

# SonarQube + Terraform + Jenkins

SonarQube carries out a continuous scanning of code to ensure the quality and security of code. It is a cross-platform static code analysis tool that automatically reviews the code for bugs, security-related vulnerabilities, and code smells. It helps in keeping the code clean, besides easy to read and understand. SonarQube provides reports on its dashboard regarding: Duplicate Code Standard, complexity, and coverage of code Possible bugs Unit Tests Comments Security-related vulnerabilities Features of SonarQube Set Different rules for Different Projects SonarQube allows you to set a different set of rules for different projects by creating Quality Profiles. Each project can have its own specific set of rules depending upon the project's needs. Execution Pathways Bug Detection If the project involves data flow or interaction between different modules, SonarQube is capable of detecting and reporting the bugs in these execution pathways. Smoother Workflow SonarQube can continue to work in the background to identify and report errors during the development phase. It can be integrated with deployment tools and/or integration tools.

## **SonarQube:**

1. Static code analysis to avoid Manual reviews
2. To validate the source code before executed/compiled
3. To identify bugs
4. To check the code was secure from Vulnerabilities
5. To avoid duplicated code and smell
6. To Test the code based on Unit Test
7. More check by adding proper rules to validate the Static code

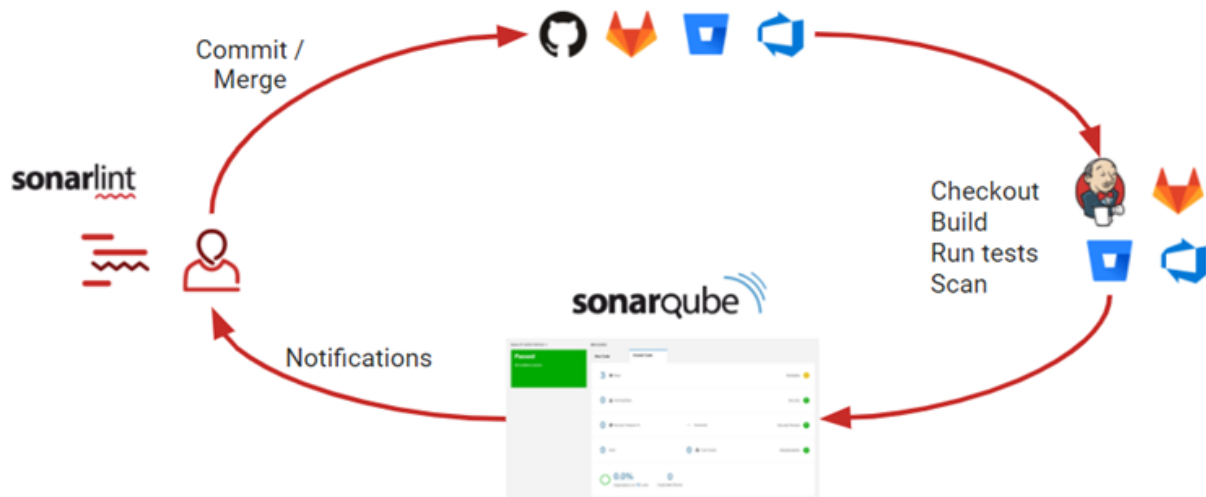
## **Advantages:**

1. It acts like a "Quality Management Tool"
  1. Code Analysis
  2. Test Reports
  3. Code Coverage
  4. Vulnerabilities

## **Components of SonarQube**

1. Rules --> Instructions to validate the code (default/custom)
2. Database (PostgreSQL) to store analysis report
3. Web Interface

4. ElasticSearch to search required data
5. SonarScanner (client machine)
  1. It runs on code where it should get executed
  2. It collects required information from source code (GitHub, GitLab etc.,)
  3. It will also pulls the rules that are applicable
  4. It gathers the report and published to SonarQube Server (Database --> PostgreSQL)



