Lab Exercise 18- Scanning IaC Templates for Vulnerabilities

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)

```
PS C:\Users\ ASUS > pip install checkov
Collecting checkov
  Downloading checkov-3.2.471-py3-none-any.whl.metadata (26 kB)
Collecting bc-python-hcl2==0.4.3 (from checkov)
  Downloading bc_python_hcl2-0.4.3-py3-none-any.whl.metadata (4.
2 kB)
Collecting bc-detect-secrets==1.5.45 (from checkov)
  Downloading bc_detect_secrets-1.5.45-py3-none-any.whl.metadata
 (23 kB)
```

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"]
  }
}
```

Step 2: Scan the Template with Checkov

Run Checkov on the current directory:

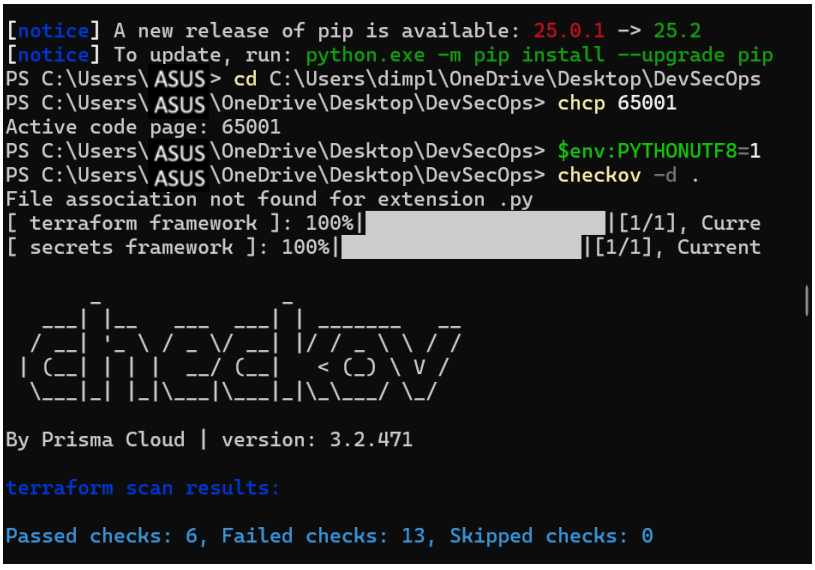
```
checkov -d .
```

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

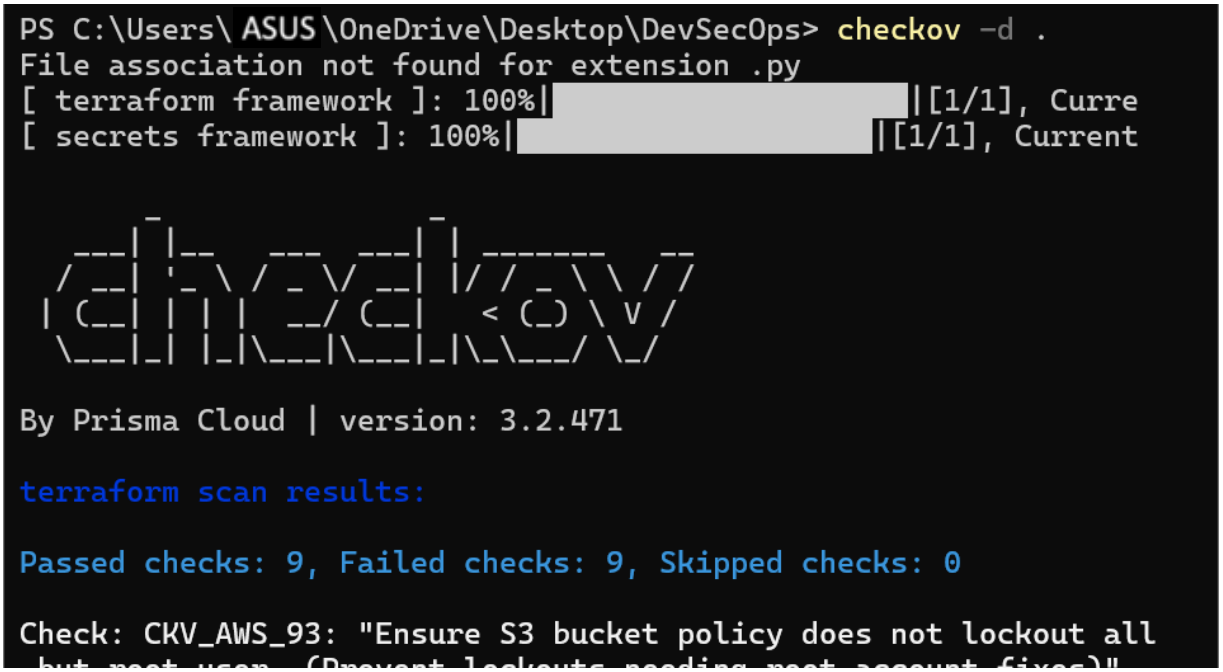
Run the scan again:

```
checkov -d .
```

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

Step 7: Document Findings

Create a simple findings log:



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