

# SonarQube

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1. 도구 개요

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2. 설치 및 실행

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3. 주요 기능

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4. 활용 예제

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# 1. 도구 개요

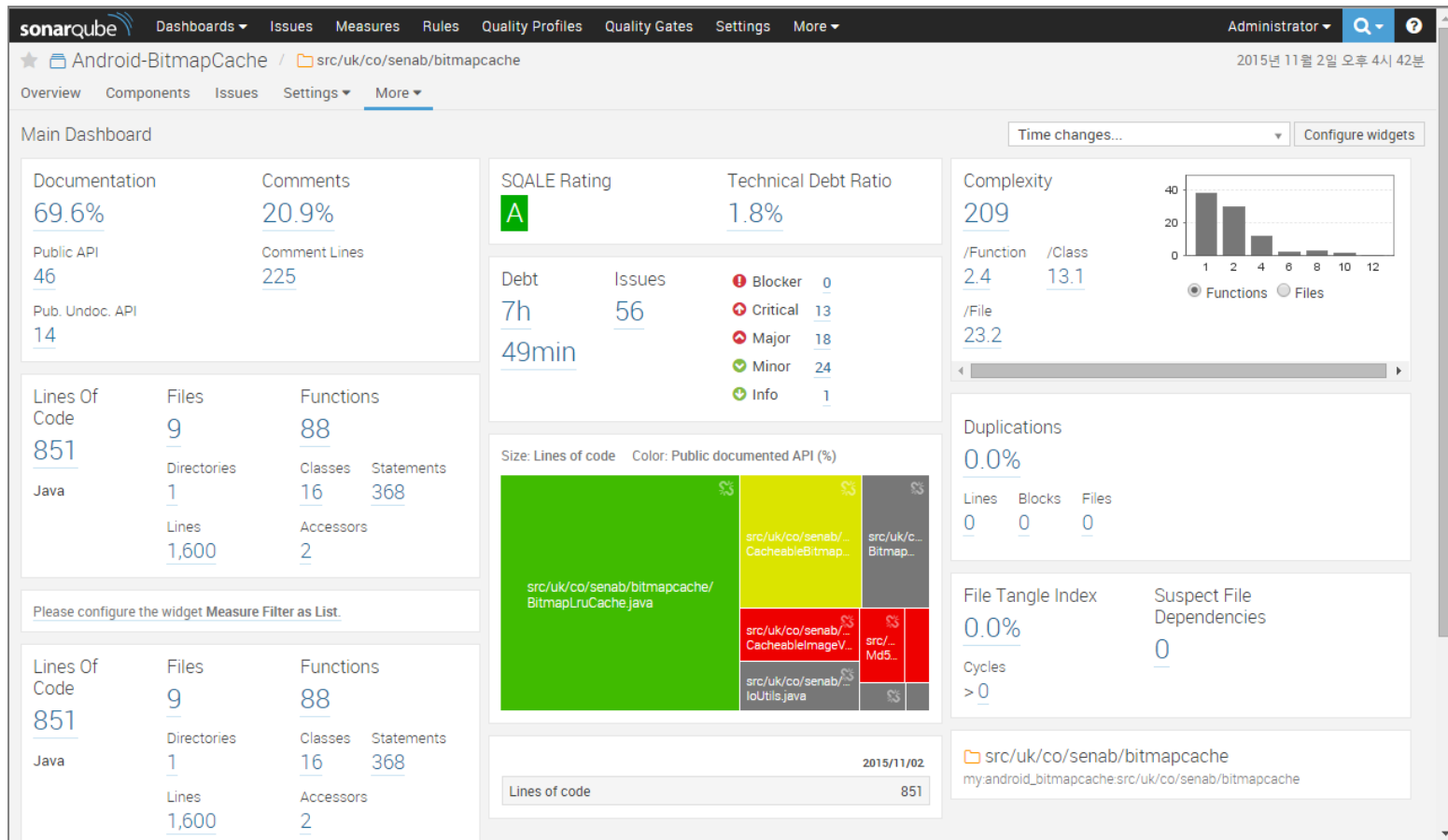
## 1.1 도구 정보 요약

|      |                                                                                                                                                                                          |        |                   |                   |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-------------------|-------------------|
| 도구명  | SonarQube<br>(http://www.sonarqube.org/)                                                                                                                                                 |        | 라이선스              | GNU Lesser GPL v3 |
| 소개   | • SonarQube는 Java 기반의 정적분석 도구로써, 다양한 품질 항목들에 대해서 분석하여 사용자에게 결과를 제공함                                                                                                                      |        |                   |                   |
| 특징   | • 여러 분석 툴을 통합하여 여러 항목들을 한번에 검사 가능<br>• 웹 페이지에서 분석 결과들을 손쉽게 확인 가능<br>• 플러그인을 이용하여 다양한 기능 제공                                                                                               |        |                   |                   |
| 주요기능 | • 코드 품질 대쉬보드<br>• 코드 중복, 코딩 표준, 커버리지 부족, 잠재 버그, 복잡도, 문서화, 설계에 대한 품질 척도 표시<br>• Java, C#, C/C++, JavaScript, PHP 등 20여가지 언어 지원<br>• CI(Continuous Integration) 도구와 통합<br>• 60여가지의 플러그인 제공 |        |                   |                   |
| 실행환경 | • Windows, Linux, MacOS                                                                                                                                                                  | 사전설치도구 | • JDK 1.6+        |                   |
| 카테고리 | • 품질관리                                                                                                                                                                                   | 최신버전   | • v5.1.2 (2015.7) |                   |
| 관련도구 | • CheckStyle, PMD, Splint                                                                                                                                                                |        |                   |                   |

# 1. 도구 개요

## 1.2 스크린 캡처 및 주요 기능

- SQALE(Software Quality Assessment based on Lifecycle Expectations) 등급 및 기술적 부채 비율 표시
- 품질 지표를 한 눈에 볼 수 있는 SW Visualization 대시보드 제공



## 2. 설치 및 실행

### 세부 목차

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2.1 JDK 설치 하기

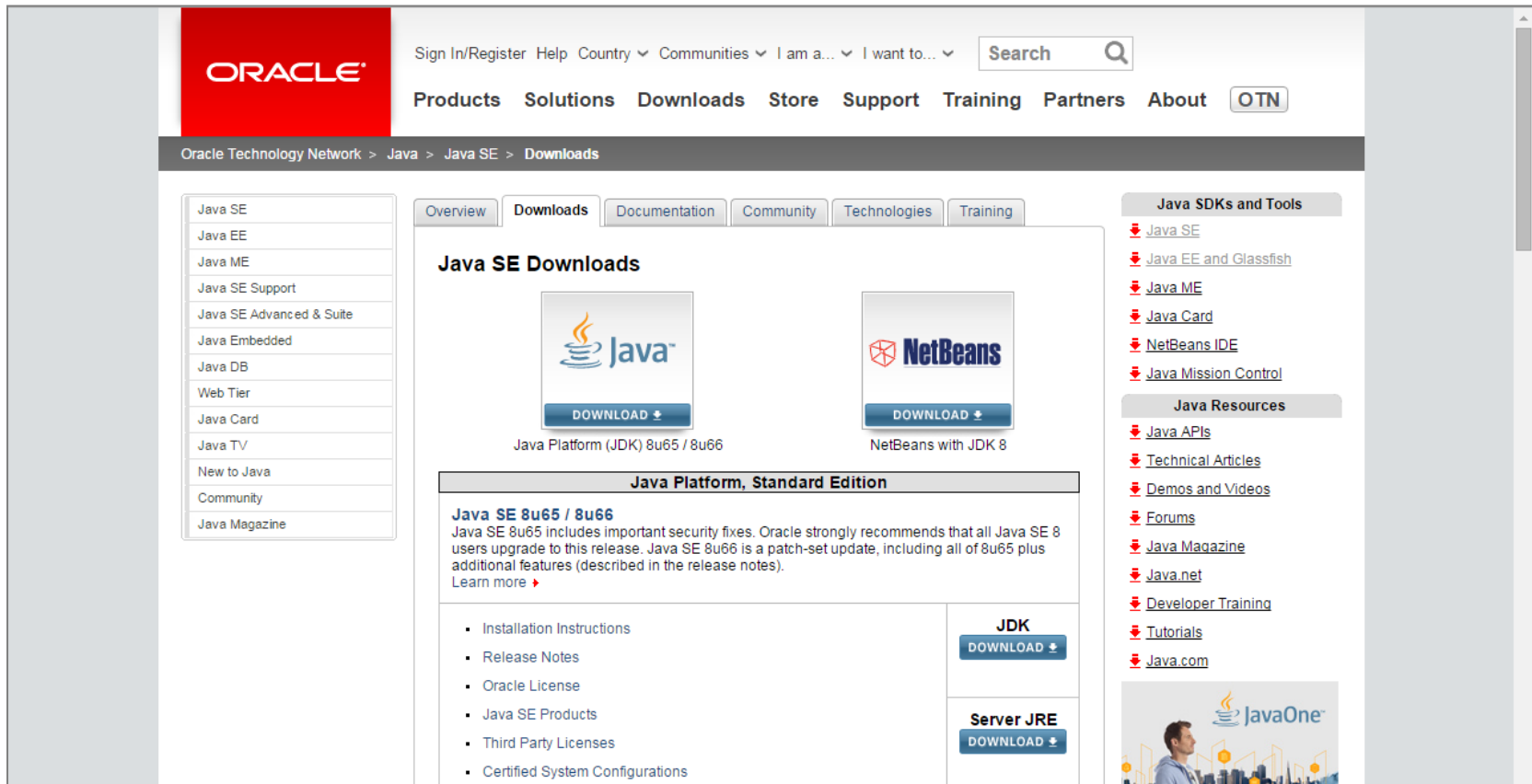
2.2 SonarQube 설치 하기

2.3 SonarQube Runner 설치 하기

## 2. 설치 및 실행

### 2.1 JDK 설치하기 (1/2)

- 다음의 사이트에서 JDK 다운
  - <http://www.oracle.com/technetwork/java/javase/downloads/index.htm>
  - JDK Download를 클릭하여 자신의 운영체제에 맞는 버전을 다운받고 설치

