Lab Exercise 17 – Scanning IaC Templates for Vulnerabilities

Name:-Vansh Bhatt

SapId:- 500125395

R.No:- R2142231689

Batch:- DevOps B1

To:- Hitesh Kumar Sharma Sir

Objective

- Learn how to scan Infrastructure as Code (IaC) templates for security vulnerabilities.
- Use open-source IaC security tools to detect misconfigurations.
- Understand common risks such as public access, unencrypted resources, and insecure network rules.

Prerequisites

- A Linux/Windows/Mac machine with:
    - Terraform installed (for sample IaC)
    - **Checkov** (pip install checkov) or **tfsec** (brew install tfsec or binary download)
- Git installed (optional, for version control of IaC templates)

Step 1: Create an Insecure IaC Template

Create a file named main.tf with the following Terraform code:

```
provider "aws" {
  region = "us-east-1"
}
resource "aws_s3_bucket" "insecure_bucket" {
  bucket = "my-insecure-bucket-lab"
  acl    = "public-read"
}
resource "aws_security_group" "insecure_sg" {
  name        = "insecure-sg"
  description = "Allow all inbound traffic"
```

```
 ingress {
  from_port   = 0
  to_port     = 65535
  protocol    = "tcp"
  cidr_blocks = ["0.0.0.0/0"]
 }
}
```

```hcl
provider "aws" {
  region = "ap-south-1"
}
resource "aws_s3_bucket" "insecure_bucket" {
  bucket = "my-insecure-bucket-lab"
  acl    = "public-read"
}
resource "aws_security_group" "insecure_sg" {
  name        = "insecure-sg"
  description = "Allow all inbound traffic"
  ingress {
    from_port   = 0
    to_port     = 65535
    protocol    = "tcp"
    cidr_blocks = ["0.0.0.0/0"]
  }
}
```

Step 2: Scan the Template with Checkov

Run Checkov on the current directory:

