

SOFTWARE VERIFICATION #3

3조 송지연, 윤상혁, 장서연



01

TestLink

02

Sonarqube

Sonarqube

연동

plugin 추가

03

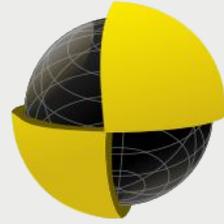
CTIP

CTIP



01

TestLink



TestLink

시스템 테스트 도구

TEST CASE

테스트 관리



요구사항 트래킹



리포팅



TestLink

TestLink

| 프로젝트 생성

테스트를 실행하기 위한 프로젝트 생성

The screenshot shows the TestLink 1.9.17 web interface in a browser window. The browser tabs include JenkinsTest, Team_Organization, Is SonarQube Replacement, TestLink Tutorial: A Comple, 소검_3T - Google 드라이브, Download Bitnami TestLink, and TestLink 1.9.17 (Alan Turing). The address bar shows the URL 127.0.0.1:81/testlink/index.php?caller=login&viewer=.

The main content area is titled "Test Project Management : Create a new project". It contains a form with the following fields and options:

- Name ***: A text input field.
- Prefix (used for Test case ID) ***: A text input field.
- Project description**: A rich text editor with a toolbar containing options like Source, Bold, Italic, Underline, and others.
- Enhanced features**: A list of checkboxes:
 - Enable Requirements feature
 - Enable Testing Priority
 - Enable Test Automation (API keys)
 - Enable Inventory
- Issue Tracker Integration**: A section with the text ">> There are no Issue Tracker Systems defined <<".
- Code Tracker Integration**: A section with the text ">> There are no Code Tracker Systems defined <<".
- Availability**: A list of checkboxes:
 - Active
 - Public

At the bottom of the form, there are "Create" and "Cancel" buttons. Below the form, there is a note: "* Mandatory fields".



TestLink

TestLink

| 프로젝트 생성

테스트를 실행하기 위한 프로젝트 생성

The screenshot shows the TestLink 1.9.17 web interface. The browser address bar shows the URL `127.0.0.1:81/testlink/index.php`. The user is logged in as `nyoonsh97 [admin]`. The page title is `TestLink 1.9.17 (Alan Turing)`. The breadcrumb navigation shows `Test Project | Test -->`. The main content area is divided into several sections:

- Define Custom Fields**
 - Issue Tracker Management
 - Code Tracker Management
- Test Project Management**
 - Assign User Roles
 - Assign Custom Fields
 - Keyword Management
 - Platform Management
 - Inventory management
- Requirement Specification**
 - Requirement Overview
 - Generate Requirement Specification Document
 - Search Requirements
 - Search Requirement Specifications
 - Assign Requirements
 - Requirement Monitoring Overview
- Test Specification**
 - Test Cases created per User

On the right side, there is a **Current Test Plan:** dropdown menu set to `Test Plan` with an `OK` button. Below it, the **Test Plan Management** section is highlighted with a red box, containing **Builds / Releases** and **Milestone Overview**. Other sections include **Execute Tests** (Test Cases Assigned to Me, Test Reports and Metrics, Metrics Dashboard) and **Add / Remove Platforms** (Add / Remove Test Cases, Assign Test Case Execution, Set Urgent Tests, Update Linked Test Case Versions, Show Test Cases Newest Versions).

Build management - Test Plan : Test Plan

Create a new Build

Title	<input type="text" value="Test - Build"/>
Description	<div><p>Source                                   </p></div>

| Test Suite 생성

Test Case의 집합인 Test Suite 생성

Define Custom Fields

Issue Tracker Management

Code Tracker Management

Test Project Management

Assign User Roles

Assign Custom Fields

Keyword Management

Platform Management

Inventory management

Requirement Specification

Requirement Overview

Generate Requirement
Specification Document

Search Requirements

Search Requirement Specifications

Assign Requirements

Requirement Monitoring Overview

Test Specification

Search Test Cases

Test Cases created per User

Navigator - Test Specification

Settings  

Update tree after every operation

Filters 

Test Case ID

Test Case Title

Test Suite

Status

Importance

Execution type

▶  Test (1)