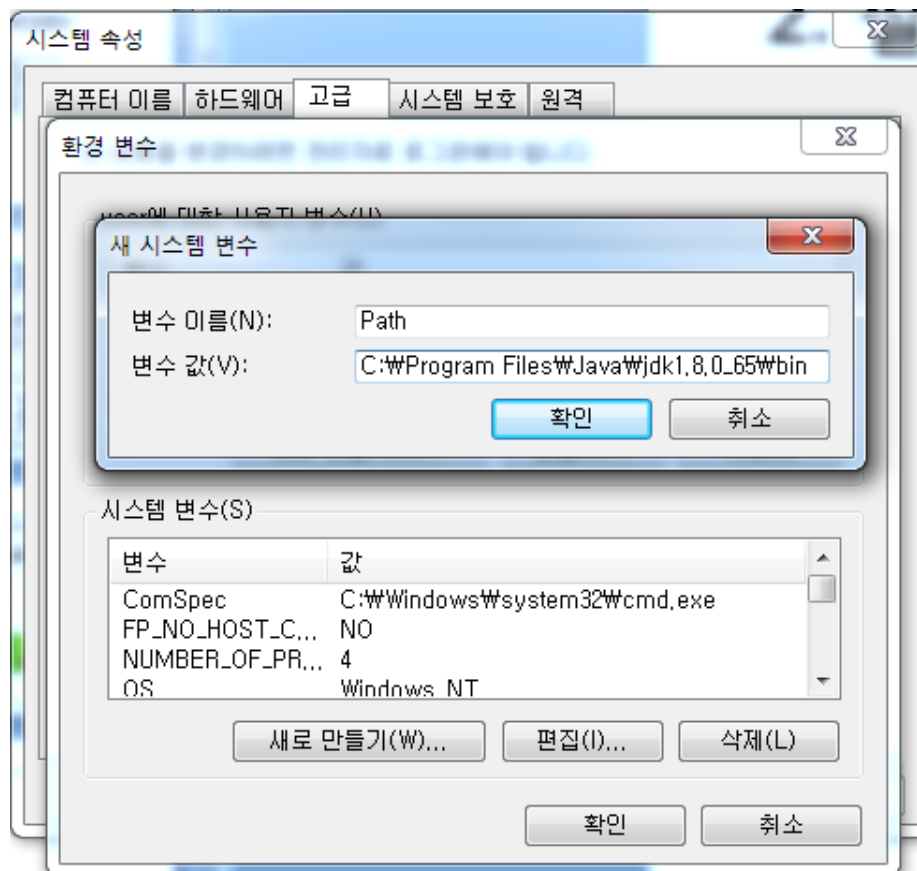


The screenshot shows the Oracle Java SE Downloads page. The top navigation bar includes the Oracle logo, a search bar, and links for Sign In/Register, Help, Country, Communities, I am a..., I want to..., Products, Solutions, Downloads, Store, Support, Training, Partners, About, and OTN. The breadcrumb trail reads: Oracle Technology Network > Java > Java SE > Downloads. The left sidebar contains a list of links: Java SE, Java EE, Java ME, Java SE Support, Java SE Advanced & Suite, Java Embedded, Java DB, Web Tier, Java Card, Java TV, New to Java, Community, and Java Magazine. The main content area is titled 'Java SE Downloads' and features two large download buttons: 'Java Platform (JDK) 8u65 / 8u66' and 'NetBeans with JDK 8'. Below these, the 'Java Platform, Standard Edition' section provides details about Java SE 8u65 / 8u66, including a list of links: Installation Instructions, Release Notes, Oracle License, Java SE Products, Third Party Licenses, and Certified System Configurations. On the right, there are two more download buttons: 'JDK' and 'Server JRE'. The right sidebar contains links for Java SDKs and Tools (Java SE, Java EE and Glassfish, Java ME, Java Card, NetBeans IDE, Java Mission Control) and Java Resources (Java APIs, Technical Articles, Demos and Videos, Forums, Java Magazine, Java.net, Developer Training, Tutorials, Java.com). At the bottom right, there is a JavaOne logo and a small image of a person.

## 2. 설치 및 실행

### 2.1 JDK 설치하기 (2/2)

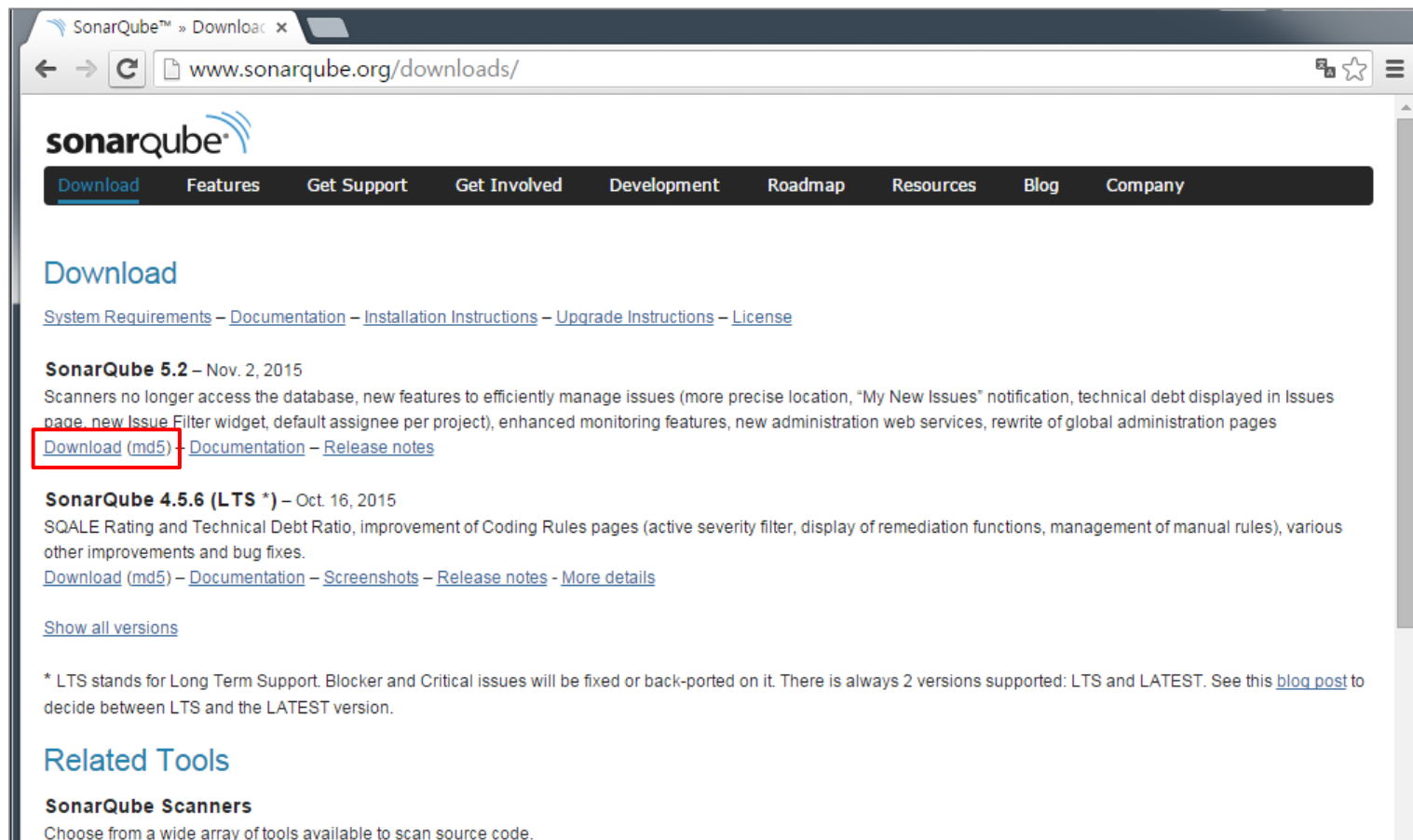
- 다음과 같이 환경변수를 등록함
  - 시스템 속성 → 고급 → 환경 변수 → 시스템 변수
    - > Path 항목의 맨 뒤에 JDK가 설치된 폴더의 bin 폴더를 추가 함
    - > 본 예제에서는 C:\Program Files\Java\jdk1.8.0\_65\bin 위치 추가



## 2. 설치 및 실행

### 2.3 SonarQube 설치 하기 (1/6)

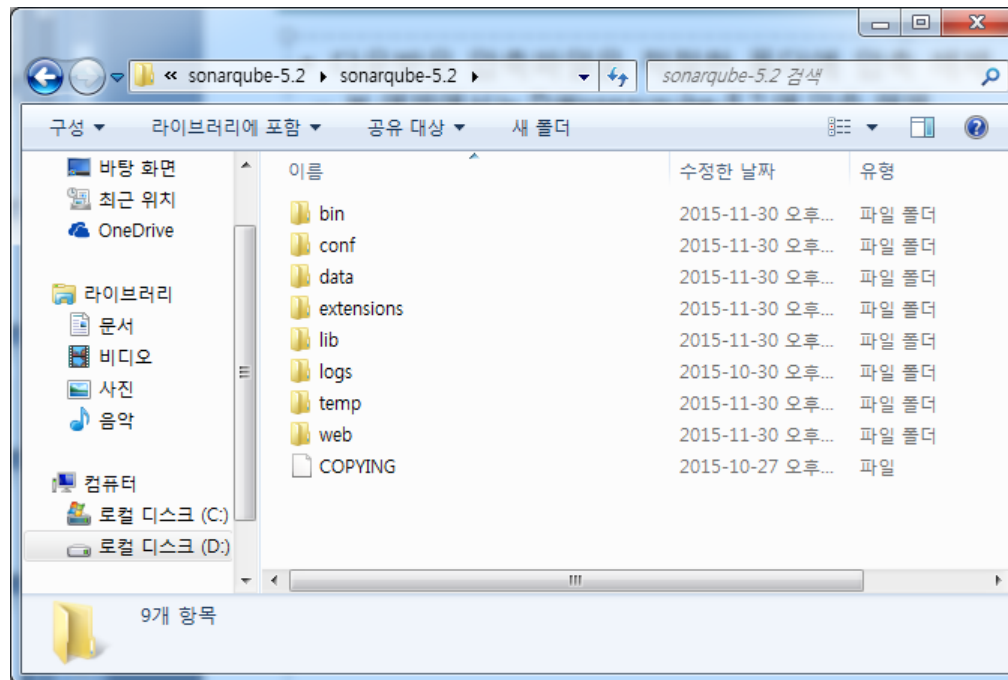
- SonarQube 다운로드
  - <http://www.sonarqube.org/downloads/>
  - > SonarQube는 압축 해제로 설치가 완료된다. 최신 버전의 SonarQube 다운



## 2. 설치 및 실행

### 2.3 SonarQube 설치 하기 (2/6)

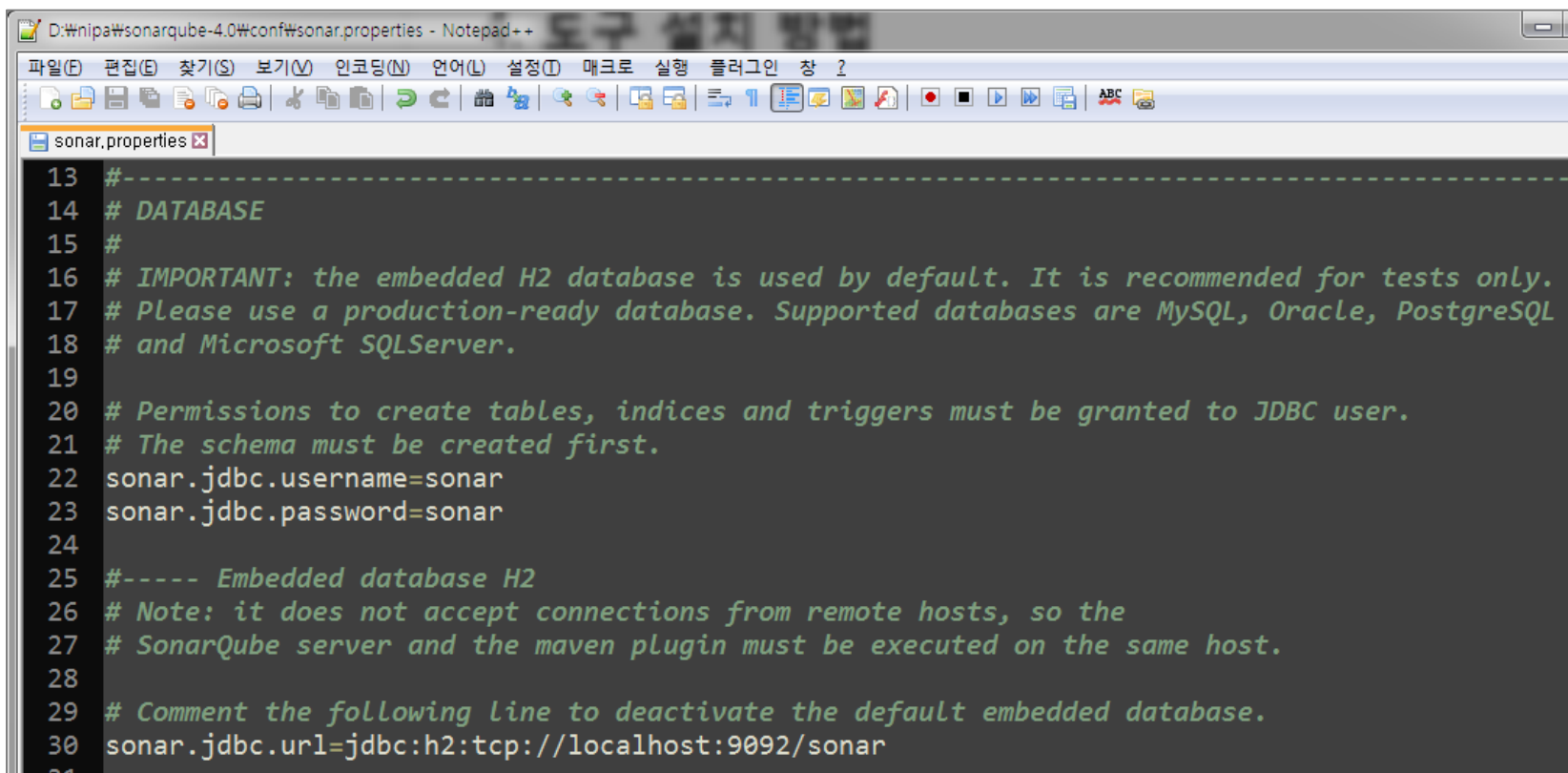
- 다운받은 압축파일을 적절한 폴더에 압축 해제
  - 본 예제에서는 D:\sonarqube-5.2 에 압축 해제
  - 이후 D:\sonarqube-5.2 를 <sonarqube\_home> 이라고 지칭



