn't it a security breach..?

Terraform Secrets

State Storage Encryption



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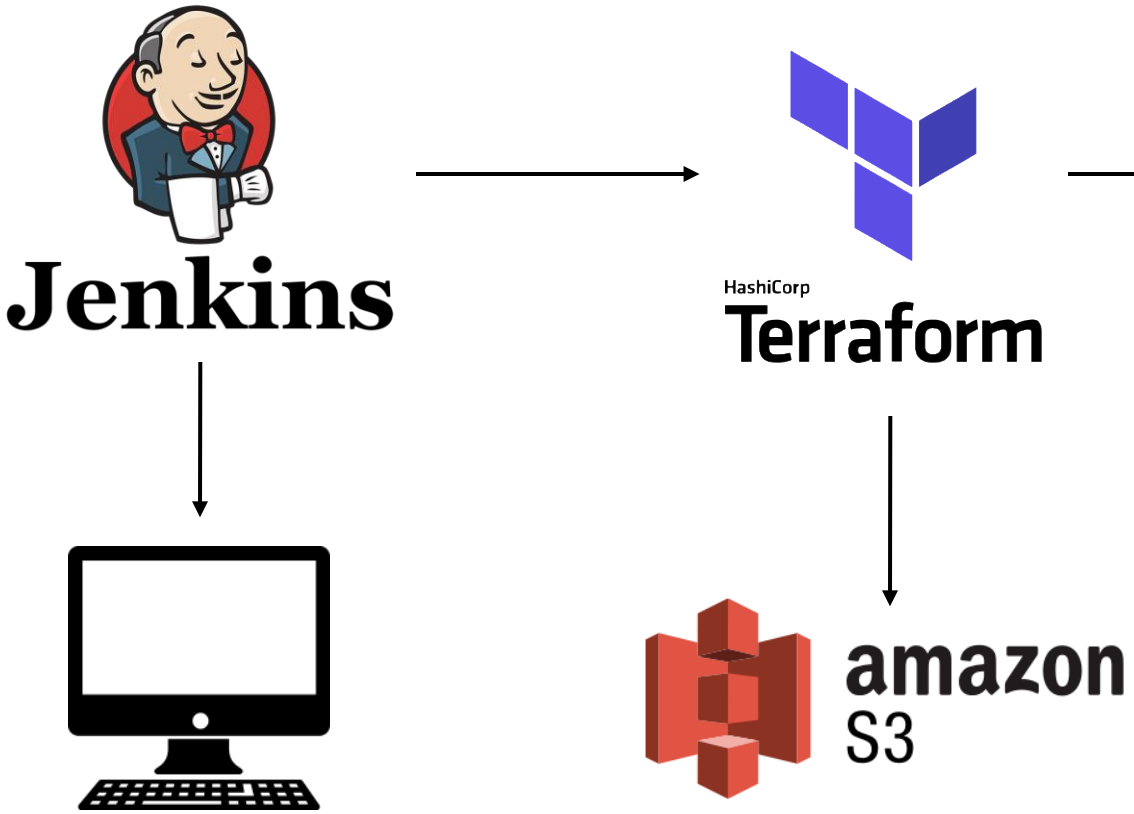
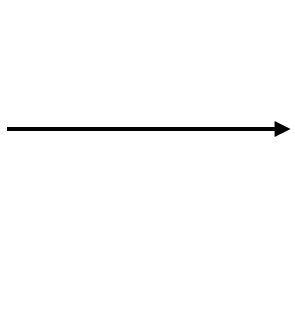
Terraform Secrets

Jenkins Console Output



Terraform Secrets

Jenkins Log File



Terraform Secrets

- Terrahelp: A tool written in GO that integrates with HashiCorp Vault to provide both file and inline encryption of Terraform state files.
- Terraformectomy: A shell script for redacting aws secrets from Terraform state files.
- Terraform IAM Redact Script: Another shell script for redacting AWS secrets from Terraform state files.

Terraform Secrets

There's no perfect solution but knowledge is power and knowing is half the battle

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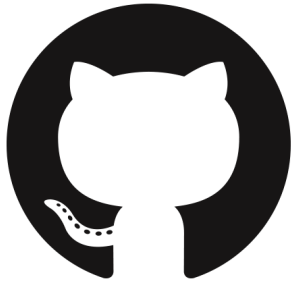

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