
PROLOGUE
Design and Develop a
Serverless Event-Driven
Microservice-Based Solution

Introduction to Infrastructure as Code and Terraform

Spells for Provisioning Cloud Resources

Conjuring Efficiency: DevOps and IaC

Terraform Magic: Spells for Provisioning Cloud Resources

DevOps

Set of practices, tools, and a cultural philosophy that **automates and integrates** the processes between software development and IT teams

Emphasizes **team empowerment**, **cross-team communication**, and **technology automation**.

DevOps Key Principles

Collaboration

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Automation

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Automation

Continuous Improvement

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Automation

Continuous Improvement

Customer-Centric Action

DevOps Key Principles

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Continuous Improvement

Customer-Centric Action

Create with End in Mind

DevOps Key Principles

- Collaboration
- Automation
- Continuous Improvement
- Customer-Centric Action
- Create with End in Mind

DevOps Impact on Software Quality

Automated Testing

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Faster Feedback

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Collaboration

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Infrastructure as Code (IaC)

DevOps Impact on Software Quality

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Continuous Monitoring

DevOps Impact on Software Quality

- Automated Testing
- Faster Feedback
- Collaboration
- Infrastructure as Code (IaC)
- Continuous Monitoring
- **Security Integration**

DevOps Impact on Software Quality

- Automated Testing
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- Infrastructure as Code (IaC)
- Continuous Monitoring
- Security Integration

Infrastructure as Code (IaC)

Practice of managing **infrastructure** – such as servers, networks, and storage – using **code**.

Infrastructure code is stored in repositories just like software allowing for better **collaboration** and **automation**.