## 2. 설치 및 실행

### 2.3 SonarQube 설치 하기 (3/6)

- DB 접속 설정
  - DB 접속 정보는 <sonarqube\_home>/conf/sonar.properties 파일에서 관리
    - > 내장 DB를 사용하는 경우 수정할 필요 없음
    - > 여기서는 내장 DB를 사용



```
D:\nipa\sonarqube-4.0\conf\sonar.properties - Notepad++
파일(F) 편집(E) 찾기(S) 보기(V) 인코딩(N) 언어(L) 설정(I) 매크로 실행 플러그인 창 ?
sonar.properties
13 #-----
14 # DATABASE
15 #
16 # IMPORTANT: the embedded H2 database is used by default. It is recommended for tests only.
17 # Please use a production-ready database. Supported databases are MySQL, Oracle, PostgreSQL
18 # and Microsoft SQLServer.
19
20 # Permissions to create tables, indices and triggers must be granted to JDBC user.
21 # The schema must be created first.
22 sonar.jdbc.username=sonar
23 sonar.jdbc.password=sonar
24
25 #----- Embedded database H2
26 # Note: it does not accept connections from remote hosts, so the
27 # SonarQube server and the maven plugin must be executed on the same host.
28
29 # Comment the following line to deactivate the default embedded database.
30 sonar.jdbc.url=jdbc:h2:tcp://localhost:9092/sonar
31
```

## 2. 설치 및 실행

### 2.3 SonarQube 설치 하기 (4/6)

- Web Server 설정
  - <sonarqube\_home>/conf/sonar.properties 파일 수정
    - > sonar.web.host, sonar.web.context, sonar.web.port 를 주석해제하고 편집한다.

변경 전

```
sonar.properties
86 #-----
87 # WEB SERVER
88
89 # Binding IP address. For servers with more than one IP address, this property specifies which
90 # address will be used for listening on the specified ports.
91 # By default, ports will be used on all IP addresses associated with the server.
92 #sonar.web.host=0.0.0.0
93
94 # Web context. When set, it must start with forward slash (for example /sonarqube).
95 # The default value is root context (empty value).
96 #sonar.web.context=
97
98 # TCP port for incoming HTTP connections. Disabled when value is -1.
99 #sonar.web.port=9000
```

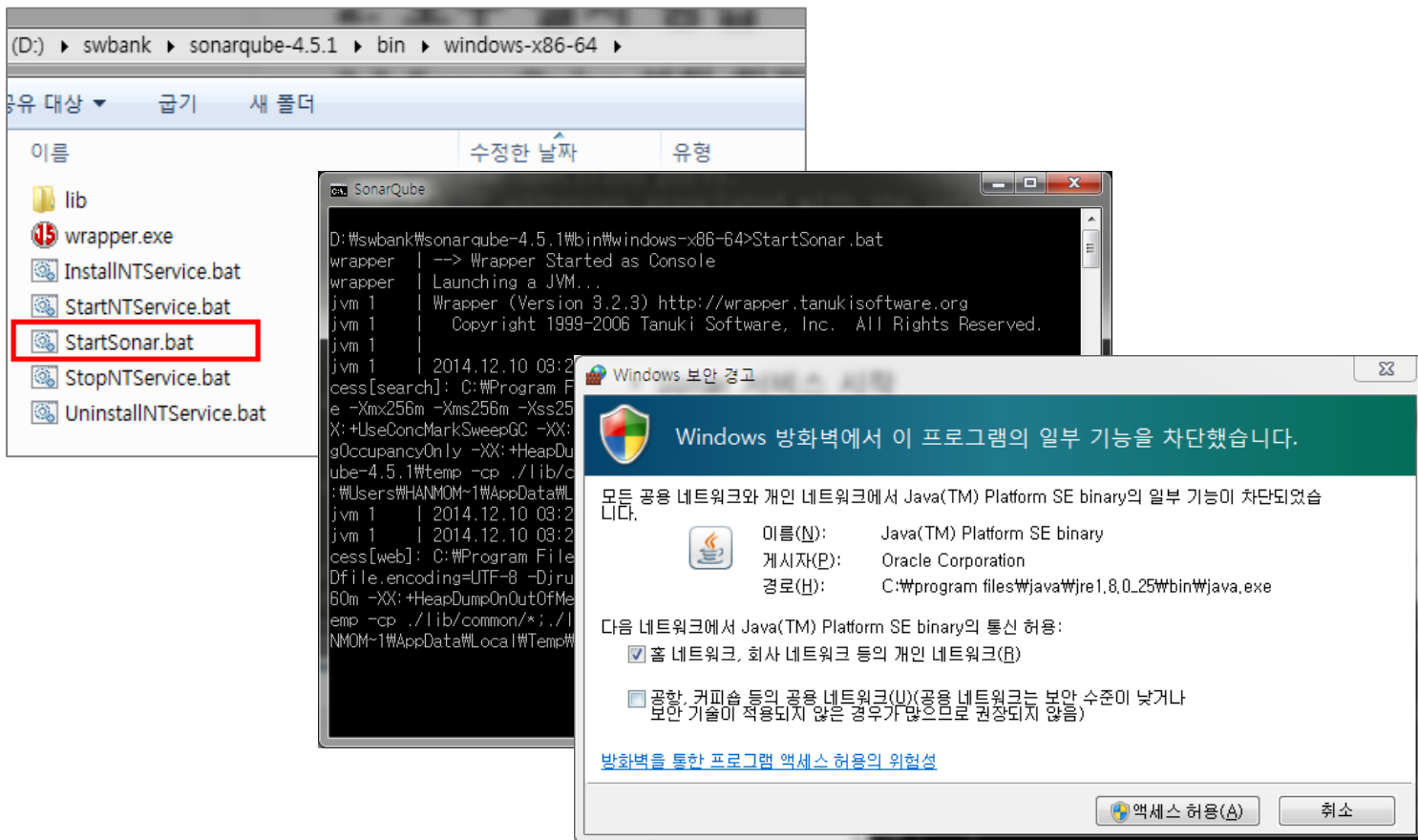
변경 후

```
sonar.properties
86 #-----
87 # WEB SERVER
88
89 # Binding IP address. For servers with more than one IP address, this property specifies which
90 # address will be used for listening on the specified ports.
91 # By default, ports will be used on all IP addresses associated with the server.
92 sonar.web.host=127.0.0.1
93
94 # Web context. When set, it must start with forward slash (for example /sonarqube).
95 # The default value is root context (empty value).
96 sonar.web.context=/sonarqube
97
98 # TCP port for incoming HTTP connections. Disabled when value is -1.
99 sonar.web.port=9000
```

## 2. 설치 및 실행

### 2.3 SonarQube 설치 하기 (5/6)

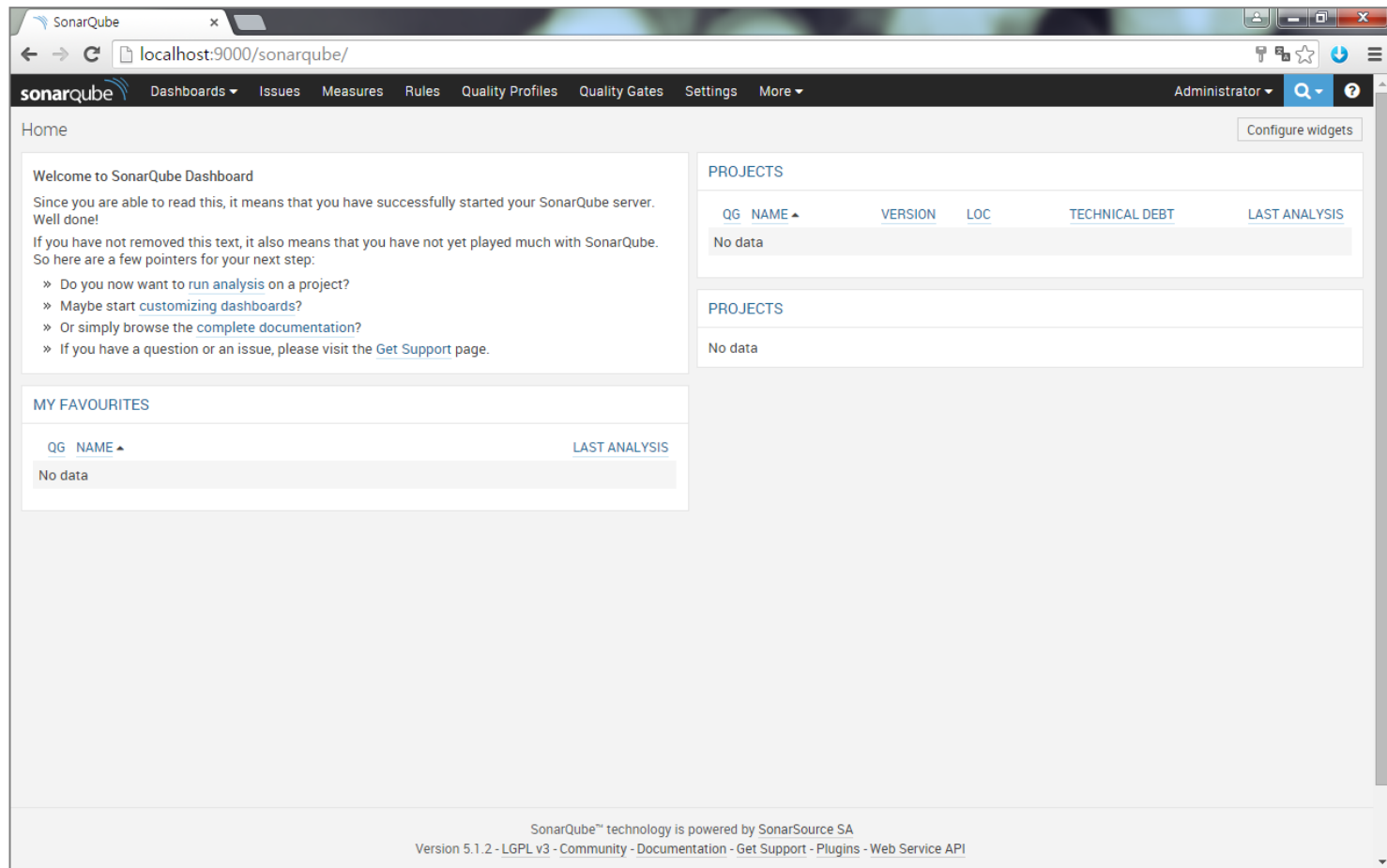
- Sonar 서비스 시작
  - <sonarqube\_home>/bin/<사용자OS>/ 폴더에서 StartSonar.bat 파일 실행
  - VM 관련 에러가 날 경우 <sonarqube\_home>/conf/wrapper.conf 파일 내의 wrapper.java.initmemory와 wrapper.java.maxmemory의 값을 128, 256으로 지정