### Jenkins Plugins:

SonarQube Scanner

Terraform

### On Jenkins server:

<https://learn.hashicorp.com/tutorials/terraform/install-cli>

### How to install and configure SonarQube on Ubuntu 20.04 LTS Server?

[https://www.vultr.com/docs/install-sonarqube-on-ubuntu-20-04-lts/?utm\\_source=google-apac&utm\\_medium=paidmedia&obility\\_id=16876059738&utm\\_adgroup=&utm\\_campaign=&utm\\_term=&utm\\_content=&gclid=CjwKCAjw7cGUBhA9EiwArBAvokm-xUXewpnhsT4N2t8b8VG5Gbs3X118\\_EXp9pfTC0k6fw7wquiagBoCuV0QAvD\\_BwE](https://www.vultr.com/docs/install-sonarqube-on-ubuntu-20-04-lts/?utm_source=google-apac&utm_medium=paidmedia&obility_id=16876059738&utm_adgroup=&utm_campaign=&utm_term=&utm_content=&gclid=CjwKCAjw7cGUBhA9EiwArBAvokm-xUXewpnhsT4N2t8b8VG5Gbs3X118_EXp9pfTC0k6fw7wquiagBoCuV0QAvD_BwE)

**Version:** sonarqube-9.4.0.54424

**Port:** 9000

Global Tool Configuration

Add SonarScanner for MSBuild

List of SonarScanner for MSBuild installations on this system

SonarQube Scanner

SonarQube Scanner installations

Add SonarQube Scanner

SonarQube Scanner

Name

sonarqube-1

☒ Install automatically ?

Install from Maven Central

Version

SonarQube Scanner 4.7.0.2747

Add Installer

Delete Installer

Delete SonarQube Scanner

Add SonarQube Scanner

List of SonarQube Scanner installations on this system

configuration

SonarQube servers

☐ Environment variables Enable injection of SonarQube server configuration as build environment variables  
If checked, job administrators will be able to inject a SonarQube server configuration as environment variables in the build.

SonarQube installations

Name

sonarqube-1

Server URL

http://3.95.17.159:9000/

Default is http://localhost:9000

Server authentication token

sonarqube-token

Add

SonarQube authentication token. Mandatory when anonymous access is disabled.

Advanced...

Delete SonarQube

Add SonarQube

List of SonarQube installations

A

Administrator

Profile

Security

Notifications

Projects

Tokens

If you want to enforce security by not providing credentials of a real SonarQube user to run your code scan or to invoke web services, you can provide a User Token as a replacement of the user login. This will increase the security of your installation by not letting your analysis user's password going through your network.

Generate Tokens

Enter Token Name

Generate

Name	Last use	Created	
jenkins-terraform	< 1 hour ago	May 27, 2022	Revoke

Dashboard

Credentials

New Item

People

Build History

Project Relationship

Check File Fingerprint

Manage Jenkins

My Views

New View

Build Queue

No builds in the queue.

Build Executor Status

1 Idle

2 Idle

T

P

Store

Domain

ID

Name

		Jenkins	(global)	jenkins-aws-secret-key-id	jenkins-aws-secret-key-id
		Jenkins	(global)	jenkins-aws-secret-access-key	jenkins-aws-secret-access-key
		Jenkins	(global)	sonarqube-token	sonarqube-token

Icon: S M L

Stores scoped to Jenkins

P	Store	Domains
	Jenkins	(global)

```
root@ubuntudockerserver:~/aws-terraform-demo/variables/input# cat sonar-project.properties
sonar.projectKey=terraform
root@ubuntudockerserver:~/aws-terraform-demo/variables/input#
```

