



Specialized Topics

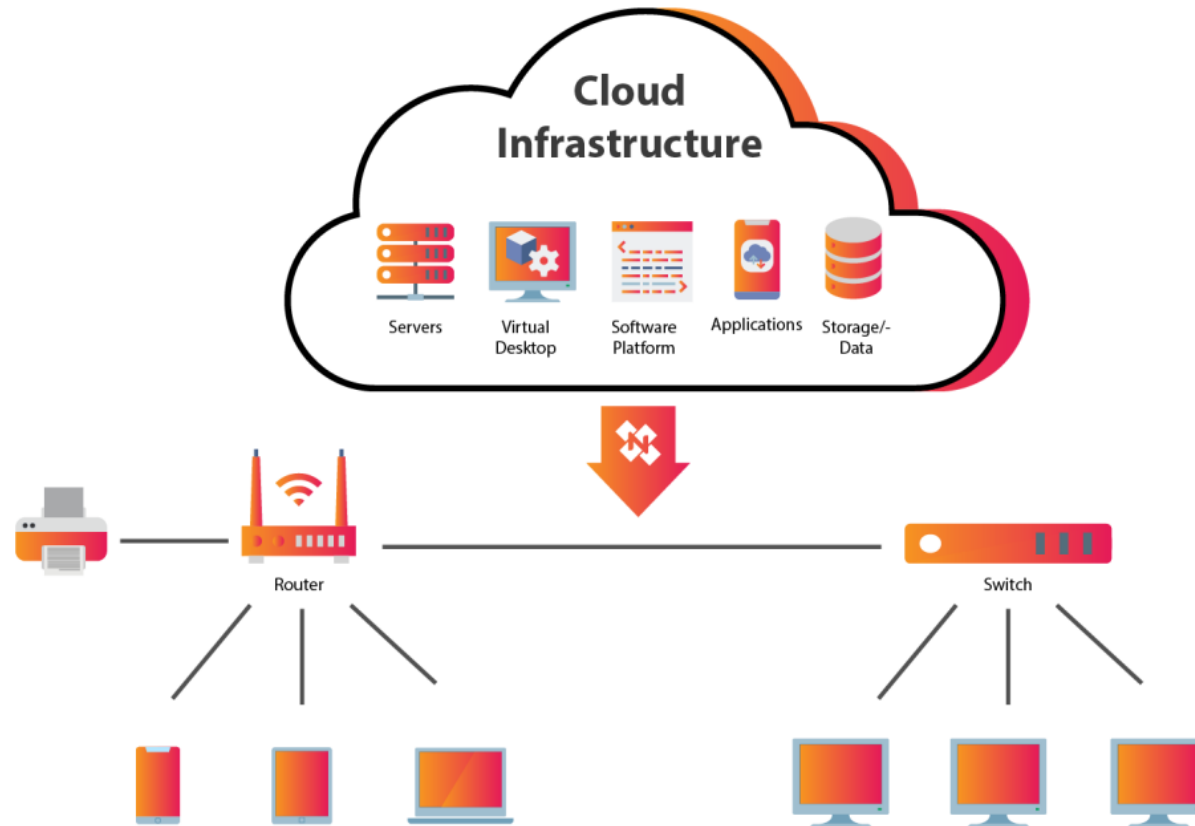
Deployment Automation

Advisor: Dr. Thai Minh Tuan

Student Name: Truong Dang Truc Lam