## 2. 설치 및 실행

### 2.3 SonarQube 설치 하기 (6/6)

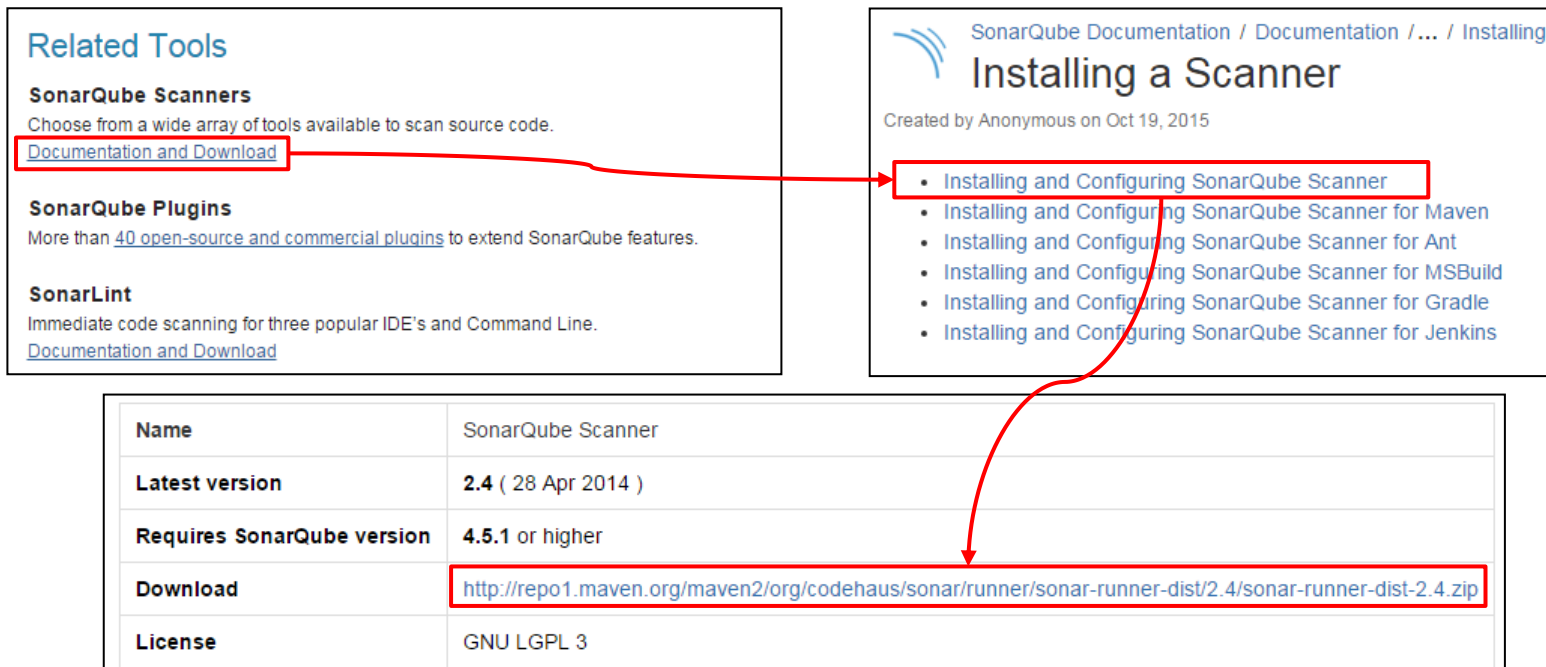
- 웹 브라우저에서 다음 주소로 접속
  - <http://localhost:9000/sonarqube>
  - > 접속이 되면 Sonar 설치 완료 (최초 로그인 ID/PW : admin / admin)



## 2. 설치 및 실행

### 2.4 SonarQube Runner 설치 하기 (1/4)

- Sonar 에서는 분석을 위한 여러 클라이언트를 제공함
    - Sonar runner : 권장되는 기본 클라이언트
    - Maven : Maven 기반으로 작성된 프로젝트에 적합
    - Ant Task : Ant 기반으로 작성된 프로젝트에 적합
  - 본 예제에서는 제작사에서 권장하는 Sonar runner를 설치
    - SonarQube의 다운로드 사이트에서 Sonar Runner(Scanner) 다운로드
- > <http://www.sonarqube.org/downloads/>



**Related Tools**

**SonarQube Scanners**  
Choose from a wide array of tools available to scan source code.  
[Documentation and Download](#)

**SonarQube Plugins**  
More than [40 open-source and commercial plugins](#) to extend SonarQube features.

**SonarLint**  
Immediate code scanning for three popular IDE's and Command Line.  
[Documentation and Download](#)

**SonarQube Documentation / Documentation / ... / Installing**  
**Installing a Scanner**  
Created by Anonymous on Oct 19, 2015

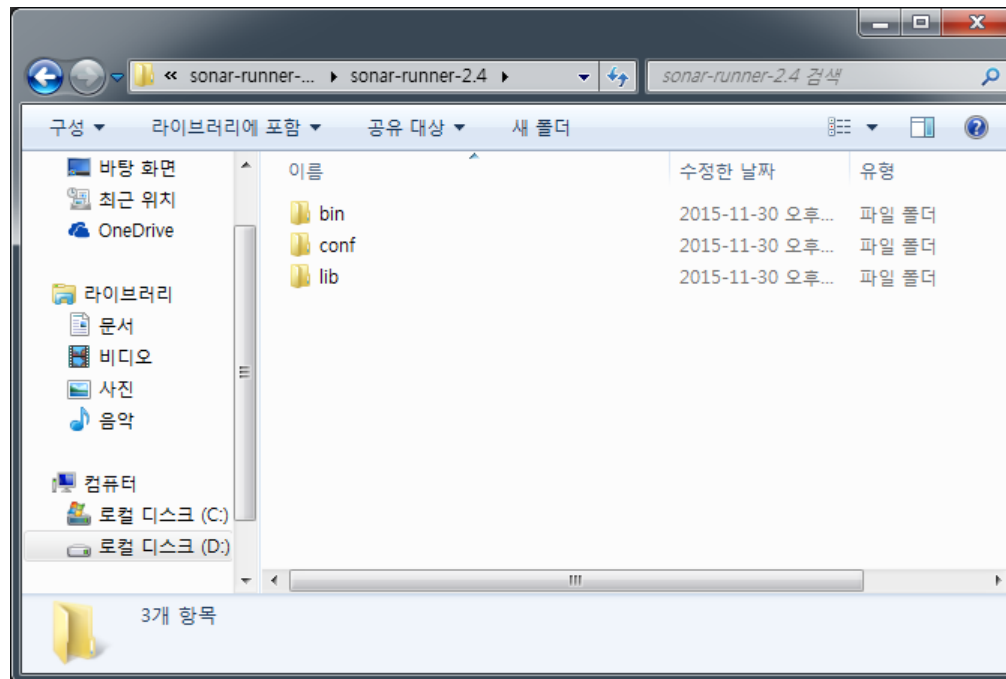
- [Installing and Configuring SonarQube Scanner](#)
- [Installing and Configuring SonarQube Scanner for Maven](#)
- [Installing and Configuring SonarQube Scanner for Ant](#)
- [Installing and Configuring SonarQube Scanner for MSBuild](#)
- [Installing and Configuring SonarQube Scanner for Gradle](#)
- [Installing and Configuring SonarQube Scanner for Jenkins](#)

|                                   |                                                                                                                                                                                                                               |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Name</b>                       | SonarQube Scanner                                                                                                                                                                                                             |
| <b>Latest version</b>             | 2.4 ( 28 Apr 2014 )                                                                                                                                                                                                           |
| <b>Requires SonarQube version</b> | 4.5.1 or higher                                                                                                                                                                                                               |
| <b>Download</b>                   | <a href="http://repo1.maven.org/maven2/org/codehaus/sonar/runner/sonar-runner-dist/2.4/sonar-runner-dist-2.4.zip">http://repo1.maven.org/maven2/org/codehaus/sonar/runner/sonar-runner-dist/2.4/sonar-runner-dist-2.4.zip</a> |
| <b>License</b>                    | GNU LGPL 3                                                                                                                                                                                                                    |

## 2. 설치 및 실행

### 2.4 SonarQube Runner 설치 하기 (2/4)

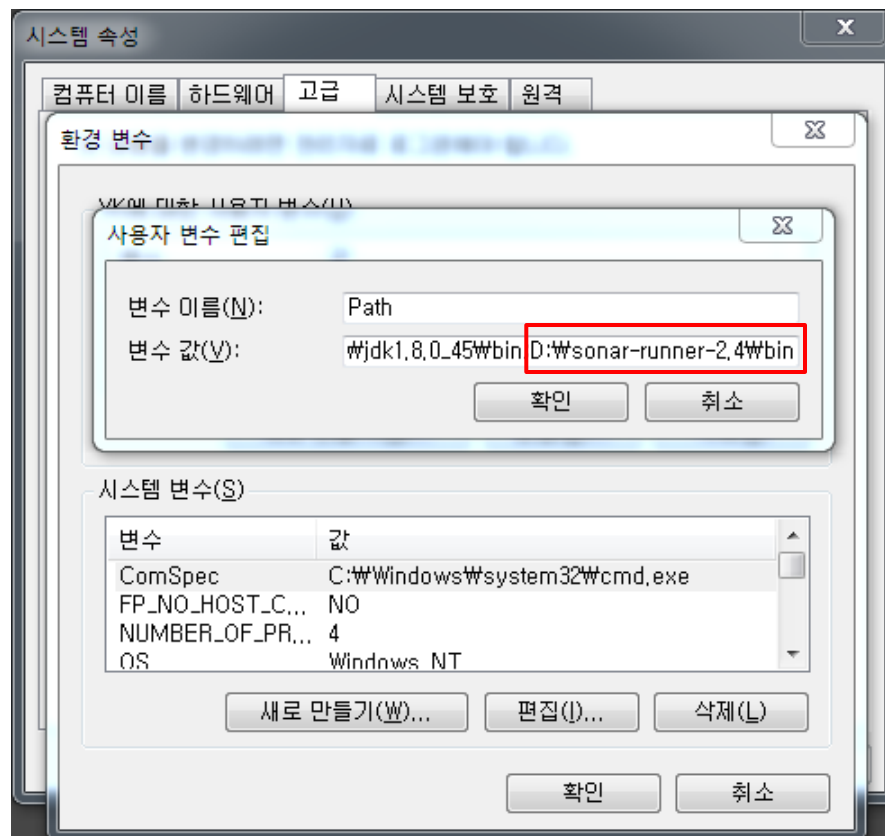
- 다운로드 및 압축 해제
  - SonarQube Runner는 별도의 설치 과정 없이 압축 해제만으로 설치 완료