IaC Usefulness

Consistency and Automation

IaC Usefulness

Consistency and Automation

Efficiency

IaC Usefulness

Consistency and Automation

Efficiency

Scalability

IaC Usefulness

Consistency and Automation

Efficiency

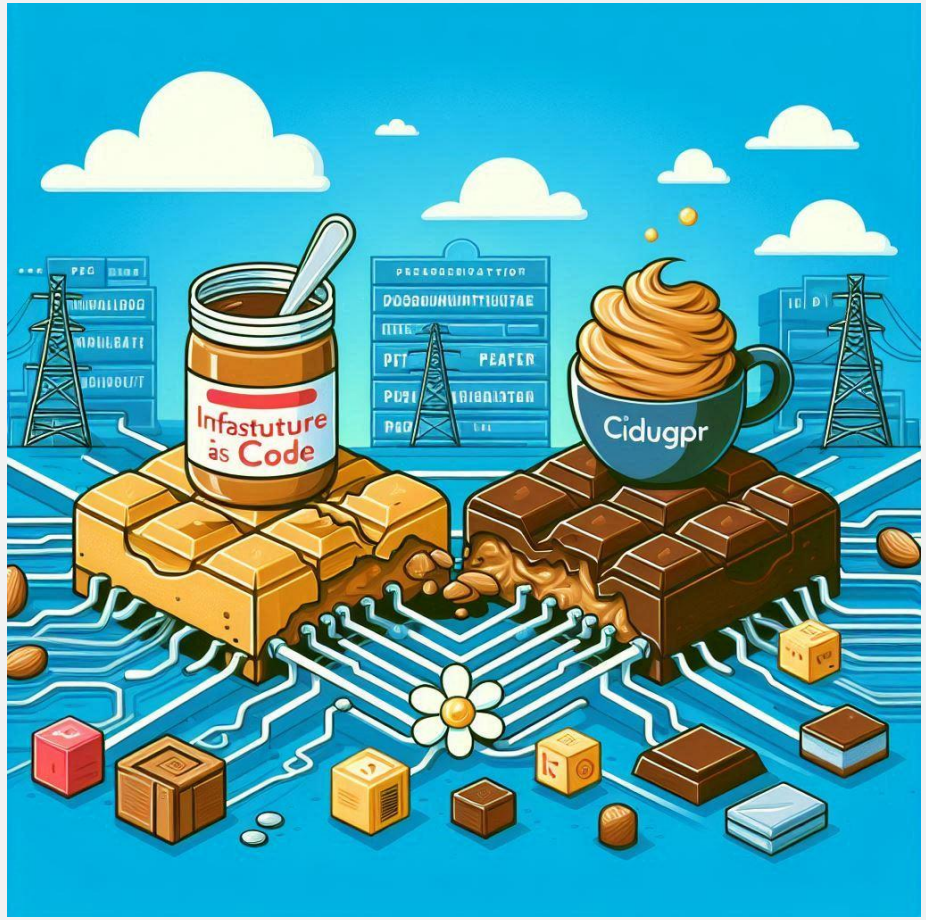
Scalability

Reduced Config Errors

IaC Usefulness

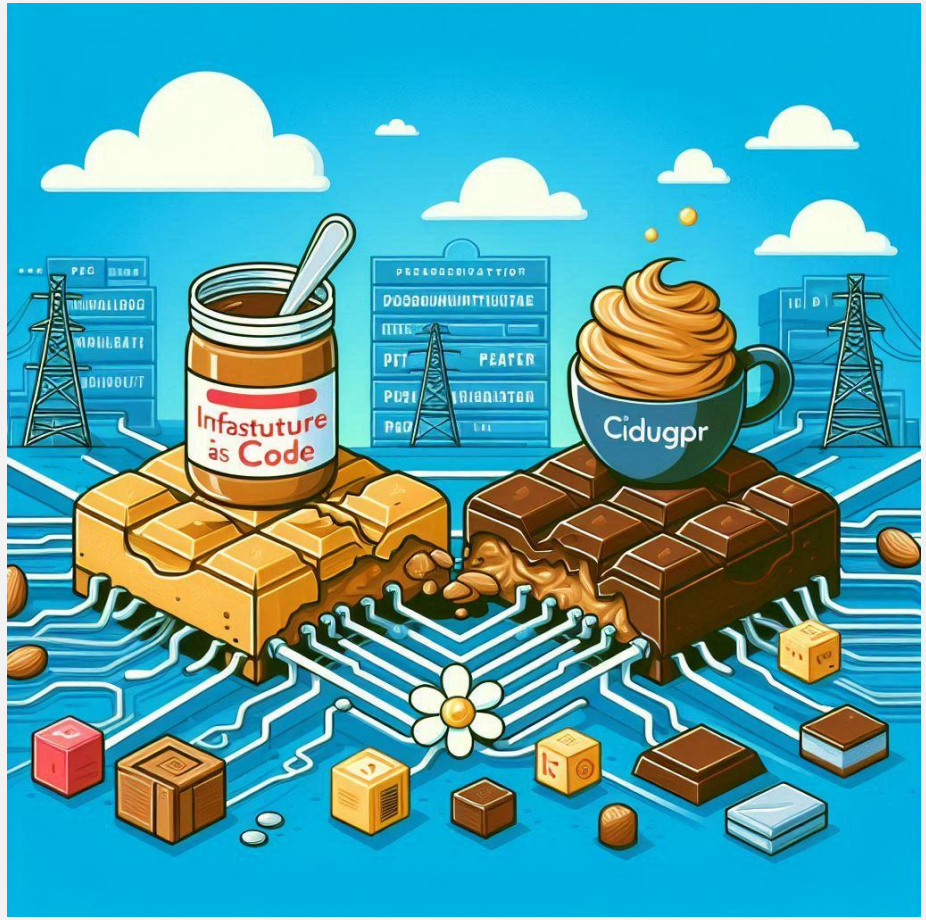
- Consistency and Automation
- Efficiency
- Scalability
- Reduced Config Errors

