Code coverage with SonarQube

Internal reference: topics/06-3.md

Introduction

SonarQube is a Java-based open-source code coverage tool. Beside running code coverage, it allows static code analysis to evaluate the reliability and security of a program. With `SonarQube`, development teams may use fully customizable reports and a dashboard to show the quality of the code in their apps.

This program can analyze the static code of more than 25 languages, including PHP: Hypertext Preprocessor (PHP), Java,.NET, JavaScript, Python, and others. For a complete list, go to the SonarQube docs.

SonarQube also provides code analysis for security issues, code smells, and code duplication, as well as code coverage for unit tests.

Constraints of SonarQube

As a reminder: Test coverage statistics and test execution reports will show you how much of your code is covered by your test cases.

SonarQube cannot determine coverage by itself. Set up of a third-party coverage tool is therefore required in order to import data into SonarQube. The right `SonarScanner` configuration is required in order to integrate code analysis into your build procedure.

Getting started

The following procedure describes steps to set up SonarQube code coverage using JavaScript As prerequisites you should have the following components installed on your system:

- NodeJS
- Docker
- A text editor or IDE

Step 1: Download and start SonarQube

SonarQube must be run on servers or virtual machines because it is an on-premise solution (VMs). Without having to explicitly configure the server on your system, starting up an instance can be

replaced by installing a Docker container from the Sonar image.

```
docker pull sonarqube:latest
docker run -d --name sonarqube -p 9000:9000 sonarqube:latest
```

Once your instance is up and running, you can log in and access the sonarqube instance from your local browser through http://localhost:9000 using System Administrator default credentials.

```
login: admin
password: admin
```

Step 2: Create a new project

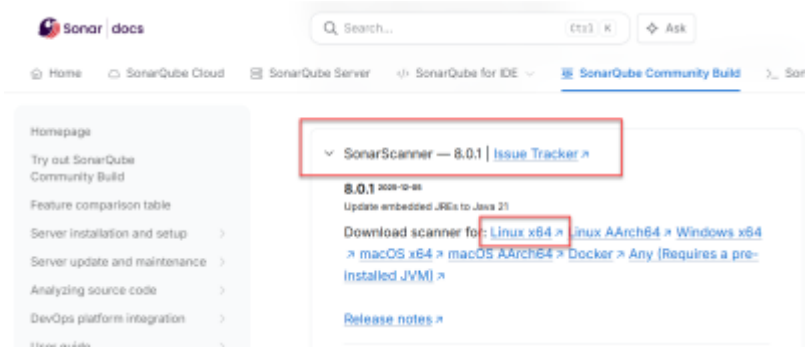
- As Project type select `Create a local Project`
- Then set `Project display name and key` and the `main branch name (default: main)`.
- Hit the button `Next`
- Select `Follows the instance's default`
- Hit the button `Create project`

Step 3: Analysis method

- As analysis method select `Locally`
- Generate the `Token name` (Expiration in 30 days is ok)
- Save the generated token and handle it as password.
- Hit the button `Continue`
- Run analysis on your project: `Other` → `Linux`

Step 4: Download and unzip the scanner

- Download the scanner for your platform.



- Unzip it either in your project directory or in your binary-directory.

Example for Linux on AWS EC2

```
wget -N
https://binaries.sonarsource.com/<whatever-path>/sonar-scanner-cli-<whatever
-version>-linux-x64.zip
sudo apt install unzip
unzip -o sonar-scanner-cli-<whatever-version>-linux-x64.zip
```

- Add the `bin` directory of the unzipped folder in your PATH variable and check with command `whereis`. Example:

```
whereis sonar-scanner
sonar-scanner: /home/ubuntu/sonar/bin/sonar-scanner
```

- Check before running code coverage that your target app (i.e. traffic light api) has the following node package are installed.

```
dependencies: {
    ...
    @types/jest: ^29.5.11,
    jest: ^29.7.0,
    jest-sonar-reporter: ^2.0.0,
    sonarqube-scanner: ^4.2.6,
    supertest: ^6.3.3
}
```