## 2. 설치 및 실행

### 2.4 SonarQube Runner 설치 하기 (3/4)

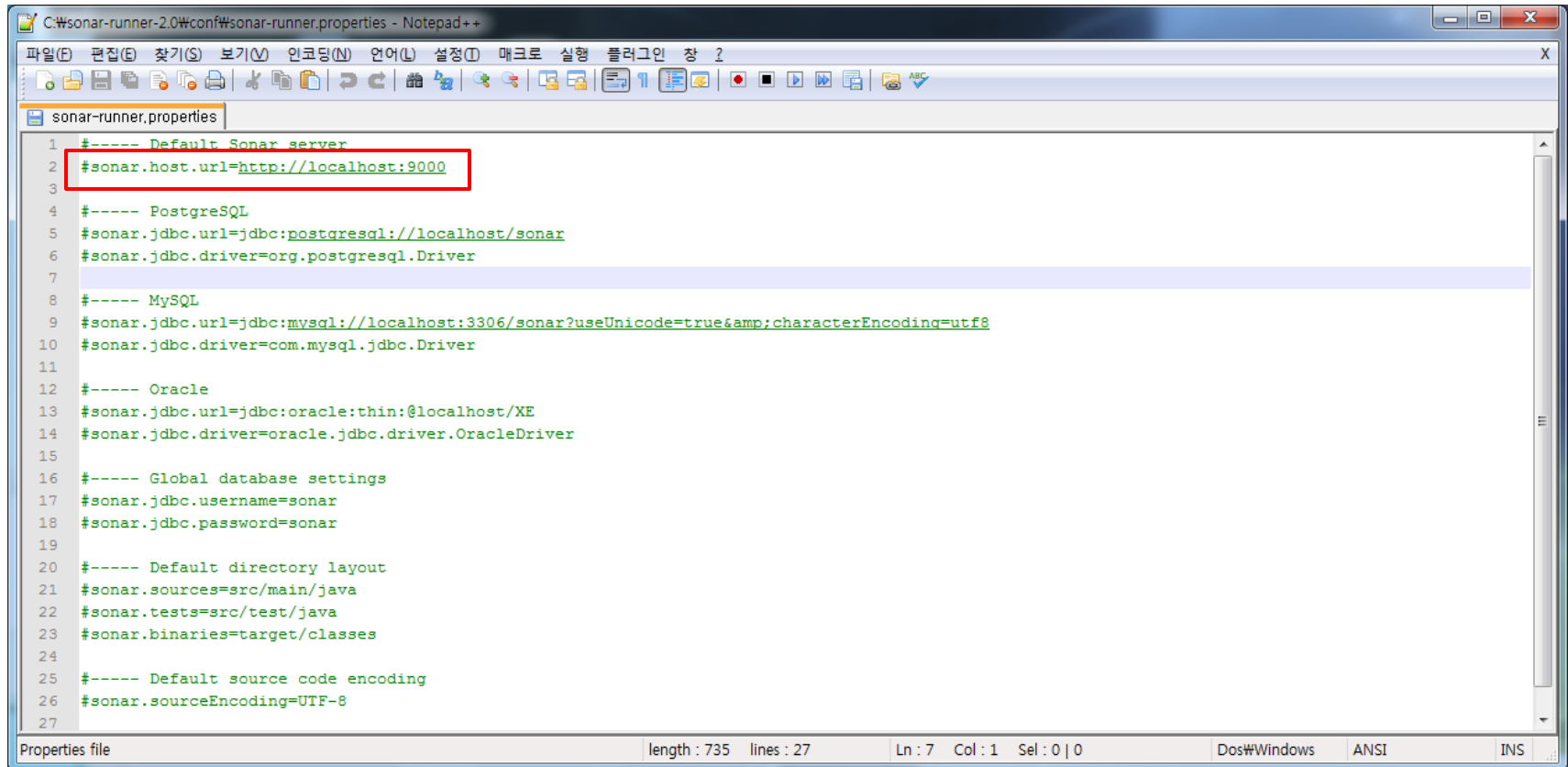
- 환경변수 등록
  - > 설치한 폴더의 bin 폴더를 path에 환경변수 등록



## 2. 설치 및 실행

### 2.4 SonarQube Runner 설치 하기 (4/4)

- Sonar runner 환경 설정
  - “설치폴더\conf\sonar-runner.properties” 파일을 Sonar에서 세팅한 값과 맞춤
    - > 본 예제에서 사용할 내장 server 사용을 위해 두 번째 줄을 수정  
“#sonar.host.url=http://localhost:9000” -> “sonar.host.url=http://localhost:9000/sonarqube”



```
C:\sonar-runner-2.0\conf\sonar-runner.properties - Notepad++
파일(F) 편집(E) 찾기(S) 보기(V) 인코딩(N) 언어(L) 설정(O) 매크로 실행 플러그인 창 ?
sonar-runner.properties
1 #----- Default Sonar server
2 #sonar.host.url=http://localhost:9000
3
4 #----- PostgreSQL
5 #sonar.jdbc.url=jdbc:postgresql://localhost/sonar
6 #sonar.jdbc.driver=org.postgresql.Driver
7
8 #----- MySQL
9 #sonar.jdbc.url=jdbc:mysql://localhost:3306/sonar?useUnicode=true&characterEncoding=utf8
10 #sonar.jdbc.driver=com.mysql.jdbc.Driver
11
12 #----- Oracle
13 #sonar.jdbc.url=jdbc:oracle:thin:@localhost/XE
14 #sonar.jdbc.driver=oracle.jdbc.driver.OracleDriver
15
16 #----- Global database settings
17 #sonar.jdbc.username=sonar
18 #sonar.jdbc.password=sonar
19
20 #----- Default directory layout
21 #sonar.sources=src/main/java
22 #sonar.tests=src/test/java
23 #sonar.binaries=target/classes
24
25 #----- Default source code encoding
26 #sonar.sourceEncoding=UTF-8
27
Properties file      length : 735   lines : 27      Ln : 7   Col : 1   Sel : 0 | 0      Dos#Windows  ANSI  INS
```

# 3. 주요 기능

## 세부목차

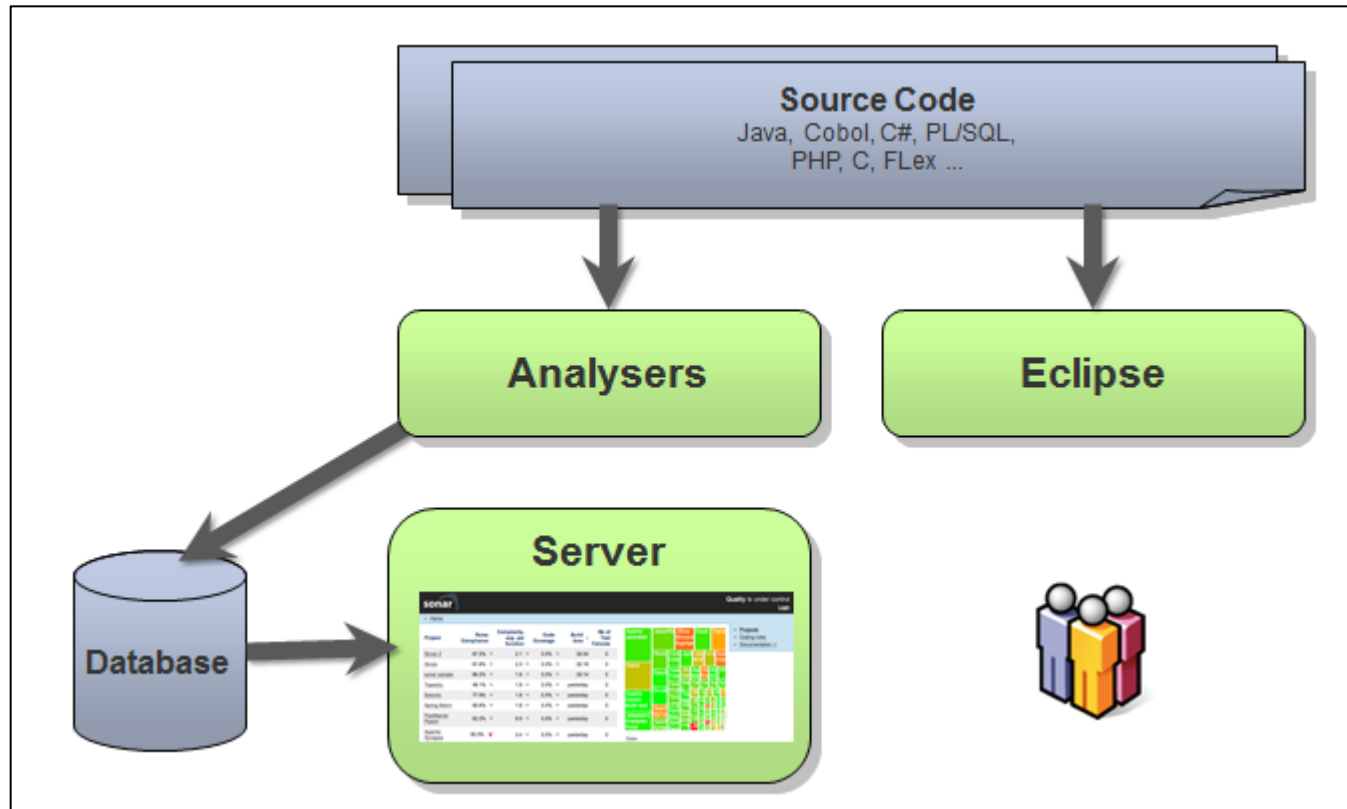
---

- 3.1 Sonar 소개
- 3.2 Sonar 메뉴 설명
- 3.3 Sonar 환경 설정
- 3.4 계획 수립
- 3.5 이슈 관리
- 3.6 Sonar runner 사용법
- 3.7 주요 추가 기능 (2.0)

# 3. 주요 기능

## 3.1 Sonar 소개 (1/3)

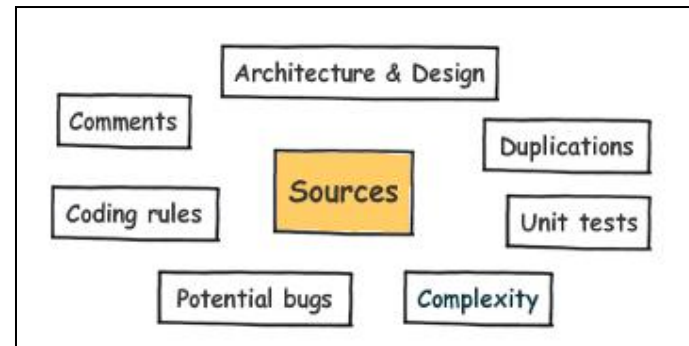
- Sonar는 Checkstyle, PMD, FindBugs, Cobertura등의 분석 툴들을 이용하여 소스의 정적분석을 실시하고, 이를 웹 브라우저를 통하여 전체적인 분석결과를 보여주는 툴임



# 3. 주요 기능

## 3.1 Sonar 소개 (2/3)

- Sonar가 제공하는 분석 결과는 다음과 같음
  - Duplicate code
  - Coding standards
  - Code coverage
  - Complex code
  - Potential bugs
  - Comment
  - Design and Architecture



- 기본적으로는 Java 언어를 분석할 수 있지만, 추가 플러그인을 통하여 다른 대부분의 언어에 대해서도 검사 가능
  - C, C#, PHP, Flex, Groovy, JavaScript, Python, PL/SQL, Cobol, Visual Basic 6