Test Project : Test

Test Suite Operations     

Test Project Name

Test

Description

First project for test

Attached files :

File  선택한 파일이 없습니다. Title/name:

Navigator - Test Specification

Settings

Update tree after every operation

Filters

Test Case ID:

Test Case Title:

Test Suite:

Status:

Importance:

Execution type:

- Test (1)
 - Test - Test suite Name (1)

Test Suite : Test - Test suite Name

Test Suite Operations

Test Case Operations:

Test Suite : Test - Test suite Name

Details

Test suit case

Keywords : None

Attached files :

File 선택한 파일이 없습니다. **Title/name:**



TestLink

TestLink

| Test Case 생성

Test Case를 생성

The screenshot shows the TestLink 1.9.17 web interface for creating a test case. The browser window title is "TestLink 1.9.17 (Alan Turing)". The URL is "127.0.0.1:81/testlink/index.php". The user is logged in as "nyoonsh97 [admin]".

The interface is divided into two main sections:

- Navigator - Test Specification:** This sidebar on the left contains a "Settings" section with a checked "Update tree after every operation" option. Below it are "Filters" for Test Case ID, Title, Suite, Status, Importance, and Execution type. At the bottom, there are "Expand tree" and "Collapse tree" buttons, and a tree view showing "Test (0)" and "Test - Test suite Name (0)".
- Test Suite : Test - Test suite Name - Create Test Case:** This main area contains:
 - Buttons for "Create" and "Cancel", and a checkbox "check to create another test case after saving".
 - A "Test Case Title" input field.
 - A "Summary" section with a rich text editor containing the text "summary".
 - A "Preconditions" section with a rich text editor containing a numbered list: "1. Hello", "2. World!".
 - Metadata fields: "Status" (Draft), "Importance" (Medium), "Execution type" (Manual), and "Estimated exec. duration (min)".
 - A "Keywords" section with "Available Keywords" and "Assigned Keywords" lists.

Navigator - Test Specification

Settings

Update tree after every operation

Filters

Test Case ID:

Test Case Title:

Test Suite:

Status:

Importance:

Execution type:

- Test (1)
 - Test - Test suite Name (1)
 - Test --1: Test Case Title**

Test Case

Warning! This Test Case version has been executed.

Test --1 : Test Case Title - Version1  

Summary

summary

Preconditions

- Hello
- World!

	Step actions	Expected Results	Execution
1	Click button	Pop up	Manual  

Status : Importance : Execution type : Apply To All Steps

Estimated exec. (min) :

Keywords: None

Requirements  :  [Test - test] 456 : Test



TestLink

TestLink

| Test Case 생성

Test Case를 생성

The screenshot shows the TestLink 1.9.17 web interface. The browser address bar shows the URL `127.0.0.1:81/testlink/index.php`. The user is logged in as `nyoonsh97 [admin]`. The page title is `TestLink 1.9.17 (Alan Turing)`. The breadcrumb trail is `Test Project > Test -- > Test`.

The interface is divided into several sections:

- Navigator - Test Specification:** Contains settings for the test specification, including a checkbox for "Update tree after every operation" and a "Filters" section with fields for Test Case ID, Test Case Title, Test Suite, Status, Importance, and Execution type.
- Create Step - Test Case: Test -- 1: Test Case Title - Version: 1:** The main form for creating a test step. It includes a "Summary" section with a "summary" field, a "Preconditions" section with a list of conditions (e.g., "1. Hello", "2. World!"), and a "Step actions" table.

#	Step actions	Expected Results	Execution
1	Click button body p	Pop up body p	Manual

Navigator - Test Specification

Settings

Update tree after every operation

Filters

Test Case ID:

Test Case Title:

Test Suite:

Status:

Importance:

Execution type:

- Test (1)
 - Test - Test suite Name (1)
 - Test --1:Test Case Title

Test Case

Warning! This Test Case version has been executed.

Test --1 : Test Case Title - Version1  

Summary

summary

Preconditions

- Hello
- World!

