

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.
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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

```
[notice] A new release of pip is available: 25.0.1 -> 25.2
[notice] To update, run: python.exe -m pip install --upgrade pip
PS C:\Users\ASUS> cd C:\Users\dimpl\OneDrive\Desktop\DevSecOps
PS C:\Users\ASUS\OneDrive\Desktop\DevSecOps> chcp 65001
Active code page: 65001
PS C:\Users\ASUS\OneDrive\Desktop\DevSecOps> $env:PYTHONUTF8=1
PS C:\Users\ASUS\OneDrive\Desktop\DevSecOps> checkov -d .
File association not found for extension .py
[ terraform framework ]: 100%|██████████| [1/1], Current
[ secrets framework ]: 100%|██████████| [1/1], Current
```

```

  _ _ _ _ _
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| ( _ _ ) |
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  _ _ _ _ _

```

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terraform scan results:

Passed checks: 6, Failed checks: 13, Skipped checks: 0

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:

```
PS C:\Users\ASUS\OneDrive\Desktop\DevSecOps> checkov -d .
File association not found for extension .py
[ terraform framework ]: 100%|██████████|[[1/1], Current
[ secrets framework ]: 100%|██████████|[[1/1], Current
```

The logo for checkov, featuring the word "checkov" in a stylized, dashed font.

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terraform scan results:

Passed checks: 9, Failed checks: 9, Skipped checks: 0

Check: CKV_AWS_93: "Ensure S3 bucket policy does not lockout all
but root user. (Prevent lockouts needing root account fixes)"