## 3. 주요 기능

### 3.1 Sonar 소개 (3/3)

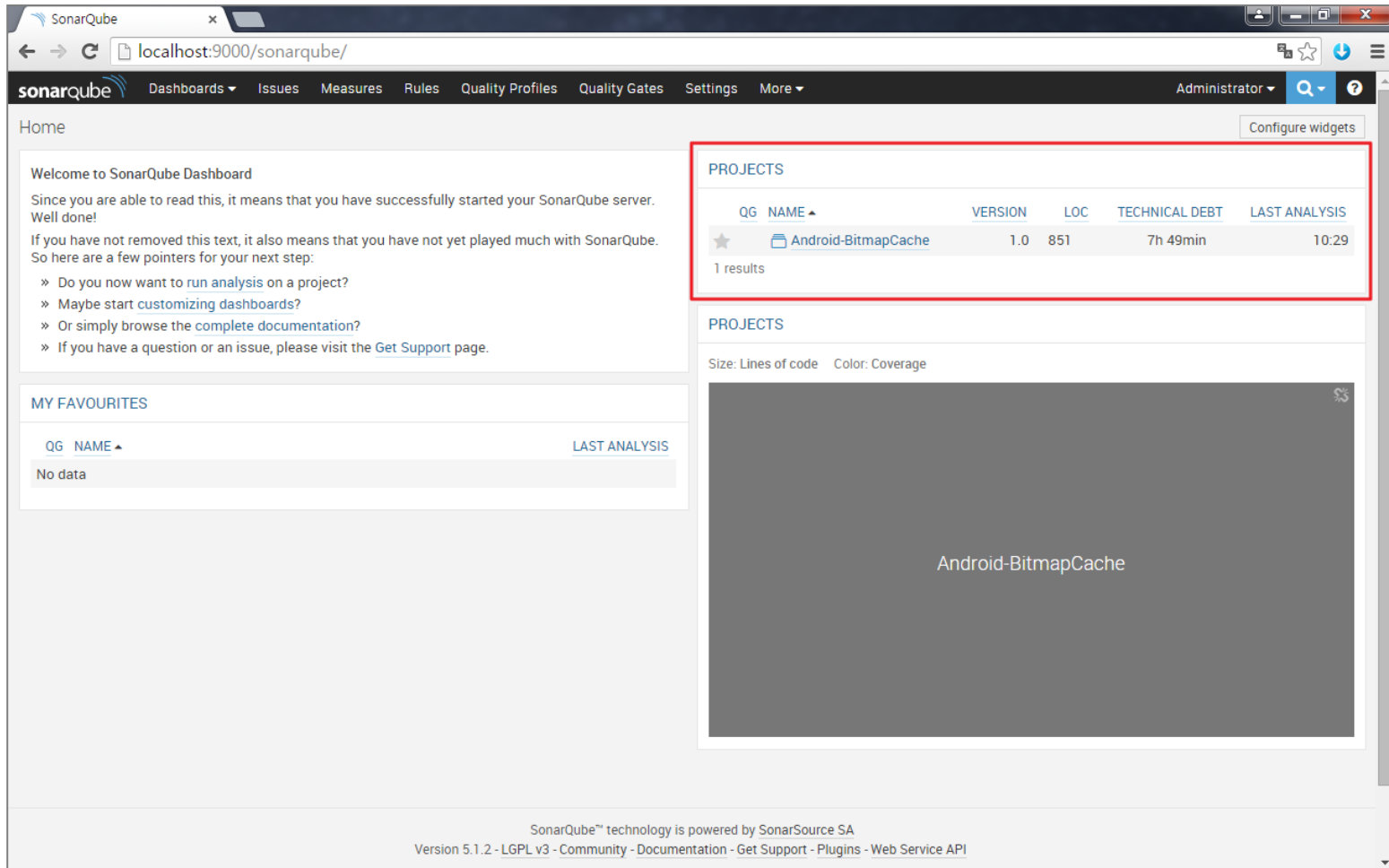
---

- Sonar 자체는 분석 결과를 보여주는 툴. 실제 분석은 Sonar 내의 Plug-in을 통하여 분석
  - 기본적으로 제공되는 분석 툴
    - > PMD : 소스코드의 표준 준수 분석
    - > FindBugs : 자바 바이트 코드를 분석하여 정적 분석
    - > CheckStyle : 코딩 스타일 체크
    - > Cobertura : 테스트 커버리지 체크
    - > Surefire : 유닛 테스트
- Sonar에서 분석 결과를 보기 위해 분석을 위한 Client의 종류는 다음과 같음
  - Sonar runner : 권장되는 기본 클라이언트
  - Maven : Maven 기반으로 작성된 프로젝트에 적합
  - Ant Task : Ant 기반으로 작성된 프로젝트에 적합

# 3. 주요 기능

## 3.2 Sonar 메뉴 설명 (1/8)

- Sonar의 메인 화면의 Dashboard
  - Project 에서 분석된 프로젝트들의 목록을 볼 수 있음



The screenshot shows the SonarQube web interface. The top navigation bar includes links for Dashboards, Issues, Measures, Rules, Quality Profiles, Quality Gates, Settings, and More. The main content area is divided into sections. The 'PROJECTS' section is highlighted with a red box and contains a table with the following data:

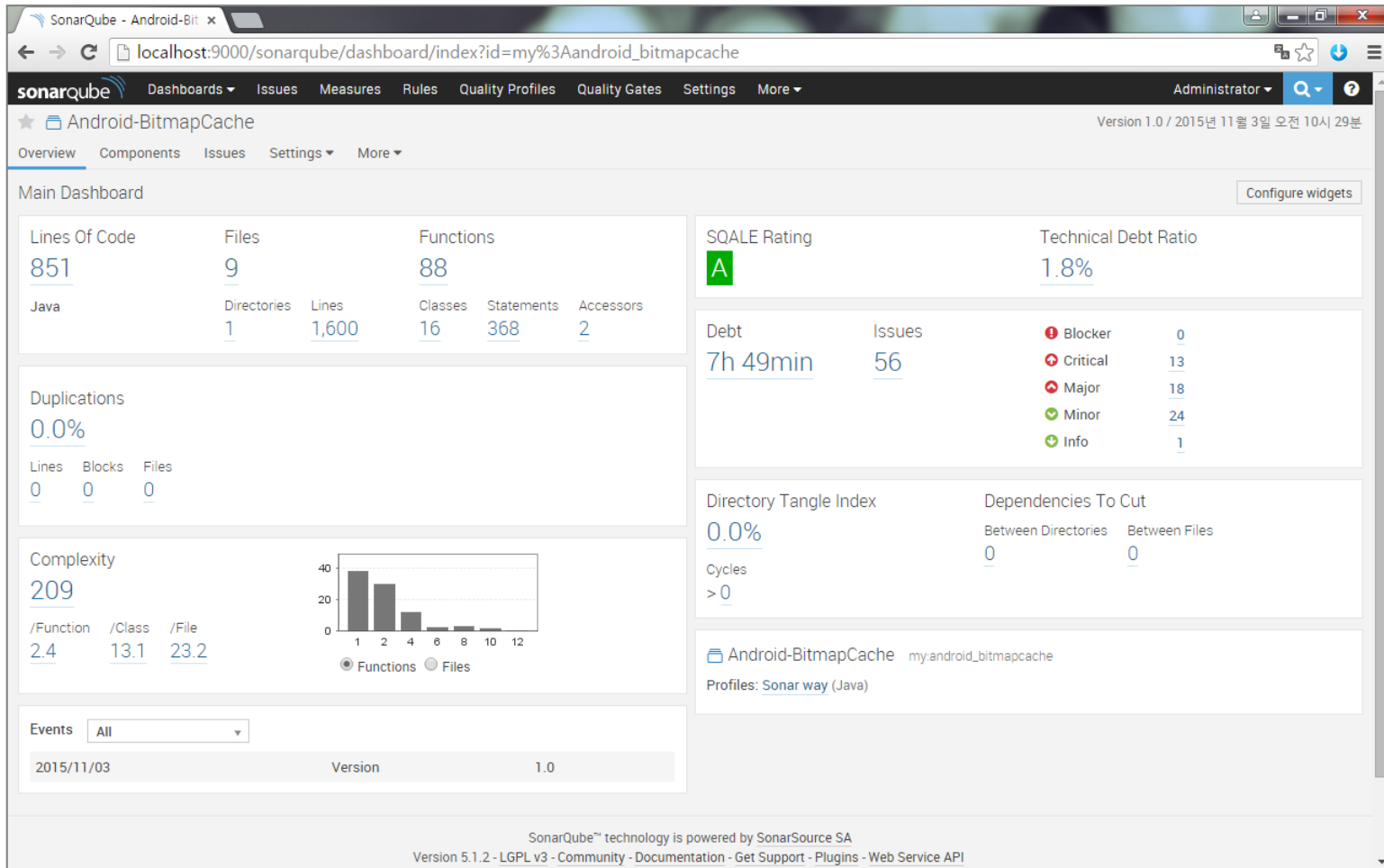
| QG | NAME                | VERSION | LOC | TECHNICAL DEBT | LAST ANALYSIS |
|----|---------------------|---------|-----|----------------|---------------|
| ★  | Android-BitmapCache | 1.0     | 851 | 7h 49min       | 10:29         |

Below the table, it indicates '1 results'. The 'MY FAVOURITES' section shows 'No data'. The bottom of the dashboard features a large grey area with the text 'Android-BitmapCache' and a footer with version and license information.

# 3. 주요 기능

## 3.2 Sonar 메뉴 설명 (2/8)

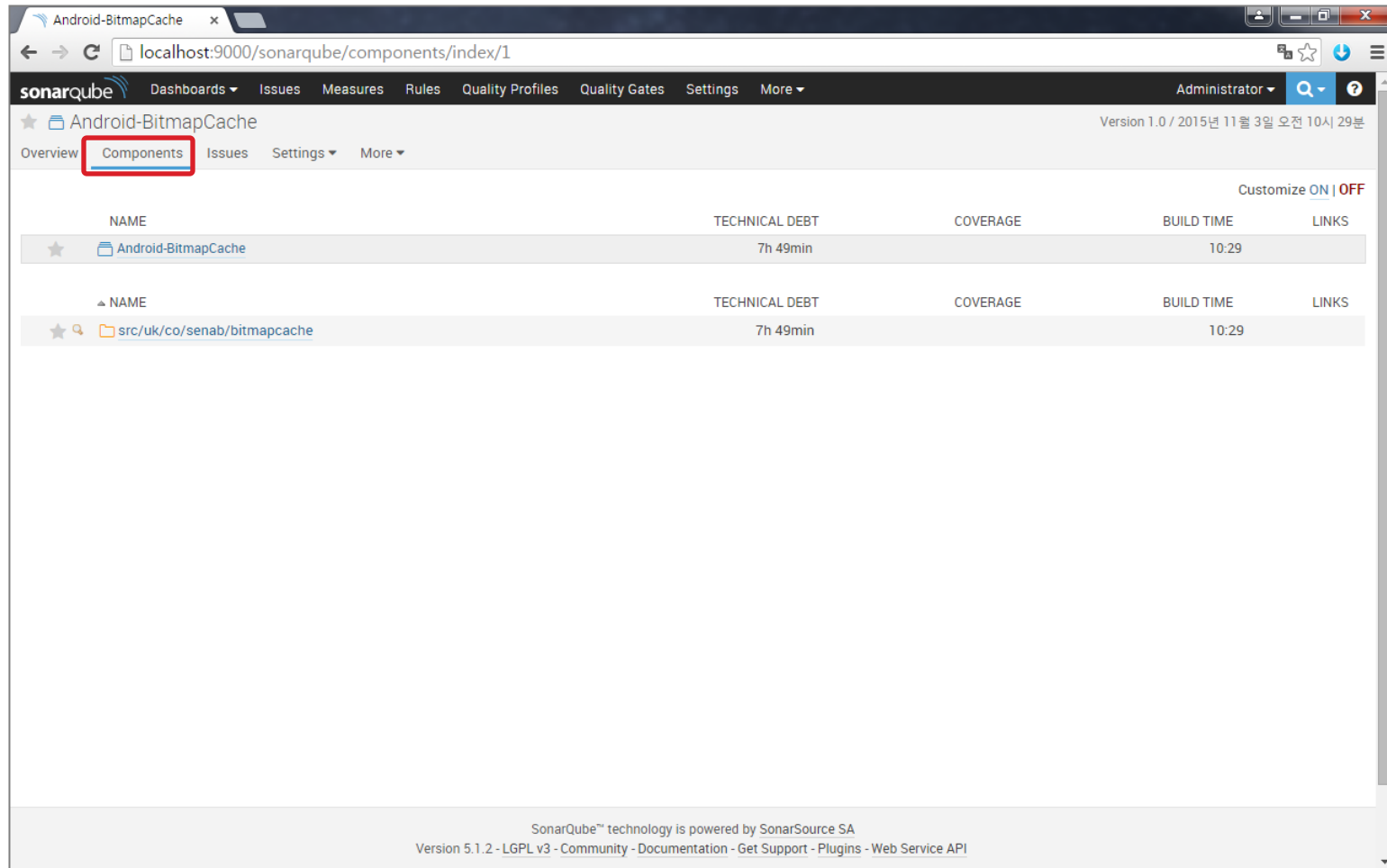
- Overview : 프로젝트 내의 Dashboard
  - 분석 결과의 전체적인 내용을 요약하여 보여줌