IaC and DevOps



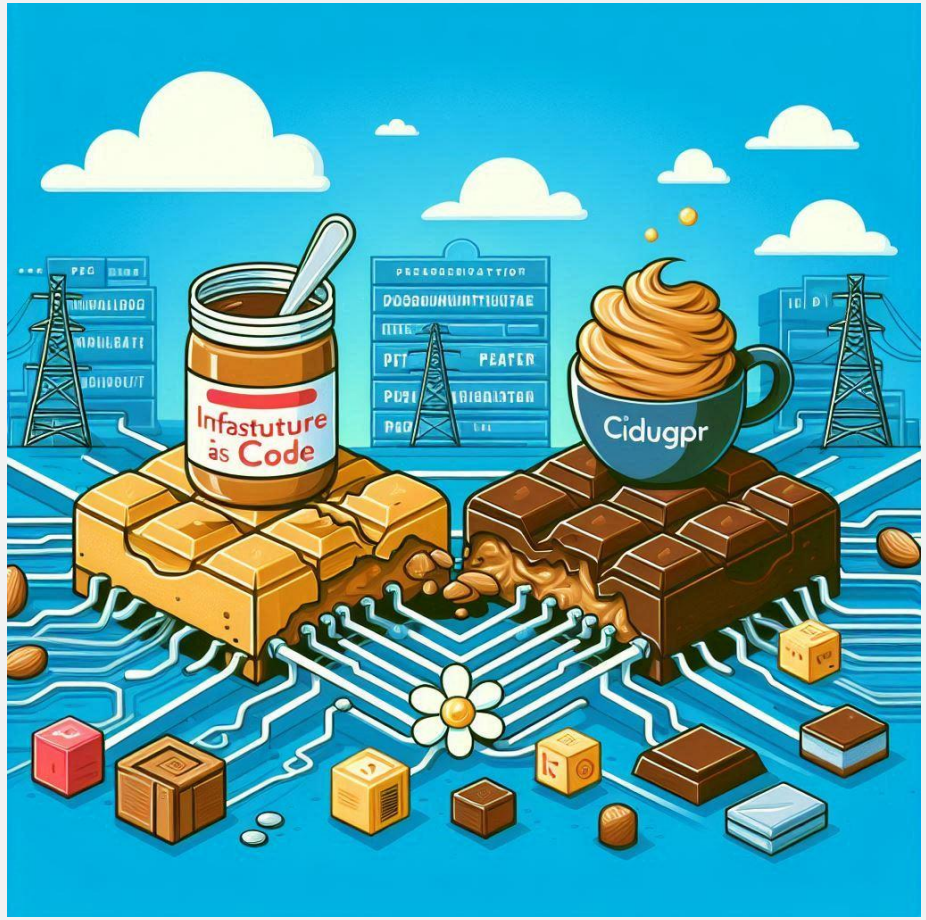
- Continuous Integration and Continuous Deployment (CI/CD)

IaC and DevOps



- Continuous Integration and Continuous Deployment (CI/CD)
- Version Control and Collaboration