	Step actions	Expected Results	Execution
1	Click button	Pop up	Manual  

Status : Importance : Execution type : Apply To All Steps

Estimated exec. (min) :

Keywords: None

Requirements  :  [Test - test] 456 : Test

| Requirements 생성

Requirements를 생성

Define Custom Fields
Issue Tracker Management
Code Tracker Management

Test Project Management
Assign User Roles
Assign Custom Fields
Keyword Management
Platform Management
Inventory management

Requirement Specification

Requirement Overview

Generate Requirement
Specification Document

Search Requirements

Search Requirement Specifications

Assign Requirements

Requirement Monitoring Overview

Test Specification

Search Test Cases

Test Cases created per User

Navigator - Requirement Specifications

Settings
Update tree after every operation

Filters

Document ID

Title

Status

Requirement Type

Req. Spec. Type

Expected no. of testcases

Has relation of type

Test Case ID

Apply Reset Filters Advanced Filters

Expand tree Collapse tree

Test (1)
1234: Test - test (1)
456: Test

Requirement : Test

456: Test

Version 1 revision 1

Status : Draft
Type : Use Case
Number of test cases needed : 1

Scope

des

Coverage

Test --1 : Test Case Title

Created on 04/15/2018 01:57:23 by nyoosh97

Relations

New relation: Current requirement related to Requirement Document ID Add

Monitors

Loading...

Showing 0 to 0 of 0 entries

Attached files :

File 선택한 파일이 없습니다. Title/name: Upload file

| Requirements 와 Test Case assign

Requirements와 Test Case를 매칭

Define Custom Fields
Issue Tracker Management
Code Tracker Management

Test Project Management
Assign User Roles
Assign Custom Fields
Keyword Management
Platform Management
Inventory management

Requirement Specification
Requirement Overview
Generate Requirement Specification Document
Search Requirements
Search Requirement Specifications
Assign Requirements
Requirement Monitoring Overview

Test Specification
Search Test Cases
Test Cases created per User

Navigator - Test Specification

Settings [?](#)

Update tree after every operation

Filters

Test Case ID

Test Case Title

Test Suite

Status

Importance

Execution type

[Apply](#) [Reset Filters](#)

[Expand tree](#) [Collapse tree](#)

- Test (1)
 - Test - Test suite Name (1)
 - Test --1: Test Case Title

Test Case : Test Case Title [?](#)

Assign Requirements to Test Case

Requirements Specification Document

Assigned Requirements

<input checked="" type="checkbox"/>	Document ID	Requirement	Scope	Assigned by	Timestamp
<input type="checkbox"/>	456	Test	des	nyoonsh97	04/15/2018 01:58:06

[Unassign](#)

Available Requirements

<input checked="" type="checkbox"/>	Document ID	Requirement	Scope
No requirement			

[Assign](#)



TestLink

TestLink

| Execute Tests

Test를 수행 결과를 기록

Test Plan Management

Builds / Releases

Milestone Overview

Execute Tests

Test Cases Assigned to Me

Test Reports and Metrics

Metrics Dashboard

Add / Remove Platforms

Add / Remove Test Cases

Assign Test Case Execution

Set Urgent Tests

Update Linked Test Case Versions

Show Test Cases Newest Versions

| Execute Tests

Test를 수행 결과를 기록

Execute Tests

Settings

Test Plan:

Build to execute:

Update tree after every operation:

Filters

Test Case ID:

Test Case Title:

Test Suite:

Priority:

Execution type:

Assigned to:

include unassigned Test Cases

Bugs on Exec. Context:

Result:

on:

- Test / Test Plan (1)(0, 1, 0, 0)
 - Test - Test suite Name (1)(0, 1, 0, 0)
 - Test --1:Test Case Title

#	Step actions	Expected Results	Execution	Execution notes	Execution Status
1	Click button	Pop up	Manual		<div style="border: 2px solid red; padding: 5px;"> <input type="text" value=""/> <ul style="list-style-type: none"> Passed Failed Blocked </div>

File  선택한 파일이 없습니다.