## Jenkinsfile

```
pipeline {
  agent any
  environment {
    AWS_ACCESS_KEY_ID      = credentials('jenkins-aws-secret-key-id')
    AWS_SECRET_ACCESS_KEY = credentials('jenkins-aws-secret-access-key')
  }
  stages {
    stage('Terraform Initialization') {
      steps {
        sh 'terraform init'
        sh 'pwd'
        sh 'ls -al'
        sh 'printenv'
      }
    }
    stage('SonarQube Analysis') {
      steps {
        script {
          def scannerHome = tool 'sonarqube-1';
          withSonarQubeEnv('sonarqube-1') {
            sh "${scannerHome}/bin/sonar-scanner"
          }
        }
      }
    }
  }
}
```

```
}
stage('Terraform Format') {
  steps {
    sh 'terraform fmt -check'
  }
}
stage('Terraform Validate') {
  steps {
    sh 'terraform validate'
  }
}
stage('Terraform Planning') {
  steps {
    sh 'terraform plan -no-color'
  }
}
stage('Terraform Apply') {
  steps {
    sh 'terraform apply -auto-approve'
  }
}
stage('Terraform Destroy') {
  steps {
    sh 'terraform destroy -auto-approve'
  }
}
}
```

3.95.17:159:9000/dashboard?id=terraform

sonarqube Projects Issues Rules Quality Profiles Quality Gates Administration

terraform master

May 27, 2022, 7:11 PM Version not provided

Overview Issues Security Hotspots Measures Code Activity

Project Settings Project Information

QUALITY GATE STATUS @

**Passed**  
All conditions passed.

MEASURES

New Code Overall Code

0 Bugs Reliability A

0 Vulnerabilities Security A

1 Security Hotspots @ 0.0% Reviewed Security Review E

0 Debt 0 Code Smells Maintainability A

0.0% Duplications on 78 Lines 0 Duplicated Blocks

```
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (SonarQube Analysis)
[Pipeline] script
[Pipeline] {
[Pipeline] tool
Unpacking https://repo1.maven.org/maven2/org/sonarsource/scanner/cli/sonar-scanner-
cli/4.7.0.2747/sonar-scanner-cli-4.7.0.2747.zip to
/var/lib/jenkins/tools/hudson.plugins.sonar.SonarRunnerInstallation/sonarqube-1 on Jenkins
[Pipeline] withSonarQubeEnv
Injecting SonarQube environment variables using the configuration: sonarqube-1
[Pipeline] {
[Pipeline] sh
+ /var/lib/jenkins/tools/hudson.plugins.sonar.SonarRunnerInstallation/sonarqube-
1/bin/sonar-scanner
INFO: Scanner configuration file:
/var/lib/jenkins/tools/hudson.plugins.sonar.SonarRunnerInstallation/sonarqube-1/conf/sonar-
scanner.properties
INFO: Project root configuration file: /var/lib/jenkins/workspace/Sonarqube/sonar-
project.properties
INFO: SonarScanner 4.7.0.2747
INFO: Java 11.0.15 Private Build (64-bit)
INFO: Linux 5.13.0-1022-aws amd64
INFO: User cache: /var/lib/jenkins/.sonar/cache
INFO: Scanner configuration file:
/var/lib/jenkins/tools/hudson.plugins.sonar.SonarRunnerInstallation/sonarqube-1/conf/sonar-
```

```
scanner.properties
INFO: Project root configuration file: /var/lib/jenkins/workspace/Sonarqube/sonar-
project.properties
INFO: Analyzing on SonarQube server 9.4.0
INFO: Default locale: "en", source code encoding: "UTF-8" (analysis is platform dependent)
INFO: Load global settings
INFO: Load global settings (done) | time=96ms
INFO: Server id: 92D88F0A-AYEFhGdqVxMZ3aiCOV3H
INFO: User cache: /var/lib/jenkins/.sonar/cache
INFO: Load/download plugins
INFO: Load plugins index
INFO: Load plugins index (done) | time=78ms
INFO: Load/download plugins (done) | time=3245ms
INFO: Process project properties
INFO: Process project properties (done) | time=1ms
INFO: Execute project builders
INFO: Execute project builders (done) | time=2ms
INFO: Project key: terraform
INFO: Base dir: /var/lib/jenkins/workspace/Sonarqube