IaC and DevOps



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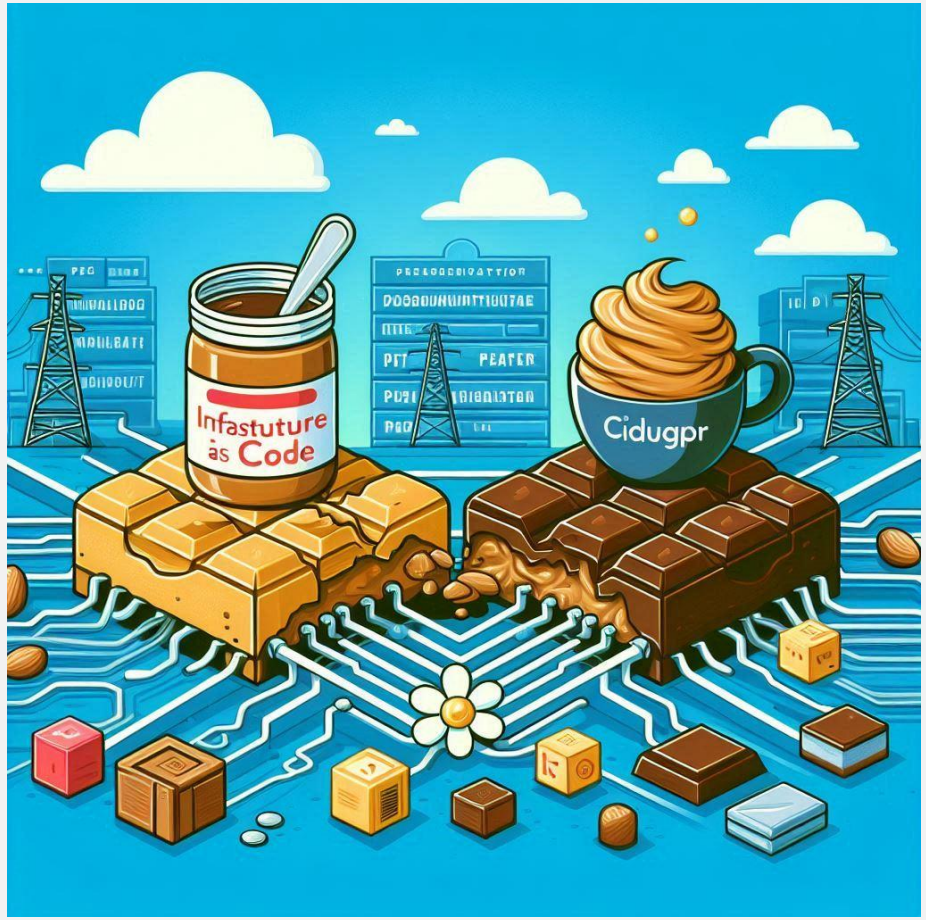
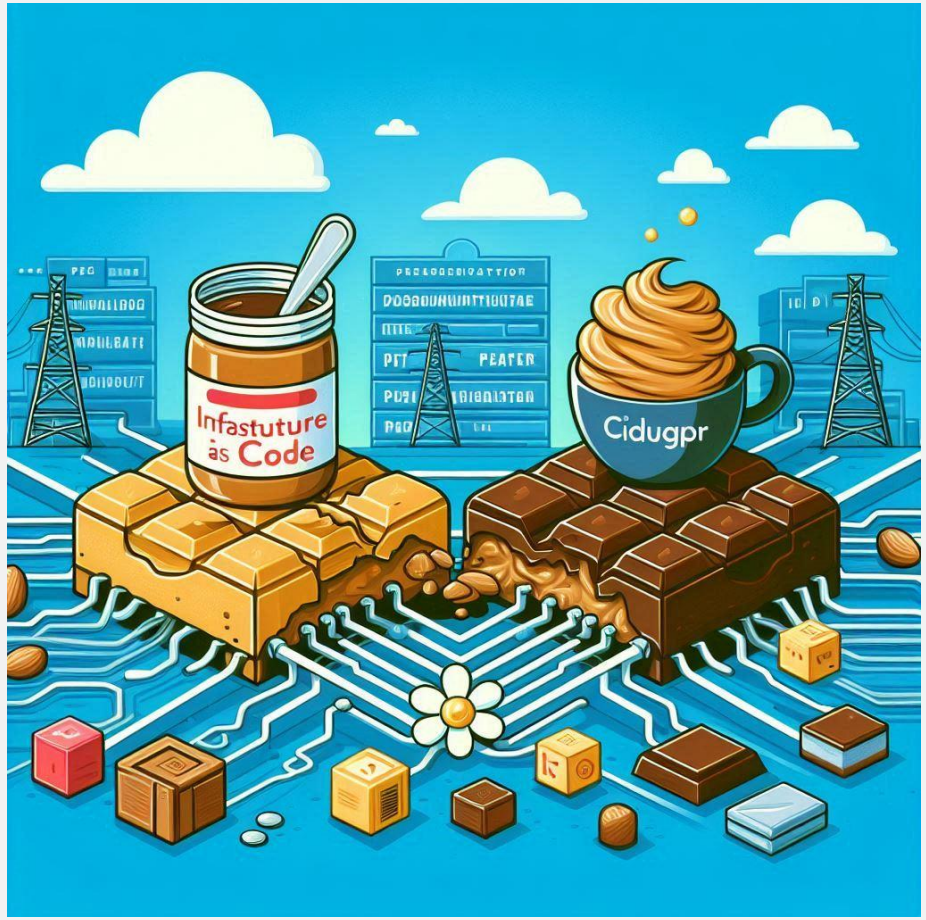
IaC and DevOps