Execution type : Manual
Estimated exec. duration (min) :

Requirements

[Test - test] 456 : Test

Notes / Description

Execution duration (min)





Important Notice: Once a Result is updated from 'Not Run' to another value, you cannot set it back to 'Not Run'. You can still set the Result to any other value.

| Execute Tests

Test를 수행 결과

Last execution (any build)

Date : 04/15/2018 04:05:10 - Tested by : nyoosh97 - Build : Test - Build - Status : Passed

Last execution (current build) - Build : Test - Build

Date	Build	Tested by	Status	Exec (min)	Version	Run mode
 04/15/2018 04:05:10	Test - Build	nyoosh97	Passed		1	   

[Test Plan Management](#)[Builds / Releases](#)[Milestone Overview](#)[Execute Tests](#)[Test Cases Assigned to Me](#)[Test Reports and Metrics](#)[Metrics Dashboard](#)[Add / Remove Platforms](#)[Add / Remove Test Cases](#)[Assign Test Case Execution](#)[Set Urgent Tests](#)[Update Linked Test Case Versions](#)[Show Test Cases Newest Versions](#)

| Test Reports and Metrics

Test를 수행 결과를 엑셀 파일화

Reports and Metrics

Report Format

Test Plan

Show inactive test plans

[Test Plan Report](#)

[Test Report](#)

[Test Report on build](#)

[General Test Plan Metrics](#)

[Results by Tester per Build](#)

[Test Case Assignment Overview](#)

[Test result matrix](#)

[Test Results Flat](#)

[Failed Test Cases](#)

[Blocked Test Cases](#)

[Not run Test Cases](#)

[Test Cases without Tester Assignment](#)

[Charts](#)

[Requirements based Report](#)

[Test Cases with Custom Fields set on Execution](#)

[Test Plan with Custom Field info](#)

[Test Cases not assigned to Any Test Plan](#)



TestLink

TestLink

| Test Reports and Metrics

Test를 수행 결과를 엑셀 파일화

resultsTCFlat_Test Plan-1 - 제한된 보기 - Excel

제한된 보기 주의하세요—인터넷에서 가져온 파일에는 바이러스가 있을 수 있습니다. 편집하지 않는다면 제한된 보기에서 여는 것이 안전합니다. 편집 사용(E)

Execution type

Test Suite	Test Case	Version	Priority	Build	Assigned	Latest Exe Date	Tested by/Notes	Execution	Execution type
Test - Test	Test --1:Te	1	Medium	Test - Build	Passed	2018-04-1	SangHyeukYoon Administrator Manual		

Worksheet

준비

100%



02

SonarQube

SonarQube

연동

plugin 추가

Static Analysis

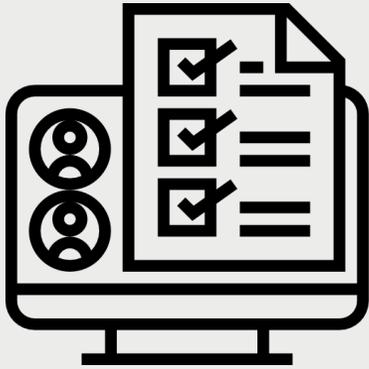
정적 분석이란?