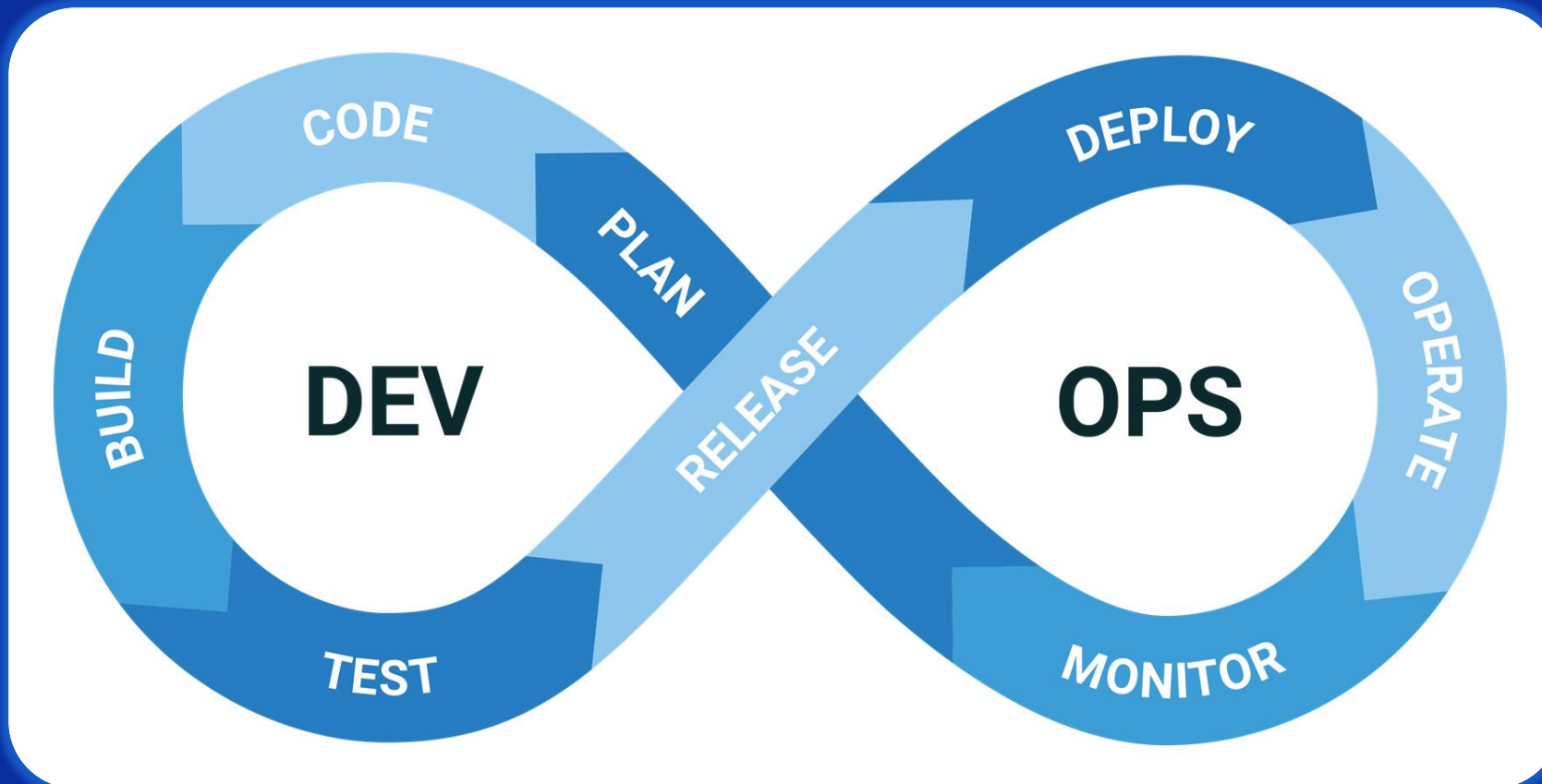
Student ID: B2111933

Cloud Computing



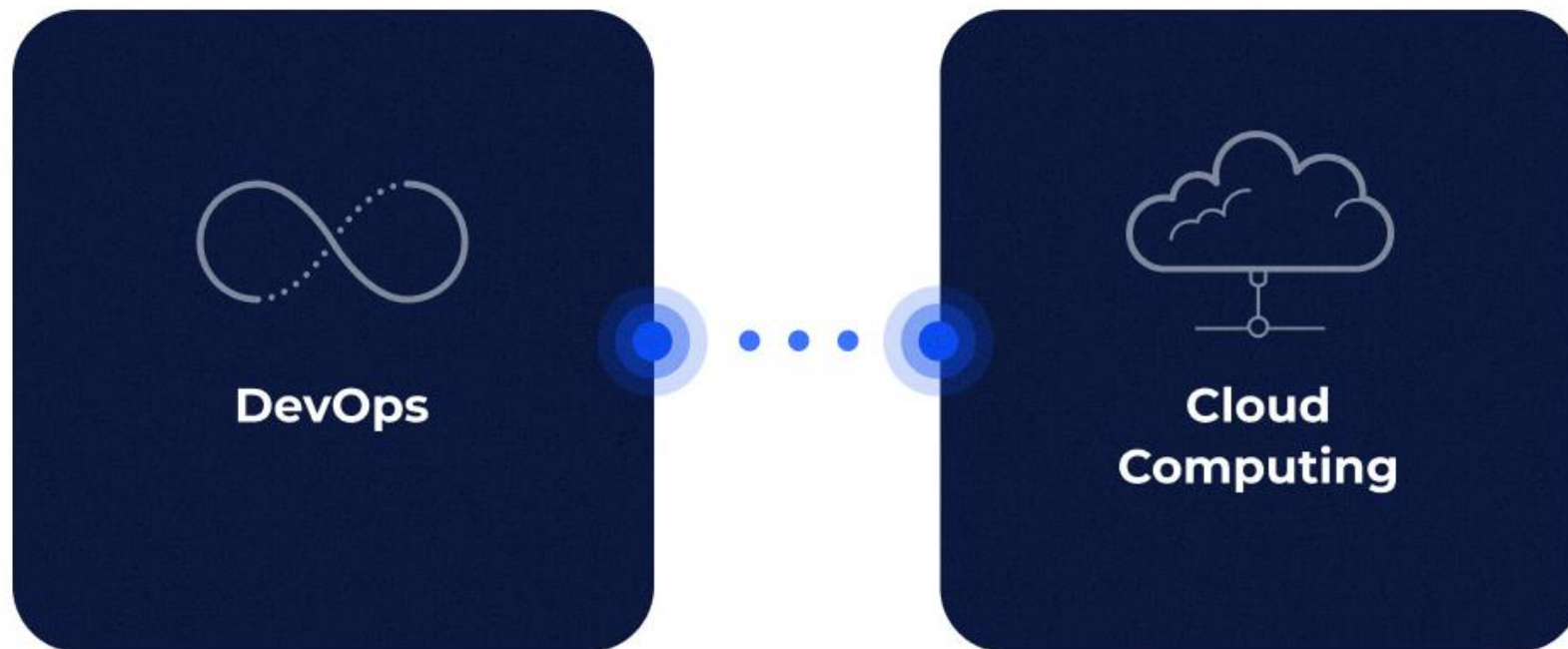
Source: NioyaTech IT/AI Solutions (Linkedin)