- Create in your project folder a file `sonar-project.properties`. Here you can store your settings, especially project-key, source-path, SonarQube host url and token. In the example the code source is in directory `src` and unit tests are on the same directory level in directory `tests`.

```
#SonarQube configuration for server connection
sonar.projectKey=??
sonar.host.url=http://localhost:9000
sonar.token=??
sonar.sources=??
sonar.exclusions=
sonar.test=tests
sonar.language=javascript
sonar.scm.disabled=true
```

```
sonar.test.inclusions=tests/*.test.js
sonar.javascript.coveragePlugin=lcov
sonar.javascript.lcov.reportPaths=./coverage/lcov.info
sonar.testExecutionReportPaths=./coverage/test-reporter.xml
sonar.sourceEnconding=UTF-8
```

Step 5: Run the tests

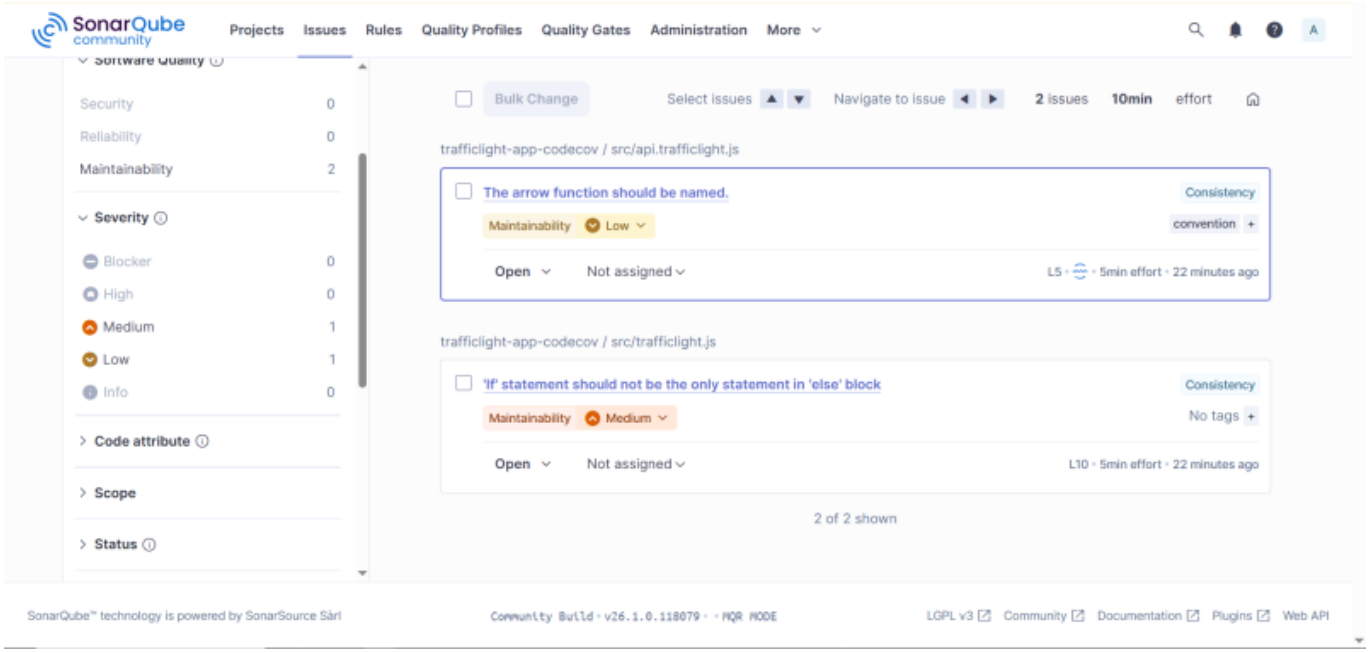
- On Linux: Install jest with `sudo npm i jest-cli -g`
- Run first the code coverage with jest.

```
jest --coverage --coverageDirectory='coverage' --
collectCoverageFrom='src/**/*.js'
```

- Execute the scanner as shown.

```
#!/usr/bin/bash
# Attention:
# Change CRLF (Windows) to LF (Unix on AWS) in your Editor
#
sonar-scanner \
  -Dsonar.projectKey=trafficlight-app-codecov \
  -Dsonar.sources=src \
  -Dsonar.host.url=http://localhost:9000 \
  -Dsonar.token=sqp_6ee5a8843fc36e95825131e03f3ae1ec8d89226d \
  -Dproject.settings=sonar-project.properties
```

- Analyse the generated report in SonarQube



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Based on this Article.