




CI/CD Pipeline **on AWS infrastructure using Jenkins**

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DevOps is a software development approach to increase the efficiency, speed and security of development life cycle.

It involves:

- continuous development
- continuous testing
- continuous integration
- continuous deployment
- continuous monitoring

As a result, develop high-quality software and shorter development life cycle are competitive advantage for business and their customers.

Main goal of the project

I was interested to improve my skills and get new knowledge. Also I want to actualize my knowledge to nowadays reality in IT sphere.

I commenced from simple project (upload static web-site from GitHub to AWS S3 bucket using Jenkins). During this stage I was interested in infrastructure as code and decided to improve my project.

I can allocate next goals for me in this project:

- Practice in using AWS tools
- Learn Terraform (syntax, using variables)
- Bash scripting as a part of automatization for set-up Jenkins
- Using Jenkins file for create a pipeline
- Docker as a part of environment

Technology stack and tools are used in the project

- I. GitHub (Source control of project, includes: node.js site; terraform configs and scripts; docker configs; jenkinsfile)
- II. OS
 - Ubuntu 22.04 for EC2 instances
 - Alpine 3.16 for docker images
- III. AWS
 - EC2 Instances (Jenkins server – t2.small, Production server – t2.micro)
 - ECR (keep docker images for product, stage and test containers)
 - Secret Manager (store public and private keys for GitHub)
 - S3 Bucket (keep logs and test results, terraform backend - .tfstate, Jenkins server config scripts)
 - IAM (manage roles for aws resources)
 - VPC (define isolated network for instances and attach elastic IP)

Technology stack and tools are used in the project (continue)

IV. Docker (create images for test environment, stage and product environments)

V. Terraform providers

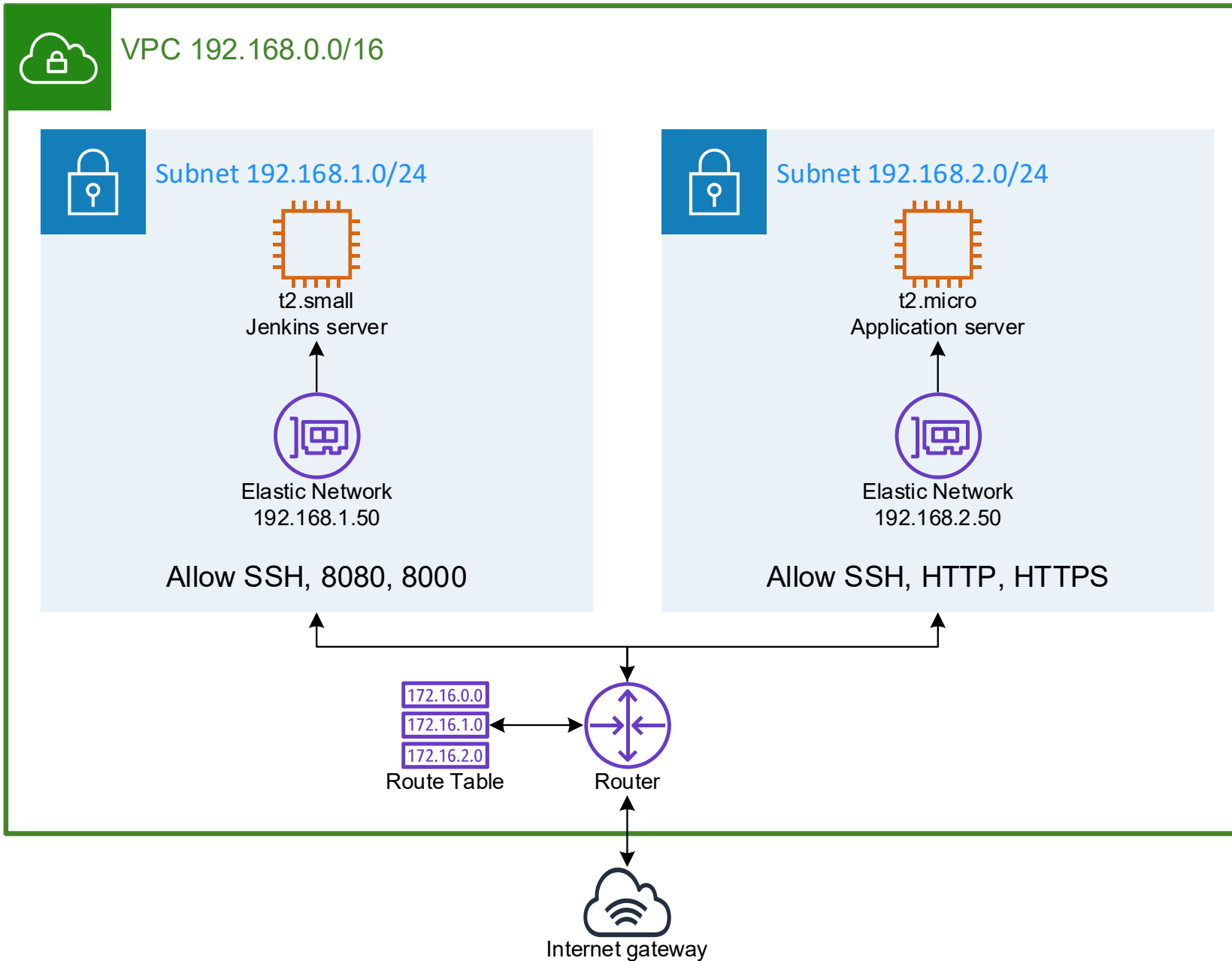
- aws (create aws infrastructure)
- local (is used to manage local resources, such as files)
- tls (create a key pairs)