- ▶ 실행 없이
- ▶ 코드 또는 목적 프로그램
- ▶ 자동화된 툴을 이용하여 분석 가능

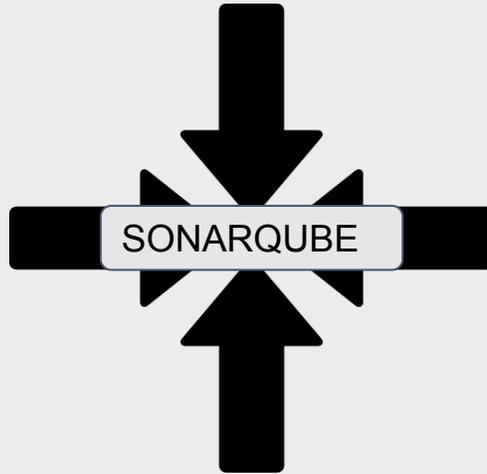
02

sonarqube

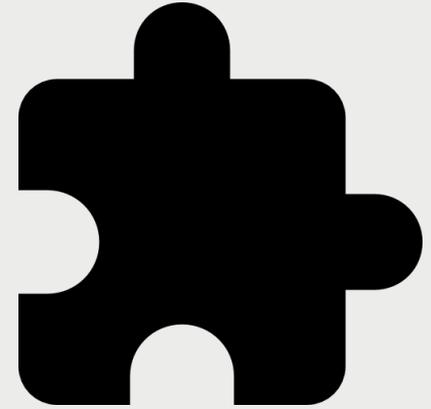
sonarqube



▶ 웹페이지를 통해 쉽게 확인 가능



▶ 여러 분석 툴을 통합하여 한 번에 검사 가능



▶ 다양한 플러그인 제공

02

sonarqube

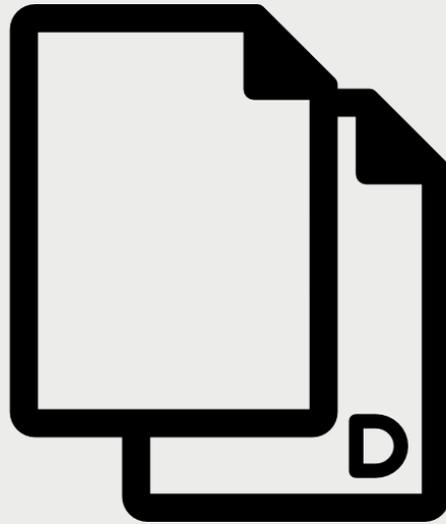
sonarqube

연동

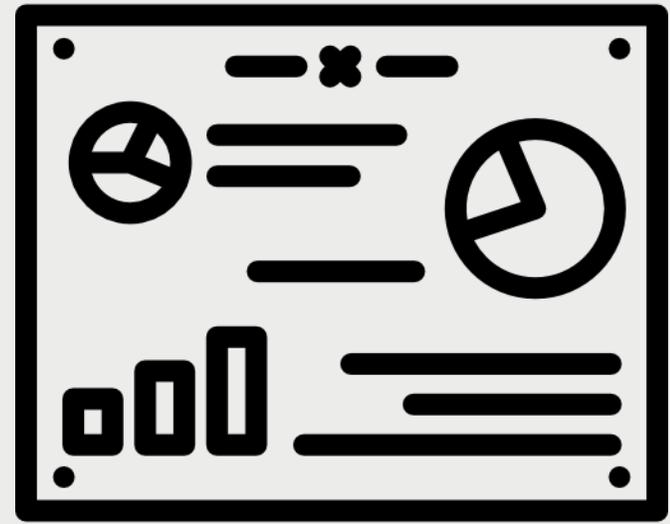
plugin 추가



▶ 잠재 버그 파악



▶ 코드의 중복 검사



▶ 대시보드를 통해 한 눈에 파악 가능

Execute the SonarQube Scanner for Gradle from your computer

Running a SonarQube analysis with Gradle is straightforward. You just need to declare the `org.sonarqube` plugin in your `build.gradle` file:

```
plugins {  
    id "org.sonarqube" version "2.5"  
}
```

[Copy](#)

and run the following command:

```
./gradlew sonarqube \  
-Dsonar.host.url=http://localhost:9000 \  
-Dsonar.login=c51c36f9f5f099905c4fc63804402f56352569b1
```

[Copy](#)

Please visit the [official documentation of the SonarQube Scanner for Gradle](#) for more details.

Once the analysis is completed, you will be able to browse your project at the URL displayed at the end of the logs.



sonarqube

sonarqube

연동

plugin 추가

sonarqube Projects Issues Rules Quality Profiles Quality Gates Administration ? A

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.