# 3. 주요 기능

## 3.2 Sonar 메뉴 설명 (3/8)

- Components 메뉴
  - 프로젝트를 컴포넌트 별로 시각화하여 보여줌



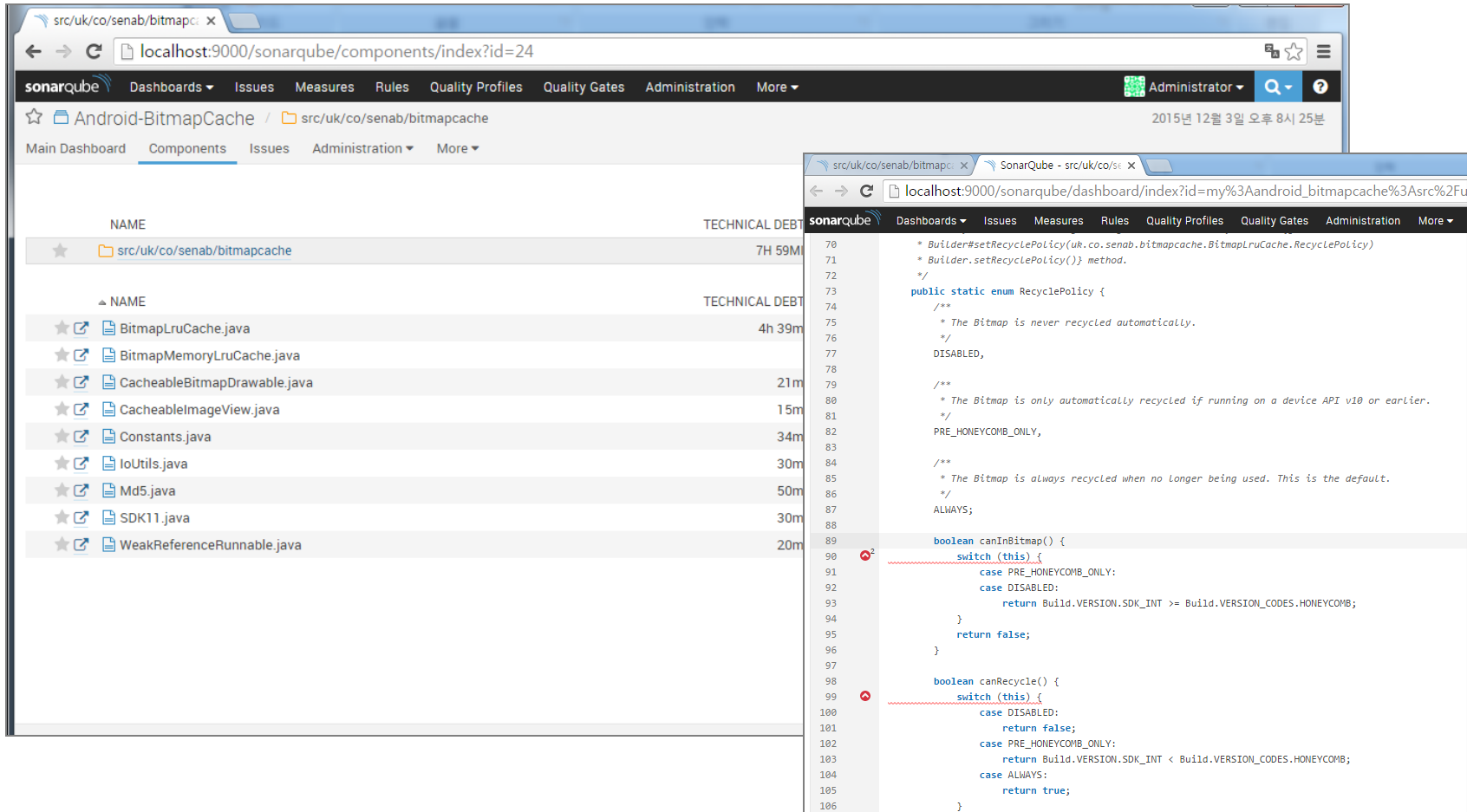
The screenshot shows the SonarQube web interface. The browser address bar displays `localhost:9000/sonarqube/components/index/1`. The top navigation bar includes links for Dashboards, Issues, Measures, Rules, Quality Profiles, Quality Gates, Settings, and More. The user is logged in as Administrator. The main header shows the project name "Android-BitmapCache" and the version "Version 1.0 / 2015년 11월 3일 오전 10시 29분". Below the header, the "Components" tab is selected and highlighted with a red box. The main content area displays a table of components. The table has columns for NAME, TECHNICAL DEBT, COVERAGE, BUILD TIME, and LINKS. The first row shows the project "Android-BitmapCache" with a technical debt of 7h 49min and a build time of 10:29. The second row shows a sub-component "src/uk/co/senab/bitmapcache" with the same technical debt and build time. The footer of the page indicates that SonarQube technology is powered by SonarSource SA and provides links for Version 5.1.2, LGPL v3, Community, Documentation, Get Support, Plugins, and Web Service API.

| NAME                          | TECHNICAL DEBT | COVERAGE | BUILD TIME | LINKS |
|-------------------------------|----------------|----------|------------|-------|
| ★ Android-BitmapCache         | 7h 49min       |          | 10:29      |       |
| ▲ NAME                        | TECHNICAL DEBT | COVERAGE | BUILD TIME | LINKS |
| ★ src/uk/co/senab/bitmapcache | 7h 49min       |          | 10:29      |       |

# 3. 주요 기능

## 3.2 Sonar 메뉴 설명 (4/8)

- Components Drill-Down
  - 폴더 - 소스파일 로 Drill-Down하여 소스코드까지 확인 가능함



The screenshot displays the SonarQube web interface. The main window shows the 'Components' page for the project 'src/uk/co/senab/bitmapcache'. A table lists various source files with their respective technical debt values. An inset window shows the source code for the 'RecyclePolicy' enum, demonstrating the drill-down capability from the component list to the actual code.

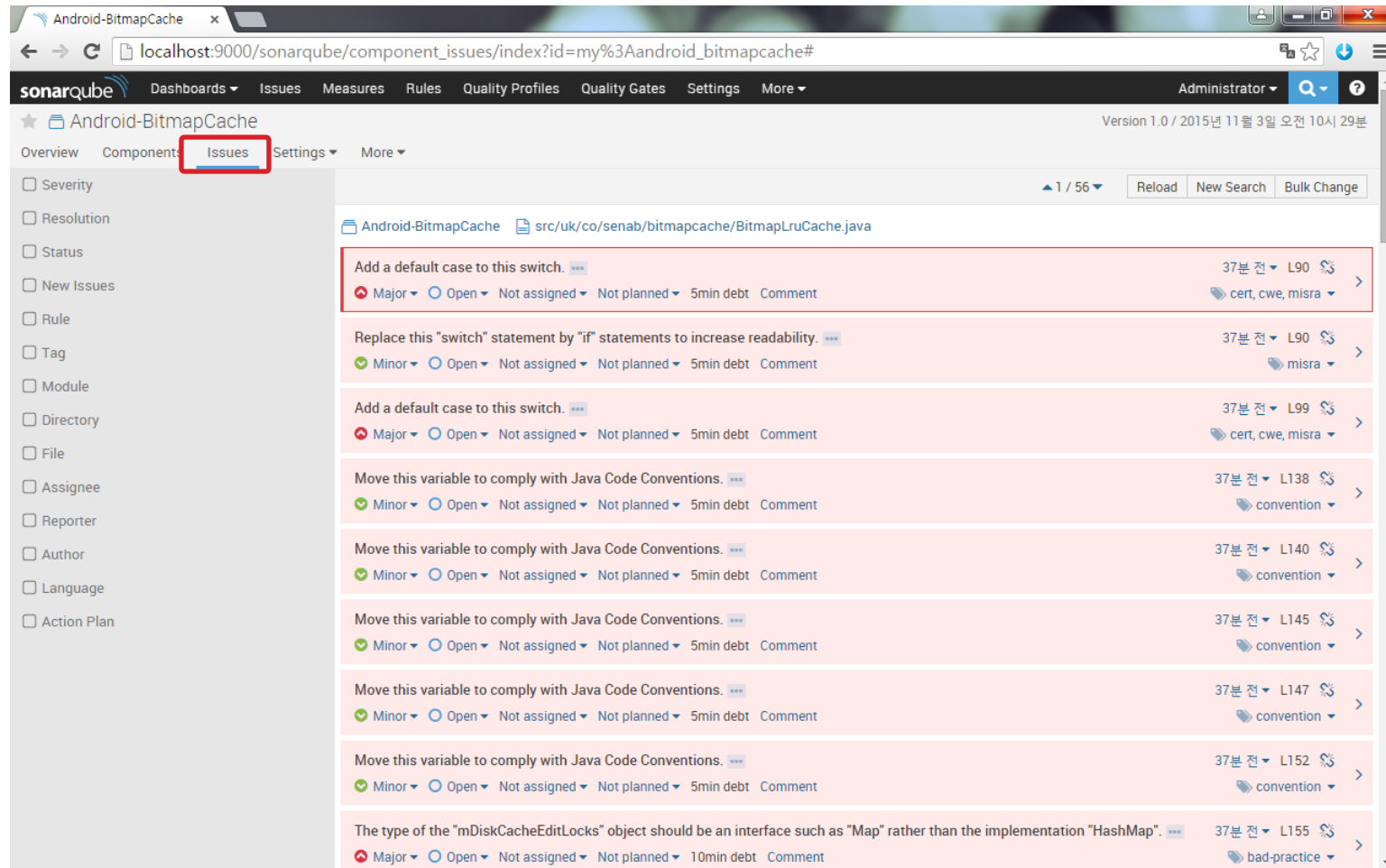
| NAME                         | TECHNICAL DEBT |
|------------------------------|----------------|
| src/uk/co/senab/bitmapcache  | 7H 59m         |
| ▲ NAME                       | TECHNICAL DEBT |
| BitmapLruCache.java          | 4h 39m         |
| BitmapMemoryLruCache.java    |                |
| CacheableBitmapDrawable.java | 21m            |
| CacheableImageView.java      | 15m            |
| Constants.java               | 34m            |
| IoUtils.java                 | 30m            |
| Md5.java                     | 50m            |
| SDK11.java                   | 30m            |
| WeakReferenceRunnable.java   | 20m            |

```
70 * Builder#setRecyclePolicy(uk.co.senab.bitmapcache.BitmapLruCache.RecyclePolicy)
71 * Builder.setRecyclePolicy() method.
72 */
73 public static enum RecyclePolicy {
74     /**
75      * The Bitmap is never recycled automatically.
76      */
77     DISABLED,
78
79     /**
80      * The Bitmap is only automatically recycled if running on a device API v10 or earlier.
81      */
82     PRE_HONEYCOMB_ONLY,
83
84     /**
85      * The Bitmap is always recycled when no longer being used. This is the default.
86      */
87     ALWAYS;
88
89     boolean canInBitmap() {
90         switch (this) {
91             case PRE_HONEYCOMB_ONLY:
92             case DISABLED:
93                 return Build.VERSION.SDK_INT >= Build.VERSION_CODES.HONEYCOMB;
94         }
95         return false;
96     }
97
98     boolean canRecycle() {
99         switch (this) {
100             case DISABLED:
101                 return false;
102             case PRE_HONEYCOMB_ONLY:
103                 return Build.VERSION.SDK_INT < Build.VERSION_CODES.HONEYCOMB;
104             case ALWAYS:
105                 return true;
106         }
107     }
108 }
```

