

# Set Up Integration from SonarQube

## SonarQube

### Introduction

SonarQube is a self-hosted or cloud-enabled tool that scans source code to detect bugs, vulnerabilities, code smells, duplications, and coverage issues across 30+ languages. It integrates with build tools (Maven, Gradle, MSBuild) and CI/CD pipelines like Jenkins, GitLab, and GitHub Actions. With IDE plugins for VS Code, IntelliJ, Eclipse, and more, it enforces "Clean as You Code" practices during development. Built for DevSecOps, it can block pull requests or deployments if quality gates are not met.

#### Description:

SonarQube does not natively support direct integration with the Elastic Stack for sending code quality metrics.

However, it can forward **logs**, **metrics**, or even **SonarQube API data** into Elasticsearch using custom setups.

### What It Does:

- Sends SonarQube logs to Elasticsearch for indexing and analysis in Kibana.
- Optionally pushes code quality metrics (bugs, vulnerabilities, coverage, etc.) to Elasticsearch using custom scripts.
- Enables unified observability of code health and platform behavior inside Elastic Stack.

## Option 1: Send Logs to Elastic Using Filebeat

### Description:

Use Filebeat to collect and forward SonarQube logs to Elasticsearch for centralized logging and visualization in Kibana.

### What It Does:

- Automatically ships log files from the SonarQube server to Elasticsearch.
- Allows real-time log monitoring, search, and alerting via Kibana.
- Supports analysis of SonarQube behavior, errors, and performance patterns.

## Steps

### Prepare SonarQube Logs

- **Locate logs (default path: /opt/sonarqube/logs/)**
  - web.log
  - ce.log
  - es.log
  - sonar.log

### Install Filebeat on the SonarQube Host

- **Install Filebeat from**
  - <https://www.elastic.co/docs/reference/beats/filebeat/filebeat-installation-configuration>

### Configure Filebeat to Read SonarQube Logs

- **Edit filebeat.yml configuration file:**

```
filebeat.inputs:
  - type: log
    enabled: true
    paths:
      - /opt/sonarqube/logs/*.log

output.elasticsearch:
  hosts: ["http://<elasticsearch-host>:9200"]
  username: "elastic"
  password: "your-password"
```

- **Start and Enable Filebeat**

```
sudo systemctl enable filebeat
sudo systemctl start filebeat
```

## Option 2: Push Metrics to Elastic via SonarQube API

### Description:

Use SonarQube's built-in Web API to extract code quality metrics and push them into Elasticsearch using a custom script.

### What It Does:

- Retrieves metrics like bugs, vulnerabilities, code smells, and coverage.
- Pushes data to an Elasticsearch index for dashboarding or analysis.
- Enables tracking of project quality trends over time in Kibana.

### Steps:

#### Enable API Access in SonarQube

- **SonarQube provides a built-in Web API at:**
  - `http://<sonarqube-host>/api/measures/component`

- **Use the API to retrieve metrics like:**

```
“ GET
/api/measures/component?component=<project_key>&metricKeys=bugs,vulnerabilities,coverage
```

#### Build a Custom Script (Python Example)

- **Use Python to fetch and send metrics:**

```

import requests, json

sonar_url = "http://<sonarqube>/api/measures/component"
params = {"component": "your_project", "metricKeys":
"bugs,vulnerabilities,code_smells"}

res = requests.get(sonar_url, params=params)
data = res.json()

# Send to Elasticsearch
es_url = "http://<elasticsearch>:9200/sonarqube-metrics/_doc"
requests.post(es_url, headers={"Content-Type": "application/json"},
data=json.dumps(data))

```

## What Happens Next?

Action	Result
SonarQube writes logs	Filebeat ships them to Elasticsearch
Kibana receives log data	Visualize system behavior and performance
Script pulls SonarQube metrics	Elasticsearch stores code health data (via API)
Kibana dashboards can be created	Visualize bugs, vulnerabilities, coverage, etc.

## Requirements

Requirement	Purpose
Filebeat	Forwards log files to Elasticsearch
Elasticsearch	Stores both logs and custom metrics
SonarQube API	Source of code quality data
Custom Script	Pulls metrics and pushes them to Elastic
Cron (optional)	Automates periodic metric synchronization

## Integration Mapping Summary

Component	Function
SonarQube Logs	Shipped to Elasticsearch via Filebeat
Filebeat	Collects and forwards logs
Elasticsearch	Stores logs and metrics
SonarQube API	Retrieves code metrics like bugs, smells, coverage
Custom Script	Pushes metrics to Elasticsearch
Kibana	Visualizes logs and code quality over time

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