Name	Created	
Jenkins	April 15, 2018	Revoke

Generate New Token: [Generate](#)

02

sonarqube

sonarqube

연동

plugin 추가

▶ gradle을 이용하여 연동

▶ build.gradle 에 plugin 추가

▶ plugins {

 id "org.sonarqube" version 2.6.1

}

02

sonarqube

sonarqube

연동

plugin 추가

▶ gradle을 이용하여 빌드

▶ gradlew.bat sonarqube

-Dsonar.host.url={sonarqube 주소}

-Dsonar.organization={Token 이름}

-Dsonar.login={Token 번호}

Build

Execute Windows batch command

Command

```
cd JenkinsTest
gradlew.bat sonarqube
-Dsonar.host.url=https://http://192.168.0.7:9000/projects
-Dsonar.organization=Jenkins
-Dsonar.login=f7b169931550af393c2c4abb64228a182304220f
```

See [the list of available environment variables](#)

고급...

Add build step ▼



sonarqube

sonarqube

연동

plugin 추가

sonarqube **Projects** Issues Rules Quality Profiles Quality Gates Administration

Search for projects, sub-projects and files... ? A

My Favorites All

Perspective: Overall Status Sort by: Name Search by project name or key 1 projects

☆ **JenkinsTest** Passed Last analysis: April 15, 2018, 3:29 PM

0 A Bugs	0 A Vulnerabilities	0 A Code Smells	0.0% Coverage	0.0% Duplications	31 XS Java
--------------------	-------------------------------	---------------------------	------------------	----------------------	----------------------

1 of 1 shown

Filters

Quality Gate

Passed	1
Warning	0
Failed	0

Reliability (Bugs)

A	1
B and worse	0
C and worse	0
D and worse	0
E	0

Security (Vulnerabilities)

A	1
B and worse	0



sonarqube

sonarqube

연동

plugin 추가

sonarqube Projects Issues Rules Quality Profiles Quality Gates Administration ? A

Administration
 Configuration ▾ Security ▾ Projects ▾ System Marketplace

Marketplace
 Discover and install new features

Community Edition ✔ Installed

Comes with support for 9 programming languages, numerous plugins, integration with DevOps tool chains, and ability to connect to SonarLint in the IDE.

[Learn more](#)

Developer Edition

Community Edition + branch analysis, SonarLint push notifications, and 16 languages.

[Learn more](#) Upgrade

Enterprise Edition

Developer Edition + portfolio management, executive reporting, parallel processing of analysis reports and 20 languages.

[Learn more](#) Upgrade

Data Center Edition

Enterprise Edition + component redundancy and data integrity.

[Learn more](#) Upgrade

All Updates Only

<p>3D Code Metrics Governance</p> <p>Displays 3D view of your source code as a city</p>	<p>3.6.2 Internal bugfix release ***</p>	<p>Homepage Issue Tracker</p> <p>Licensed under Commercial</p> <p>Developed by excentia</p>	<p><input type="checkbox"/> I accept the Terms and Conditions</p> <p style="text-align: right;">Install</p>
<p>AEM Rules for SonarQube External Analysers</p> <p>Adds rules for AEM Java development</p>	<p>0.9 Compatibility with SonarJava 4.10 ***</p> <p>Installing this plugin will also install: SonarJava</p>	<p>Homepage Issue Tracker</p> <p>Licensed under The Apache Software Licen...</p> <p>Developed by Cognifide Limited</p>	<p style="text-align: right;">Install</p>
<p>Android External Analysers</p> <p>Provide the ability to import Android Lint reports</p>	<p>1.1 This plugin has been renamed "Android Lint" to prevent any misunderstanding about its purpose: an Android project can be analysed with the standard SonarQube Java plugin and this plugin just allows to import Android Lint reports if needed. This new version provides a default sqale mapping for the Android Lint rules and the ability to automatically execute lint has been dropped. ***</p> <p>Installing this plugin will also install: SonarJava</p>	<p>Homepage Issue Tracker</p> <p>Licensed under GNU LGPL 3</p> <p>Developed by SonarSource and Jerome Van Der Linden, Stephane Nicolas, Florian Roncari, Thomas Bores</p>	<p style="text-align: right;">Install</p>

02

sonarqube

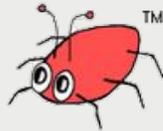
sonarqube

연동

plugin 추가



- Defect를 유발할 수 있는 코드를 검사
- 중복된 코드 검출
- <https://pmd.github.io>



- 100여개의 잠재적인 에러 타입 탐색
- scariest, scary, troubling, concern 4단계의 rank 판정
- <http://findbugs.sourceforge.net>



- Coding Rule을 따르고 있는지 확인. 보통 Google's Style과 Unix Style
- 조직만의 Coding Rule을 정의하고 점검할 수 있음
- <http://checkstyle.sourceforge.net>

Quality Profiles

Quality Profiles are collections of rules to apply during an analysis.