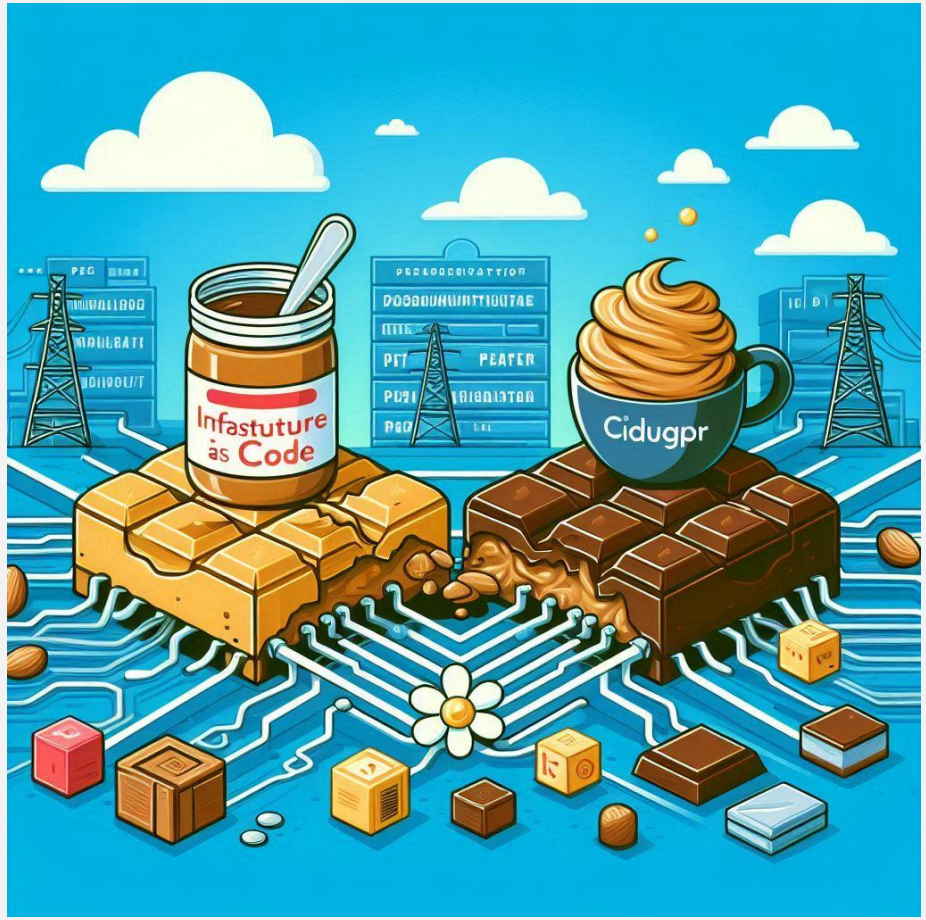
- Continuous Integration and Continuous Deployment (CI/CD)
- Version Control and Collaboration
- Automated Provisioning
- Immutable Infrastructure

IaC and DevOps



- Continuous Integration and Continuous Deployment (CI/CD)
- Version Control and Collaboration
- Automated Provisioning
- Immutable Infrastructure
- Testing and Validation