VI. Jenkins (Multibranch CI/CD pipeline)

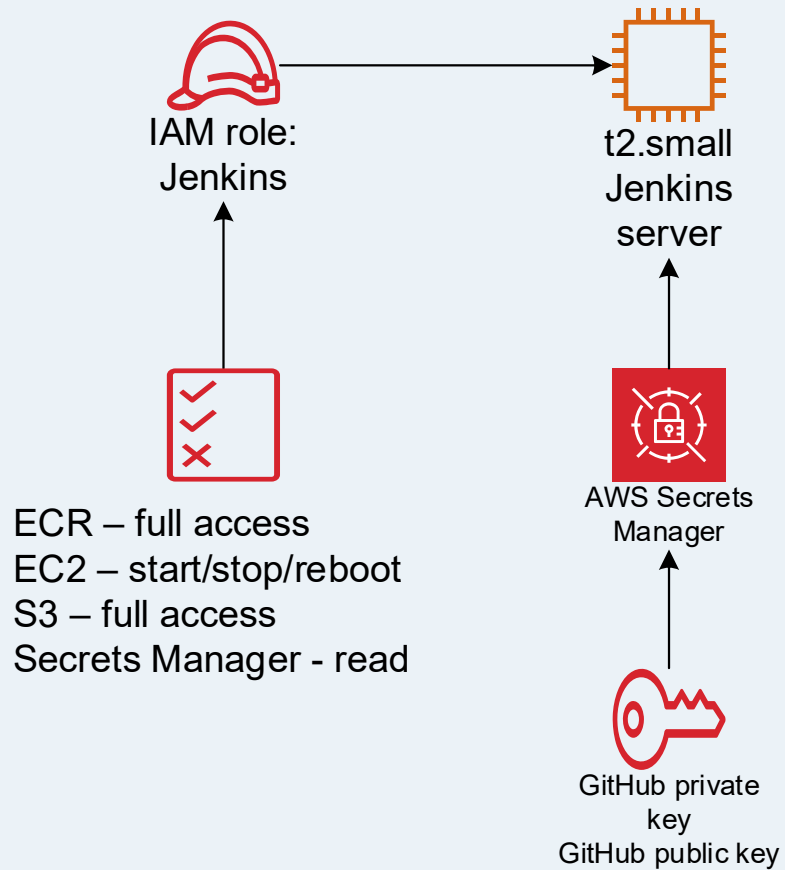
- BlueOcean (convenient visualization of pipeline process)
- Docker pipeline plugin

Project plan

- I. Configure local environment and deploy an application on virtual machine for testing the concept
- II. Create AWS infrastructure using Terraform
 - Terraform backend on s3 bucket
 - VPC infrastructure
 - IAM roles
 - EC2 instances
 - Keys for instances and GitHub
 - S3 buckets
 - ECR repositories
- III. Create Docker files with instructions for test and production images
- IV. Configure Jenkins and production server
 - user_data scripts
 - shell scripts for user_data (store on s3 bucket)
 - initial Jenkins set up using curl
- V. CI/CD Pipeline
 - create jenkinsfile



Jenkins permissions



Application permission