For each language there is a default profile. All projects not explicitly assigned to some other profile will be analyzed with the default.



All Profiles ▾

Language	Profiles	Projects	Rules	Updated	Used
C#	1 profile(s)				
Sonar way	Built-in	Default	186	Never	Never
Flex	1 profile(s)				
Sonar way	Built-in	Default	60	Never	Never
Java	6 profile(s)				
FindBugs	Built-in	0	452	Never	Never
FindBugs + FB-Contrib	Built-in	0	735	Never	Never
FindBugs Security Audit	Built-in	0	112	Never	Never
FindBugs Security Minimal	Built-in	0	83	Never	Never
Sonar way	Built-in	Default	299	Never	yesterday

Recently Added Rules

Nullness of parameters should be guaranteed
Java, activated on 1 profile(s)

"this" should not be exposed from constructors
Java, not yet activated

"equals" method parameters should not be marke...
Java, activated on 1 profile(s)

Unary prefix operators should not be repeated
Java, activated on 1 profile(s)

"switch" statements should not be nested
Java, not yet activated

"if ... else if" constructs should end with "else" claus...
Java, not yet activated

"SecureRandom" seeds should not be predictable
Java, activated on 1 profile(s)

"write(byte[],int,int)" should be overridden
Java, activated on 1 profile(s)

"iterator" should not return "this"
Java, activated on 1 profile(s)

"compareTo" should not be overloaded
Java, activated on 1 profile(s)

See All 2.8k

New Profile

Name*

Language*

PMD 선택한 파일이 없습니다.
Optional configuration file

FindBugs 선택한 파일이 없습니다.
Optional configuration file

Checkstyle 선택한 파일이 없습니다.
Optional configuration file

02

sonarqube

sonarqube

연동

plugin 추가

The screenshot shows the SonarQube interface for configuring rules. On the left, a sidebar contains filter sections: Language (Java selected), Type (Bug, Vulnerability, Code Smell), Tag, Repository, Default Severity, Status, Available Since, Template, Quality Profile (FindBugs Java variants and Test Java selected), and Inheritance. The main content area shows a table with one rule: 'Check ResultSet' for Java Code Smell. A red box highlights the 'Test Java' quality profile in the sidebar. At the bottom, a red banner contains the following text:

Embedded database should be used for evaluation purpose only
The embedded database will not scale, it will not support upgrading to newer versions of SonarQube, and there is no support for migrating your data out of it into a different database engine.



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연동

plugin 추가

Quality Profiles

Choose which profile is associated with this project on a language-by-language basis. (Note that you will only need to select profiles for multiple languages for multi-language projects.)

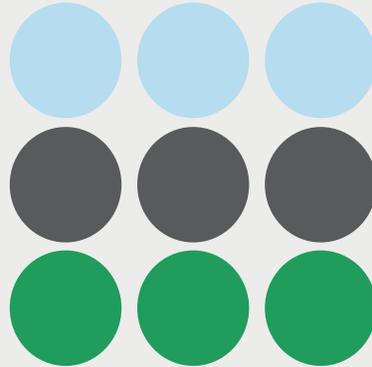
Language	Quality Profile
C#	Default: Sonar way ▾
Flex	Default: Sonar way ▾
JSP	Default: FindBugs Security JSP ▾
Java	Test ▾
JavaScript	FindBugs FindBugs + FB-Contrib FindBugs Security Audit FindBugs Security Minimal
PHP	Default: Sonar way
Python	Test
TypeScript	Default: Sonar way ▾
XML	Default: Sonar way ▾



03

CTIP





THANK YOU

SOFTWARE VERIFICATION