DevOps



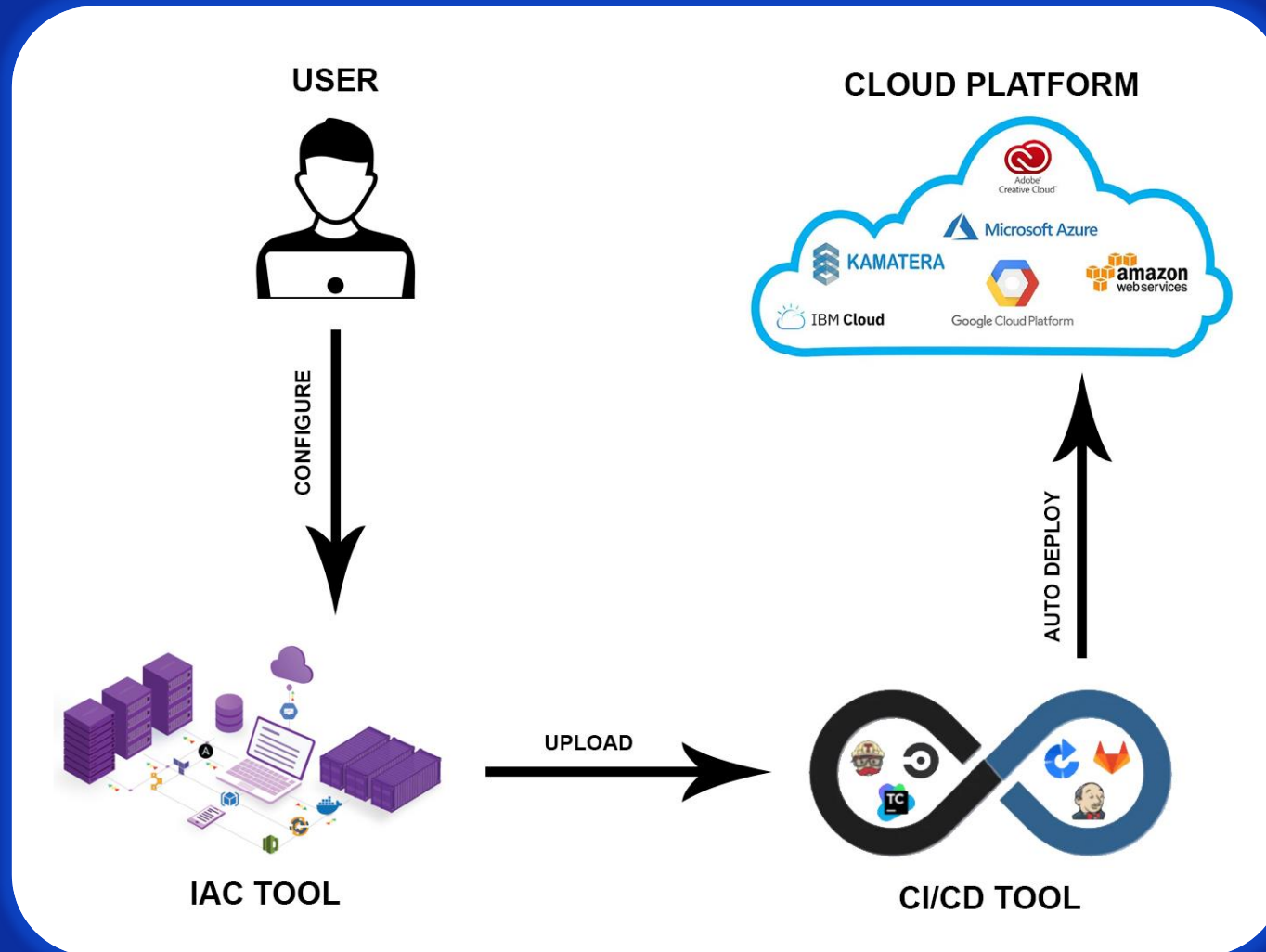
Source: csc.edu.vn

Deployment Automation

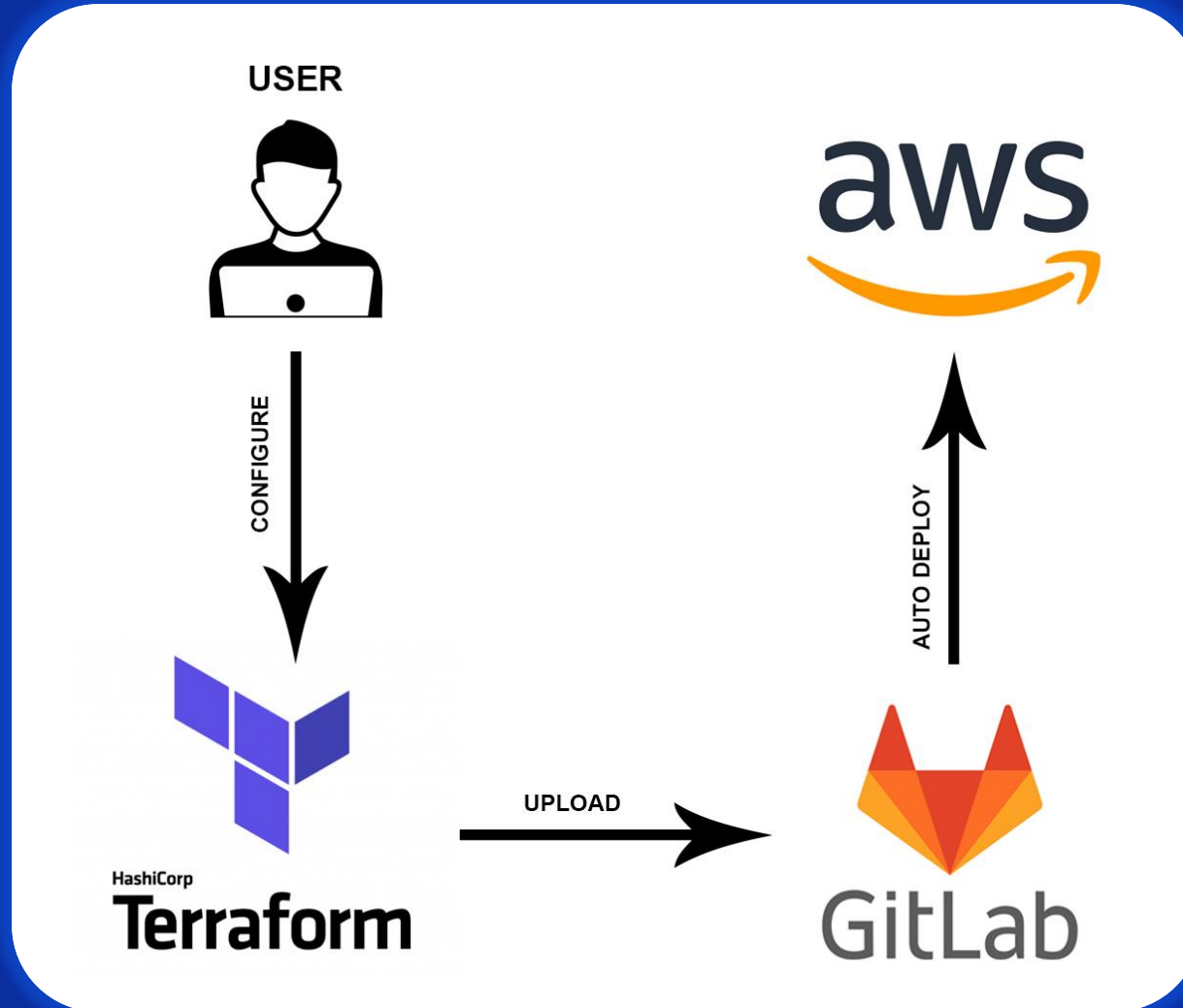


Source: sam-solutions.us

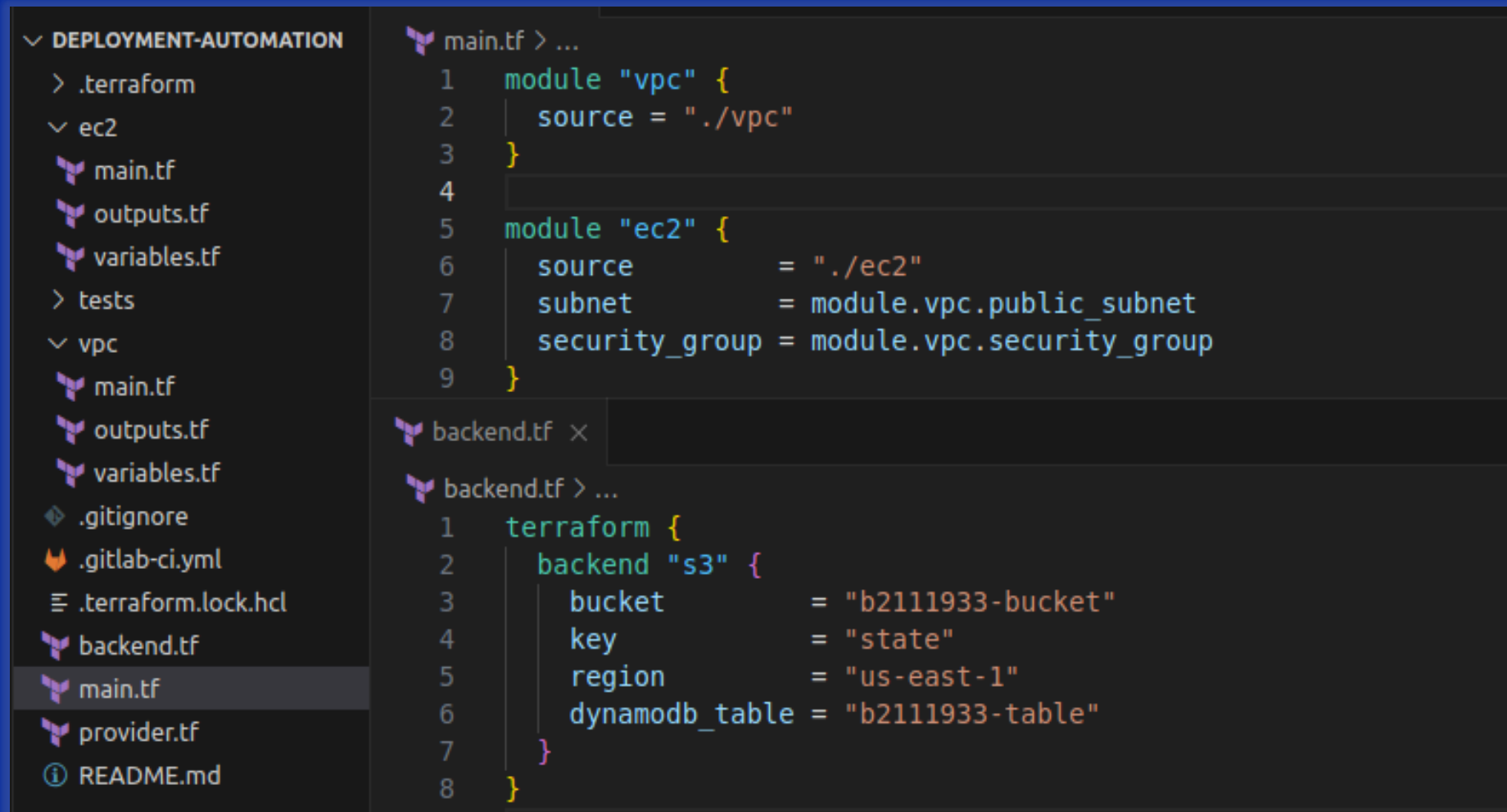