INFO: Working dir: /var/lib/jenkins/workspace/Sonarqube/.scannerwork
INFO: Load project settings for component key: 'terraform'
INFO: Load project settings for component key: 'terraform' (done) | time=42ms
INFO: Auto-configuring with CI 'Jenkins'
INFO: Load quality profiles
INFO: Load quality profiles (done) | time=71ms
INFO: Load active rules
INFO: Load active rules (done) | time=1452ms
INFO: Load project repositories
INFO: Load project repositories (done) | time=19ms
INFO: Indexing files...
INFO: Project configuration:
INFO: 10 files indexed
INFO: 0 files ignored because of scm ignore settings
INFO: Quality profile for terraform: Sonar way
INFO: ----- Run sensors on module terraform
INFO: Load metrics repository
INFO: Load metrics repository (done) | time=40ms
INFO: Sensor JaCoCo XML Report Importer [jacoco]
INFO: 'sonar.coverage.jacoco.xmlReportPaths' is not defined. Using default locations:
target/site/jacoco/jacoco.xml,target/site/jacoco-
it/jacoco.xml,build/reports/jacoco/test/jacocoTestReport.xml
INFO: No report imported, no coverage information will be imported by JaCoCo XML Report
Importer
INFO: Sensor JaCoCo XML Report Importer [jacoco] (done) | time=7ms
INFO: Sensor IaC Terraform Sensor [iac]
INFO: 5 source files to be analyzed
INFO: 5/5 source files have been analyzed
```

```
INFO: Sensor IaC Terraform Sensor [iac] (done) | time=254ms
INFO: Sensor CSS Rules [javascript]
INFO: No CSS, PHP, HTML or VueJS files are found in the project. CSS analysis is skipped.
INFO: Sensor CSS Rules [javascript] (done) | time=1ms
INFO: Sensor C# Project Type Information [csharp]
INFO: Sensor C# Project Type Information [csharp] (done) | time=1ms
INFO: Sensor C# Analysis Log [csharp]
INFO: Sensor C# Analysis Log [csharp] (done) | time=14ms
INFO: Sensor C# Properties [csharp]
INFO: Sensor C# Properties [csharp] (done) | time=1ms
INFO: Sensor HTML [web]
INFO: Sensor HTML [web] (done) | time=3ms
INFO: Sensor Text Sensor [text]
INFO: 5 source files to be analyzed
INFO: 5/5 source files have been analyzed
INFO: Sensor Text Sensor [text] (done) | time=7ms
INFO: Sensor VB.NET Project Type Information [vbnet]
INFO: Sensor VB.NET Project Type Information [vbnet] (done) | time=0ms
INFO: Sensor VB.NET Analysis Log [vbnet]
INFO: Sensor VB.NET Analysis Log [vbnet] (done) | time=16ms
INFO: Sensor VB.NET Properties [vbnet]
INFO: Sensor VB.NET Properties [vbnet] (done) | time=0ms
INFO: ----- Run sensors on project
INFO: Sensor Zero Coverage Sensor
INFO: Sensor Zero Coverage Sensor (done) | time=0ms
INFO: SCM Publisher SCM provider for this project is: git
INFO: SCM Publisher 5 source files to be analyzed
INFO: SCM Publisher 5/5 source files have been analyzed (done) | time=119ms
INFO: CPD Executor Calculating CPD for 0 files
INFO: CPD Executor CPD calculation finished (done) | time=0ms
INFO: Analysis report generated in 91ms, dir size=117.6 kB
INFO: Analysis report compressed in 20ms, zip size=19.6 kB
INFO: Analysis report uploaded in 39ms
INFO: ANALYSIS SUCCESSFUL, you can find the results at: http://3.95.17.159:9000/dashboard?
id=terraform
INFO: Note that you will be able to access the updated dashboard once the server has
processed the submitted analysis report
INFO: More about the report processing at http://3.95.17.159:9000/api/ce/task?
id=AYEFwE0dVxMZ3aiCObPl
INFO: Analysis total time: 5.062 s
INFO: -----
INFO: EXECUTION SUCCESS
INFO: -----
INFO: Total time: 10.135s
INFO: Final Memory: 16M/60M
INFO: -----
[Pipeline] }
```



```
[Pipeline] // withSonarQubeEnv  
[Pipeline] }  
[Pipeline] // script  
[Pipeline] }
```