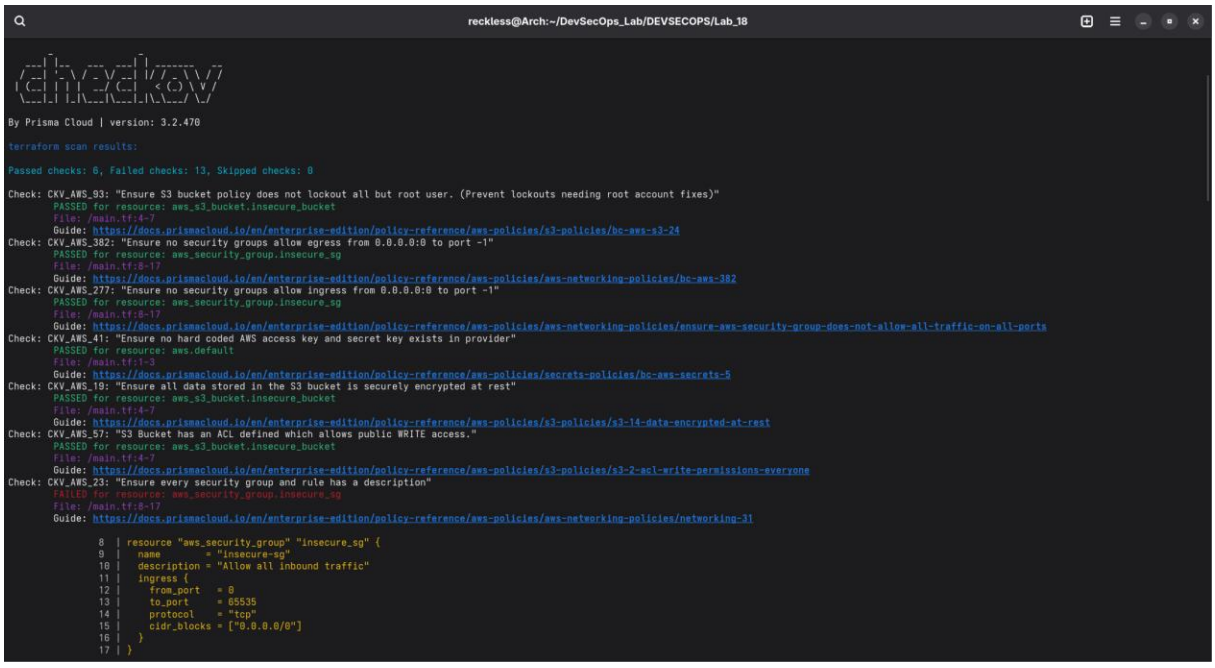
```
checkov -d .
```

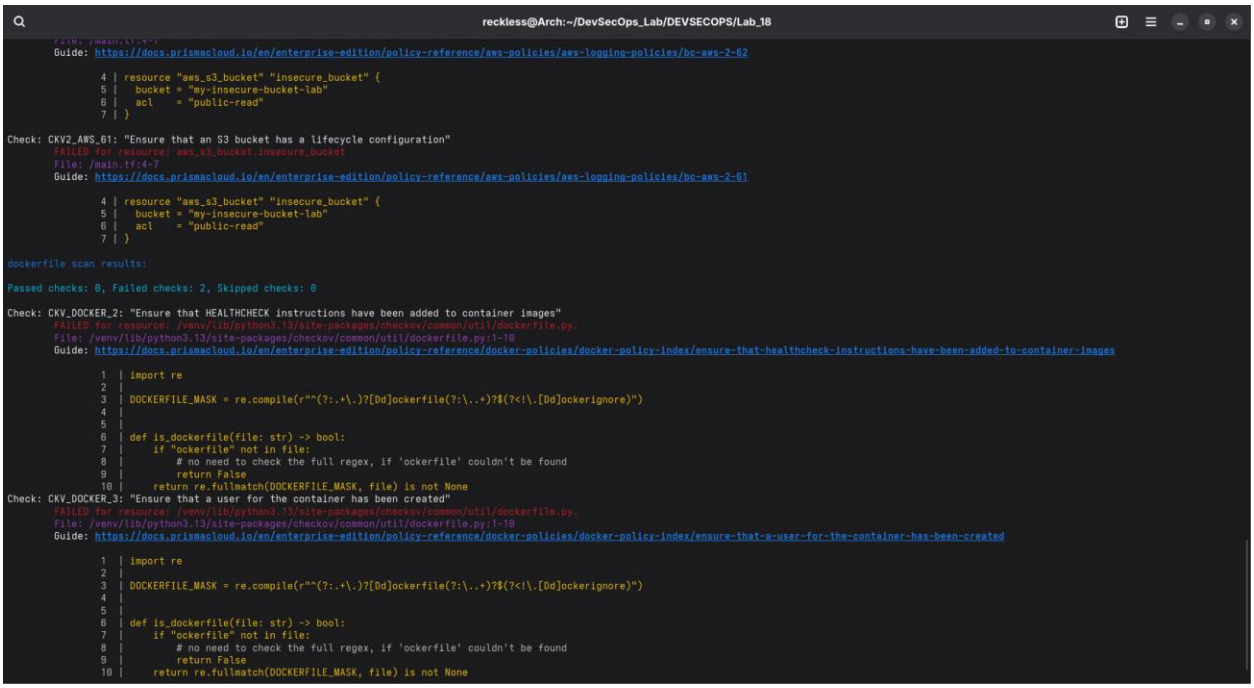
Expected Findings:

- Public S3 bucket access (public-read)
- Security group open to all inbound traffic

Expected Findings:

- Warns about S3 bucket without encryption
- Flags open Security Group rules





Step 4: Review the Report

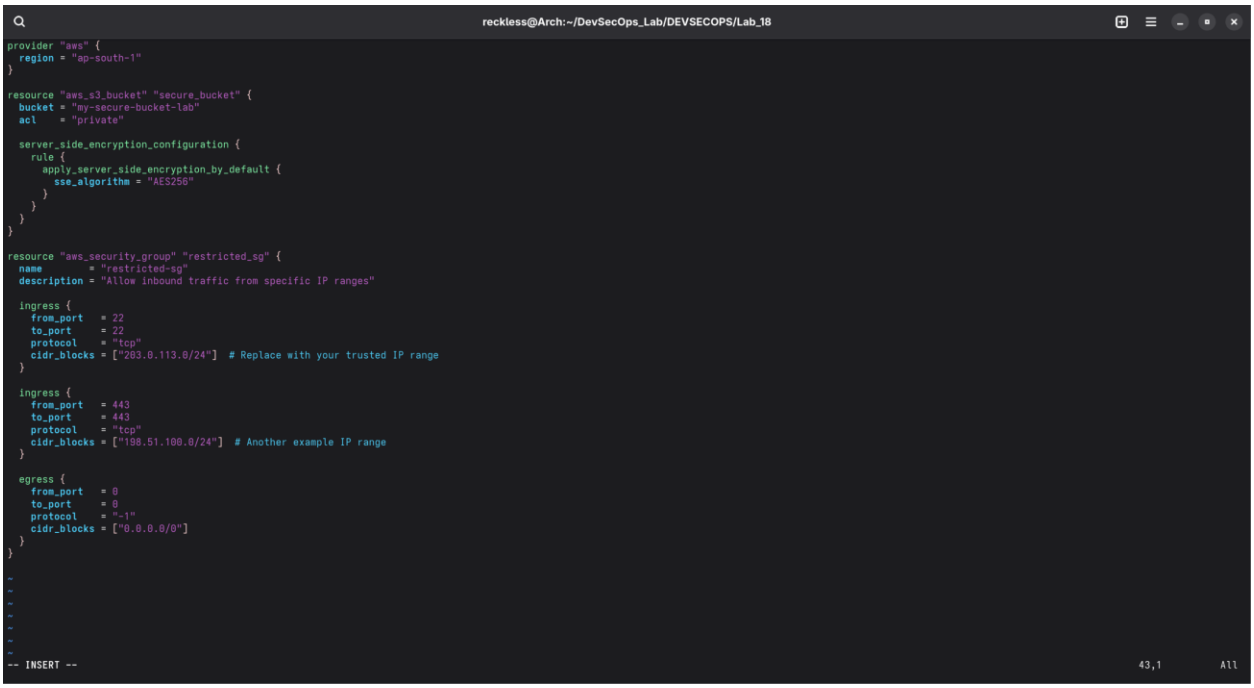
Example output (Checkov):

```
Check: CKV_AWS_20: "S3 Bucket allows public read access"

    FAILED for resource: aws_s3_bucket.insecure_bucket

Check: CKV_AWS_260: "Security group allows ingress from 0.0.0.0/0"

    FAILED for resource: aws_security_group.insecure_sg
```