Conceptual Architecture



Detailed Architecture



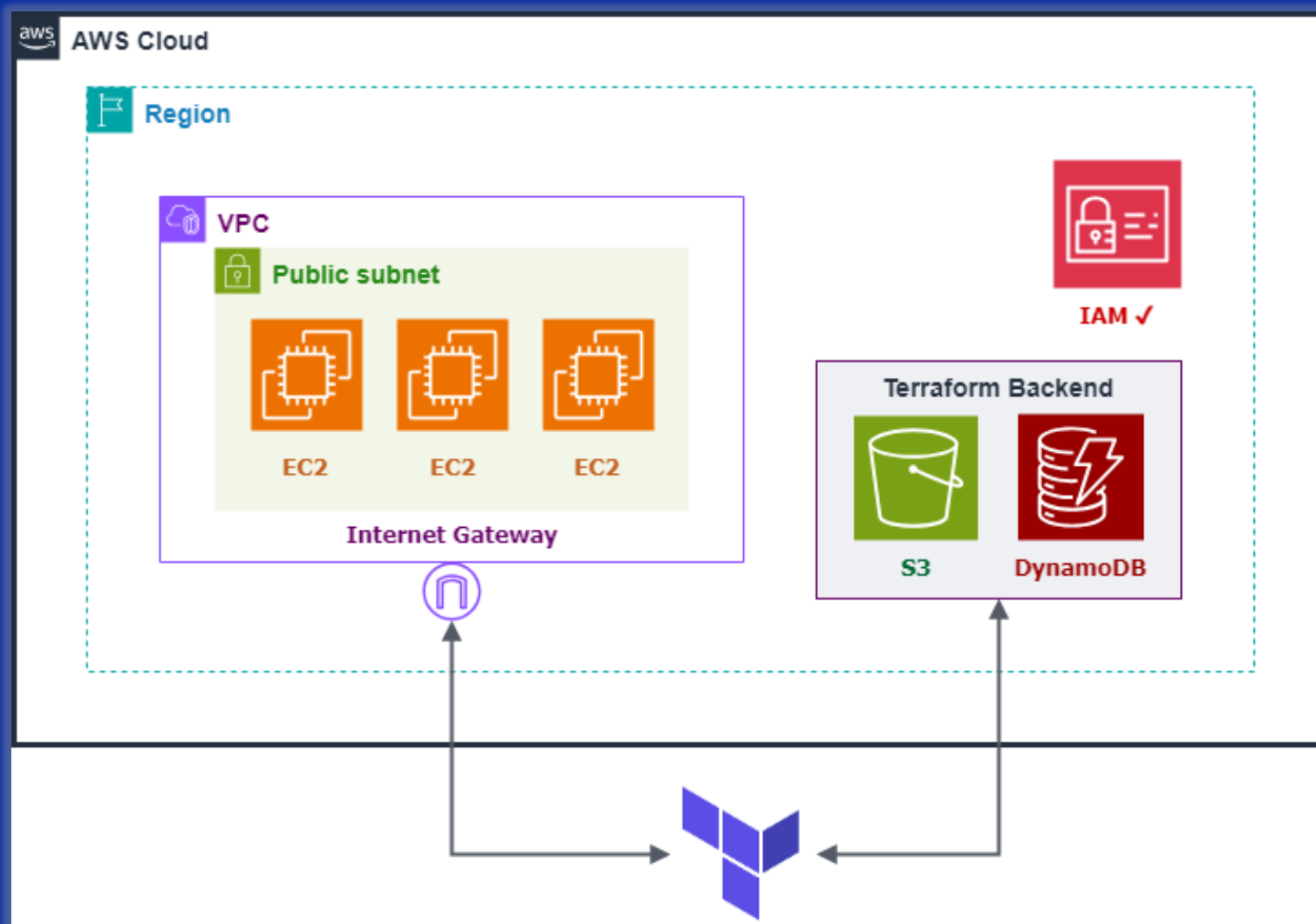
Terraform Configuration





```
main.tf > ...
1  module "vpc" {
2      source = "../vpc"
3  }
4
5  module "ec2" {
6      source           = "../ec2"
7      subnet           = module.vpc.public_subnet
8      security_group   = module.vpc.security_group
9  }

backend.tf ×
backend.tf > ...
1  terraform {
2      backend "s3" {
3          bucket     = "b2111933-bucket"
4          key         = "state"
5          region      = "us-east-1"
6          dynamodb_table = "b2111933-table"
7      }
8  }
```