IaC and DevOps



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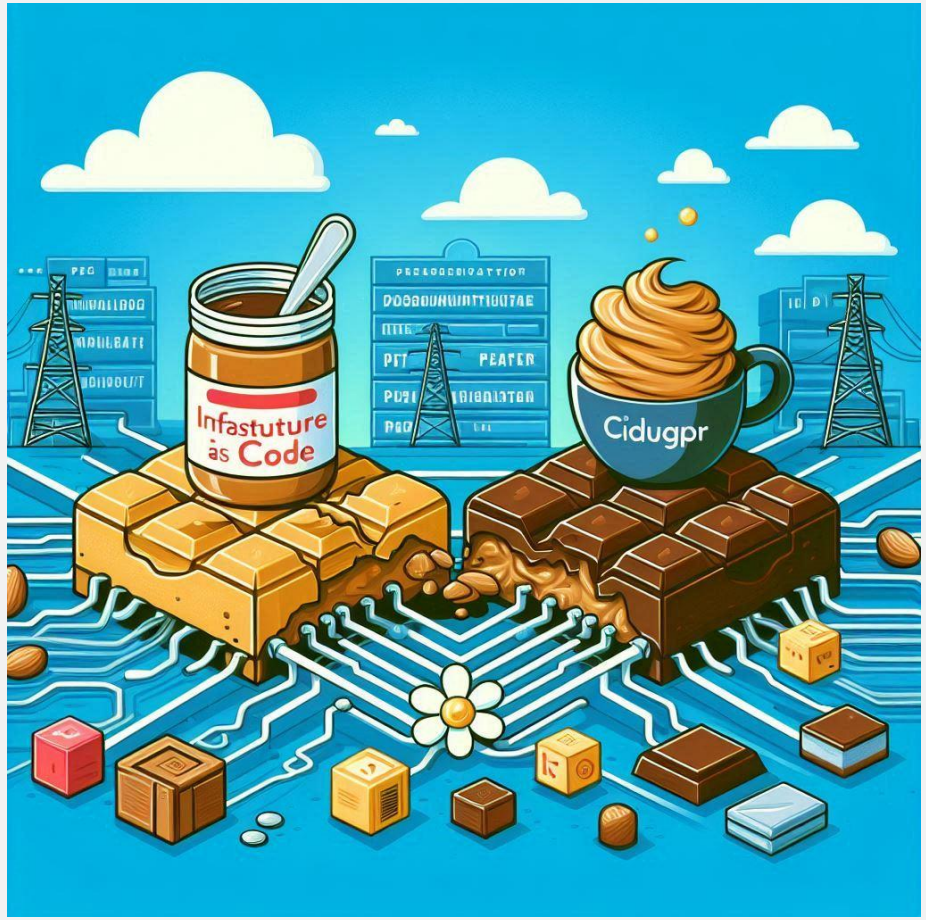
IaC and DevOps



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IaC Challenges

- Learning Curve
- Tool Proliferation
- Cloud Complexity
- Version Control
- Drift Management
- Security Concerns
- Enterprise Governance

Wizard of Provisioning: Terraform

Terraform Magic: Spells for Provisioning Cloud Resources

Terraform to the Rescue

Infrastructure as Code (IaC) tool that allows you to **build**, **modify**, and **version** cloud and on-premises resources efficiently.

With Terraform, you define infrastructure using **human-readable** configuration files, which can be **versioned**, **reused**, and **shared**.

How does Terraform work?