Step 5: Apply Fixes (Optional)

Modify the IaC template to:

- Set S3 bucket ACL to private
- Enable encryption (AES256)
- Restrict Security Group to specific IP ranges

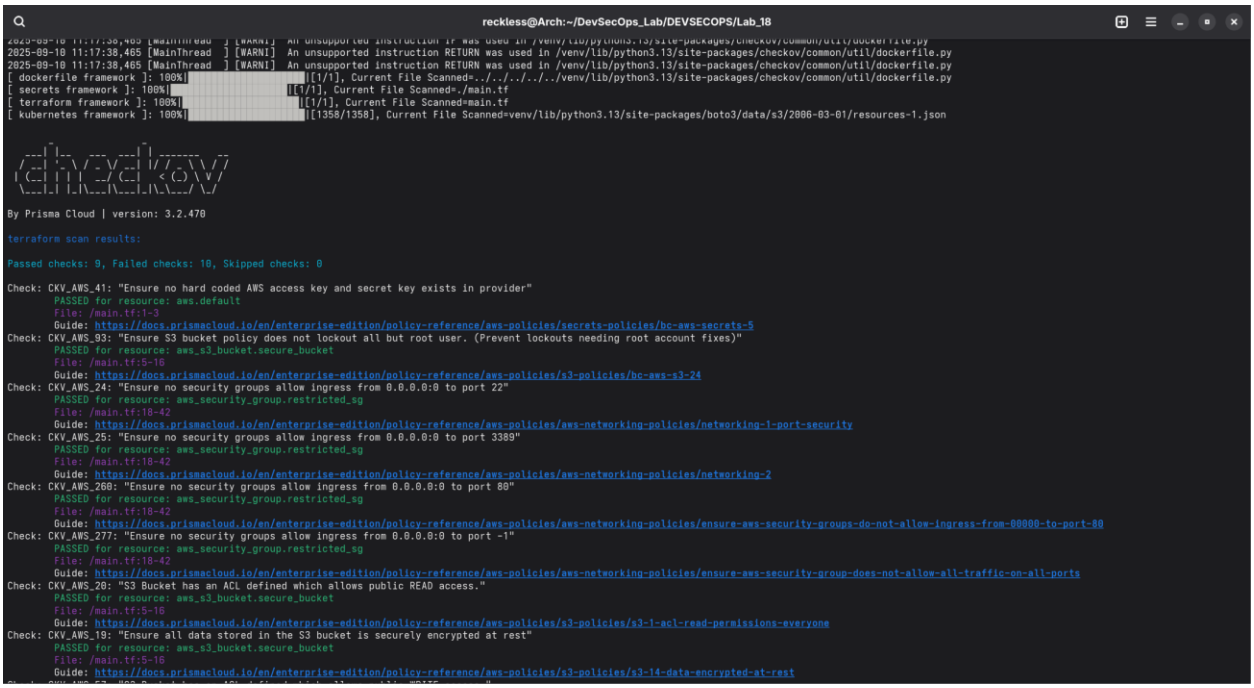


Step 6: Rescan the Template

Run the scan again:

```
checkov -d .
```

Now the findings should be **resolved or reduced**.



Step 7: Document Findings

Create a simple findings log:

DevSecOps Audit Log – Terraform Hardening

Date: 10 September 2025 **Engineer:** Sreyas **Environment:** Lab_18 (Arch Linux) **Tooling:** Terraform + Checkov v3.2.470

🔧 Changes Made to IaC Template

Component	Action Taken	Status
S3 Bucket ACL	Changed from public-read to private	✅ Secured
S3 Encryption	Enabled AES256 encryption	✅ Secured
S3 Versioning	Not enabled initially	❌ Failed

Component	Action Taken	Status
S3 KMS Encryption	Not configured (AES256 used)	❌ Failed
S3 Replication	Not configured	❌ Failed
Security Group	Ingress restricted to specific IP ranges	✅ Secured
SG Descriptions	Missing on ingress/egress rules	❌ Failed
SG Egress	Allowed all outbound traffic	❌ Failed
SG Attachment	Not attached to any EC2 or ENI	❌ Failed