AWS Resources

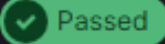



GitLab CI/CD Pipeline

  / Deployment Automation / Pipelines / #1529088774


test




Delete

 **Passed**

Truong Dang Truc Lam created pipeline for commit `0fcd5f24`  1 day ago, finished 1 day ago

For `main`

 **latest**



 5 jobs  7.55  7 minutes 32 seconds, queued for 0 seconds

Pipeline



Jobs 5

Tests 0



validate

 validate 



test

 test 



plan

 plan 

apply

 apply 

destroy





 destroy 

CTU

ĐẠI HỌC CẦN THƠ
Cộng đồng - Toàn diện - Ưu việt

The Result


[Alt+S]



N. Virginia ▼

lambobby007 ▼

Instances (3) [Info](#)

Last updated less than a minute ago 

Connect


Instance state ▼














Actions ▼

Launch instances ▼

All states ▼

< 1 >



<input type="checkbox"/>	Name 	Instance ID	Instance state	Instance type	Status check
<input type="checkbox"/>	B2111933 Amazon Linux	i-0248b9cdd37b0ce3c	 Running  	t2.micro	 Initializing
<input type="checkbox"/>	B2111933 Windows	i-0f56472453a7d68ae	 Running  	t2.micro	 Initializing
<input type="checkbox"/>	B2111933 Ubuntu	i-0cab71ea3824c4c71	 Running  	t2.micro	 Initializing

Easy For Upscaling

Instances (5) [Info](#)

Last updated less than a minute ago

Connect

Instance state ▼

Actions

All states ▼

Name	▲	Instance ID	Instance state ▼	Instance type ▼
B2111933 Amazon Linux		i-027e8f6b0d5e76648	✓ Running	t2.micro
B2111933 Amazon Linux		i-0f062067b8e38975a	✓ Running	t2.micro
B2111933 Amazon Linux		i-0a2f0a729744a026e	✓ Running	t2.micro
B2111933 Ubuntu		i-08e5e246e3a449f6c	✓ Running	t2.micro
B2111933 Windows		i-079e3acf524a3675d	✓ Running	t2.micro

Comparison

Method	Manual Deployment AWS	Automated Deployment AWS
Process	Infrastructure is provisioned and configured manually using AWS Management Console or CLI	Infrastructure is defined as code in Terraform and deployment is automated using GitLab CI/CD
Advantages	<ul style="list-style-type: none">Manually control each step of the processEasier to diagnose and resolve issues for small-scale projects	<ul style="list-style-type: none">Significantly reduce deployment time by automating repetitive tasksAutomated testing integrated into the CI/CD pipeline can guarantee reliabilityPromote standardization to ensure consistent configurations across environments
Disadvantages	<ul style="list-style-type: none">Manual processes are slow and repetitiveHuman error can lead to misconfigurationsDifficult to scale infrastructure efficientlyLack of standardization can lead to inconsistencies across environments	<ul style="list-style-type: none">Require knowledge of IaC and CI/CD toolsInitial setup can be time-consuming



Thank you for watching