- Configuration Files
- Providers
- Workflow
- Immutable Infrastructure

Write

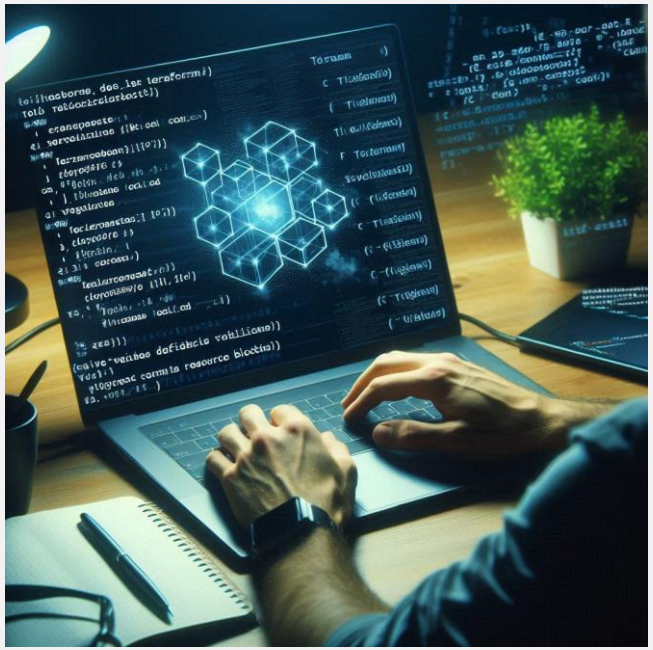
Plan

Apply

Terraform Project Structure

- .tf files
- .tfvars files
- terraform.tfstate
- .terraform directory

Terraform Elements

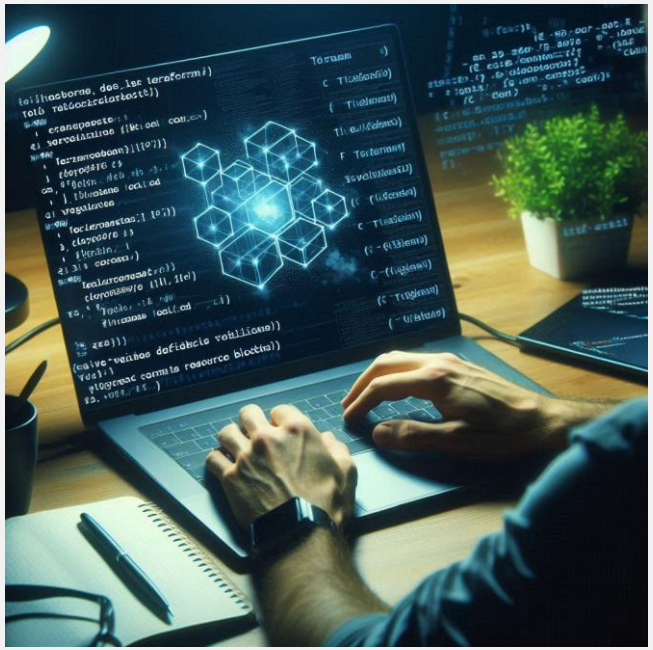


Resources

```
resource "azurerm_service_plan" "order_next_core" {
  name                = “asp-OrderNextCore-dev-usnc"
  resource_group_name = data.azurerm_resource_group.rg.name
  location            = data.azurerm_resource_group.rg.location
  os_type             = "Linux"
  sku_name            = "Y1"
  tags                = local.tags
}
```

Terraform Elements

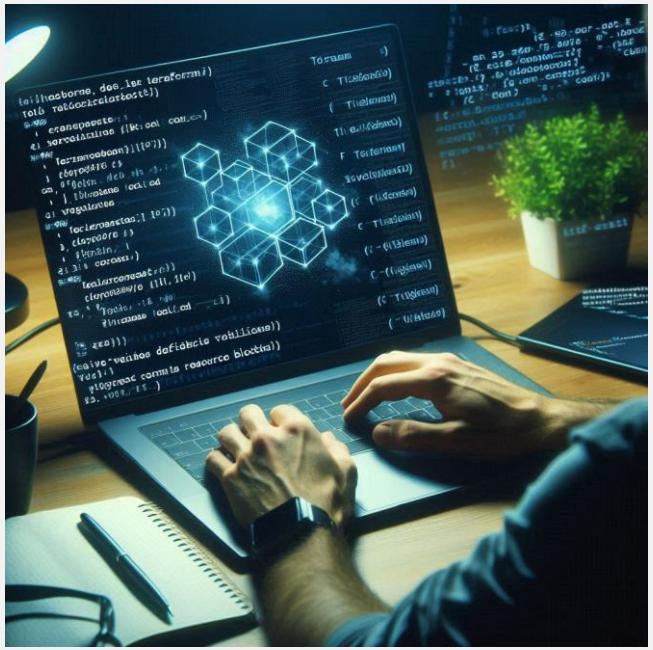
Data Sources



```
data "azurerm_resource_group" "rg" {
  name = var.resource_group_name
}
```

Terraform Elements

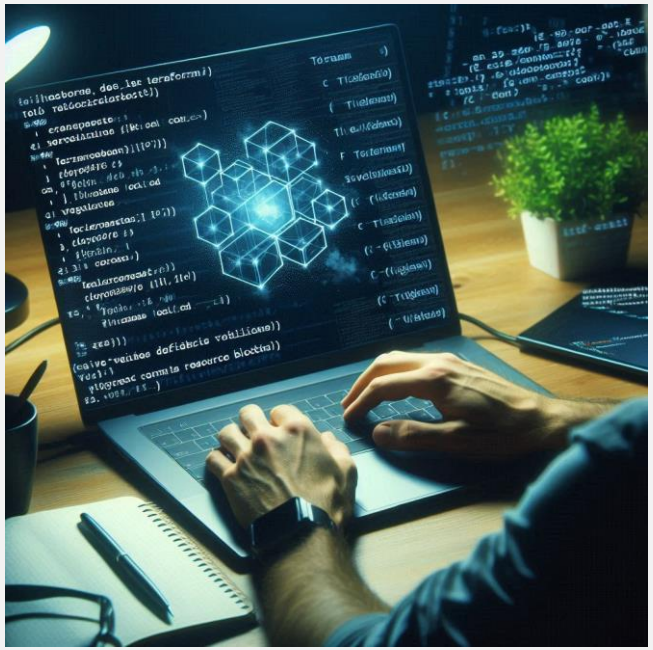
Variables



```
variable "tag_cost_center" {
  type        = string
  default     = "Remanufacturing"
  description = "Accounting cost center for the resource."
}
```

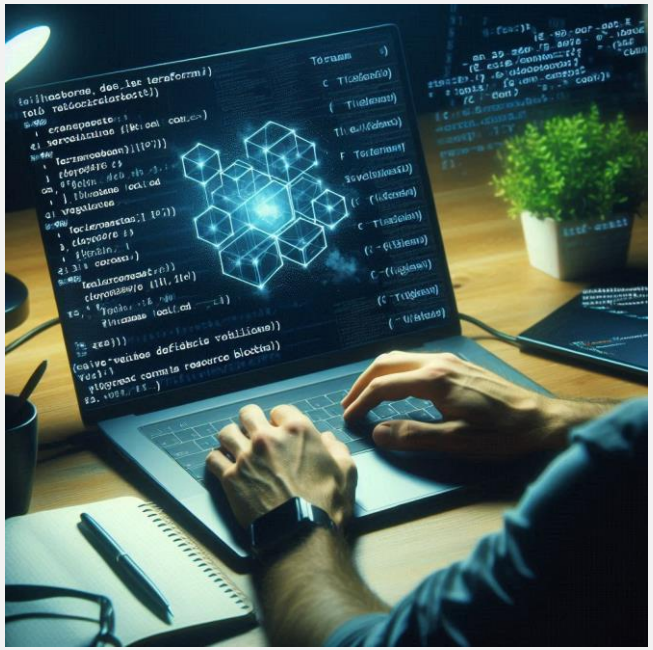
Terraform Elements

Modules



```
module "azure_regions" {
  source       = "git::https://github.com/TLC/azure-regions.git"
  azure_region = var.azure_region
}
```

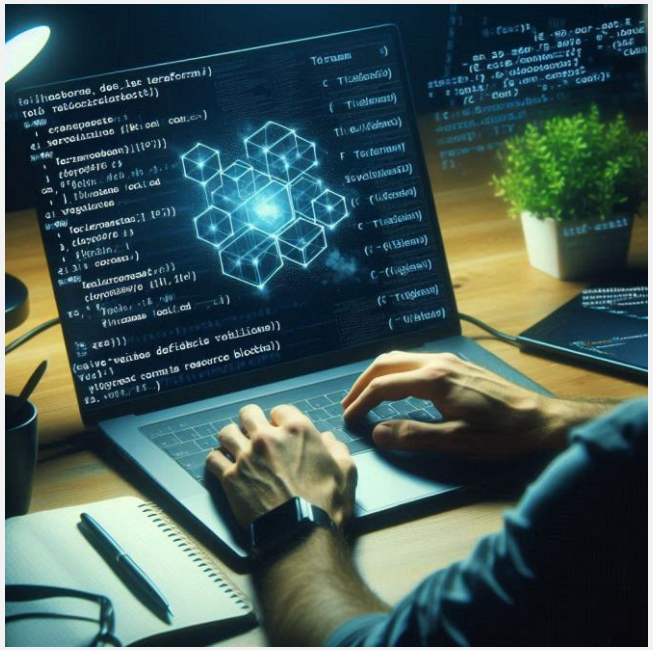
Terraform Elements



Locals

```
locals {
  tags = {
    Product      = var.tag_product
    Criticality = var.tag_criticality
    CostCenter   = var.tag_cost_center
    DR           = var.tag_disaster_recovery
    Env          = var.azure_environment
  }
}
```

Terraform Elements



Providers

```
provider "azurerm" {
  features {
    resource_group {
      prevent_deletion_if_contains_resources = true
    }
  }
}
```

Conclusion

- Infrastructure as Code and Terraform offers a modern approach to managing infrastructure, providing speed, consistency, and scalability.


EXPLORING SERVERLESS
DESIGN PATTERNS