# 3. 주요 기능

## 3.2 Sonar 메뉴 설명 (5/8)

- Issues 메뉴
  - 현재 프로젝트에서의 활동 사항을 보여줌



Android-BitmapCache

localhost:9000/sonarqube/component\_issues/index?id=my%3Aandroid\_bitmapcache#

sonarqube Dashboards Issues Measures Rules Quality Profiles Quality Gates Settings More

Administrator

Android-BitmapCache

Overview Components **Issues** Settings More

Severity Resolution Status New Issues Rule Tag Module Directory File Assignee Reporter Author Language Action Plan

1 / 56

Reload New Search Bulk Change

Android-BitmapCache src/uk/co/senab/bitmapcache/BitmapLruCache.java

Add a default case to this switch. ... 37분 전 L90 cert, cwe, misra

Major Open Not assigned Not planned 5min debt Comment

Replace this "switch" statement by "if" statements to increase readability. ... 37분 전 L90 misra

Minor Open Not assigned Not planned 5min debt Comment

Add a default case to this switch. ... 37분 전 L99 cert, cwe, misra

Major Open Not assigned Not planned 5min debt Comment

Move this variable to comply with Java Code Conventions. ... 37분 전 L138 convention

Minor Open Not assigned Not planned 5min debt Comment

Move this variable to comply with Java Code Conventions. ... 37분 전 L140 convention

Minor Open Not assigned Not planned 5min debt Comment

Move this variable to comply with Java Code Conventions. ... 37분 전 L145 convention

Minor Open Not assigned Not planned 5min debt Comment

Move this variable to comply with Java Code Conventions. ... 37분 전 L147 convention

Minor Open Not assigned Not planned 5min debt Comment

Move this variable to comply with Java Code Conventions. ... 37분 전 L152 convention

Minor Open Not assigned Not planned 5min debt Comment

The type of the "mDiskCacheEditLocks" object should be an interface such as "Map" rather than the implementation "HashMap". ... 37분 전 L155 bad-practice

Major Open Not assigned Not planned 10min debt Comment

# 3. 주요 기능

## 3.2 Sonar 메뉴 설명 (6/8)

- Issues 하위 메뉴
  - 분석결과 중, 수정사항이 필요한 부분들을 계층별로 탐색하여 보여줌

The screenshot shows the SonarQube web interface for the 'Android-BitmapCache' component. The left sidebar contains the 'Issues' menu with various filters. The main area displays a list of issues, including 'Add a default case to this switch.', 'Replace this "switch" statement by "if" statements to increase readability.', and 'Move this variable to comply with Java Code Conventions.'

**Issues Menu Filters:**

- ☒ Severity
  - Blocker 0
  - Critical 13
  - Major 18
  - Minor 24
  - Info 1
- ☐ Resolution
- ☐ Status
- ☐ New Issues
- ☒ Rule
  - The members of an interface declaration o 22
  - Throwable.printStackTrace(...) should not b 7
  - Exception handlers should preserve the orig 6
  - Utility classes should not have public const 4
  - Control flow statements "if", "for", "while", "s 3
  - Method parameters, caught exceptions and 2
  - "switch" statements should end with a "def: 2
  - Methods should not be too complex 1
  - Deprecated elements should have both the 1
  - Modifiers should be declared in the correct 1
  - Deprecated code should be removed event: 1
  - "@Override" annotation should be used on a 1
  - "switch" statements should have at least 3 1
  - Declarations should use Java collection int: 1
  - Class names should not shadow interfaces 1
- ☐ Tag

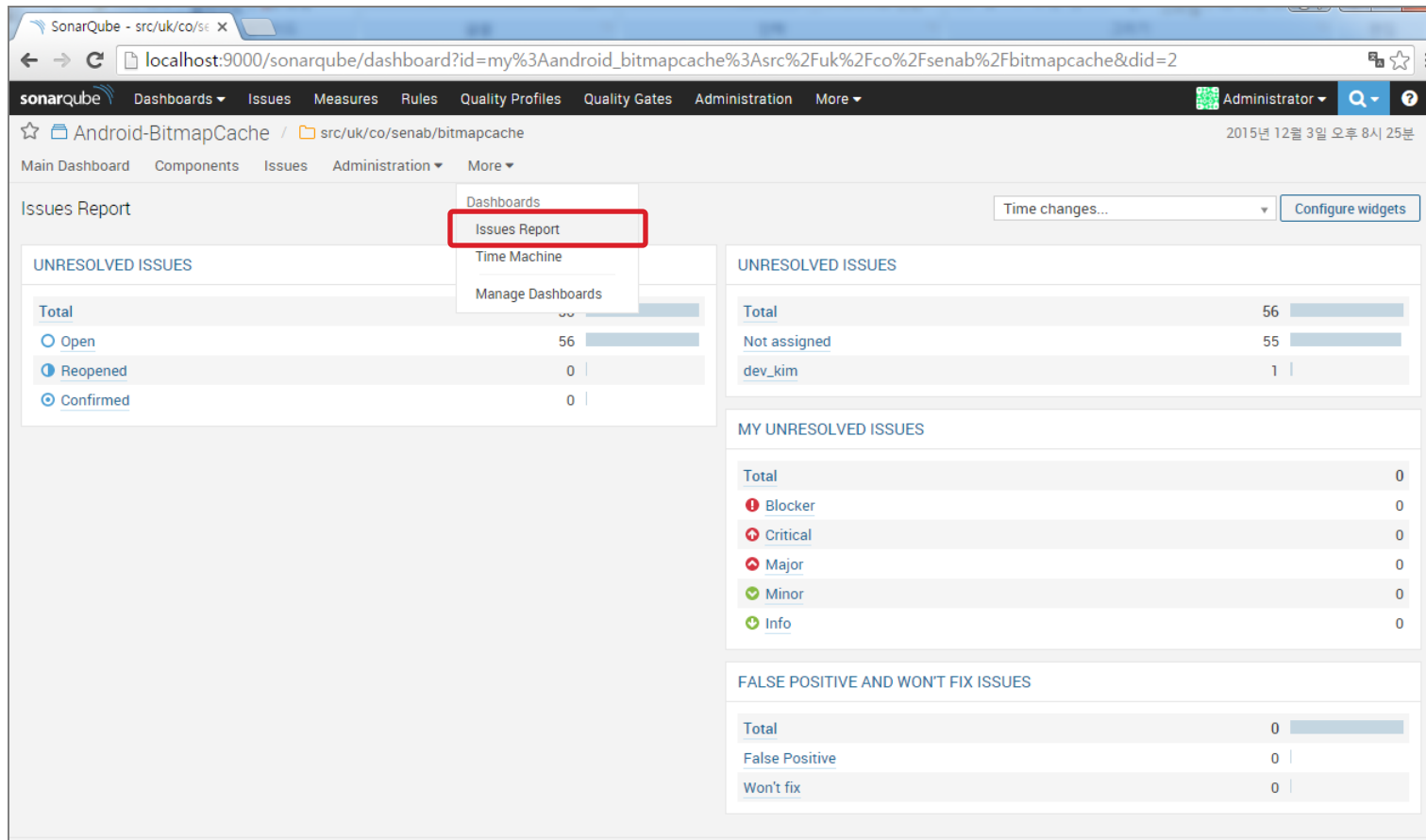
**Issues List:**

- Add a default case to this switch. ... 한시간 전 L90 cert, cwe, misra
- Replace this "switch" statement by "if" statements to increase readability. ... 한시간 전 L90 misra
- Add a default case to this switch. ... 한시간 전 L99 cert, cwe, misra
- Move this variable to comply with Java Code Conventions. ... 한시간 전 L138 convention
- Move this variable to comply with Java Code Conventions. ... 한시간 전 L140 convention
- Move this variable to comply with Java Code Conventions. ... 한시간 전 L145 convention
- Move this variable to comply with Java Code Conventions. ... 한시간 전 L147 convention
- Move this variable to comply with Java Code Conventions. ... 한시간 전 L152 convention
- The type of the "mDiskCacheEditLocks" object should be an interface such as "Map" rather than the implementation "HashMap". ... 한시간 전 L155 bad-practice

# 3. 주요 기능

## 3.2 Sonar 메뉴 설명 (7/8)

- Issue Report 메뉴
  - 이슈에 대한 처리상태, 중요도 등에 따라 이슈에 대한 통계를 확인할 수 있음



The screenshot displays the SonarQube web interface. The top navigation bar includes links for Dashboards, Issues, Measures, Rules, Quality Profiles, Quality Gates, Administration, and More. The 'Issues Report' menu item is highlighted with a red box. The main content area shows the 'Issues Report' for the project 'src/uk/co/senab/bitmapcache'. It includes a table of 'UNRESOLVED ISSUES' with columns for Total, Open, Reopened, and Confirmed. The 'Total' count is 56. The 'Open' count is 56. The 'Reopened' count is 0. The 'Confirmed' count is 0. The 'Time Machine' and 'Manage Dashboards' buttons are also visible. The right sidebar shows 'UNRESOLVED ISSUES' with a total of 56, and 'MY UNRESOLVED ISSUES' with a total of 0. The 'FALSE POSITIVE AND WON'T FIX ISSUES' section shows a total of 0.

| Category  | Count |
|-----------|-------|
| Total     | 56    |
| Open      | 56    |
| Reopened  | 0     |
| Confirmed | 0     |

| Category     | Count |
|--------------|-------|
| Total        | 56    |
| Not assigned | 55    |
| dev_kim      | 1     |

| Category | Count |
|----------|-------|
| Total    | 0     |
| Blocker  | 0     |
| Critical | 0     |
| Major    | 0     |
| Minor    | 0     |
| Info     | 0     |

| Category       | Count |
|----------------|-------|
| Total          | 0     |
| False Positive | 0     |
| Won't fix      | 0     |

# 3. 주요 기능

## 3.2 Sonar 메뉴 설명 (8/8)

- Time Machine 메뉴
  - 프로젝트 현황을 버전 및 기간별로 보여줌

The screenshot shows the SonarQube web interface for a project named 'Android-BitmapCache'. The 'Time Machine' menu is highlighted in the left sidebar. The main content area displays various project metrics for the date 2015/12/03.

**Time Machine Menu:**

- Time Machine (highlighted)
- Issues Report
- Manage Dashboards

**Project Metrics (2015/12/03):**

| Metric        | Value |
|---------------|-------|
| Lines of code | 851   |
| Lines         | 1,600 |
| Statements    | 368   |
| Files         | 9     |
| Classes       | 16    |
| Functions     | 88    |
| Accessors     |       |

**Code Quality Metrics (2015/12/03):**

| Metric                    | Value |
|---------------------------|-------|
| Comments (%)              | 20.9% |
| Comment lines             | 225   |
| Public documented API (%) | 69.6% |
| Public undocumented API   | 14    |

**Complexity Metrics (2015/12/03):**

| Metric               | Value |
|----------------------|-------|
| Complexity           | 209   |
| Complexity /function | 2.4   |
| Complexity /class    | 13.1  |
| Complexity /file     | 23.2  |

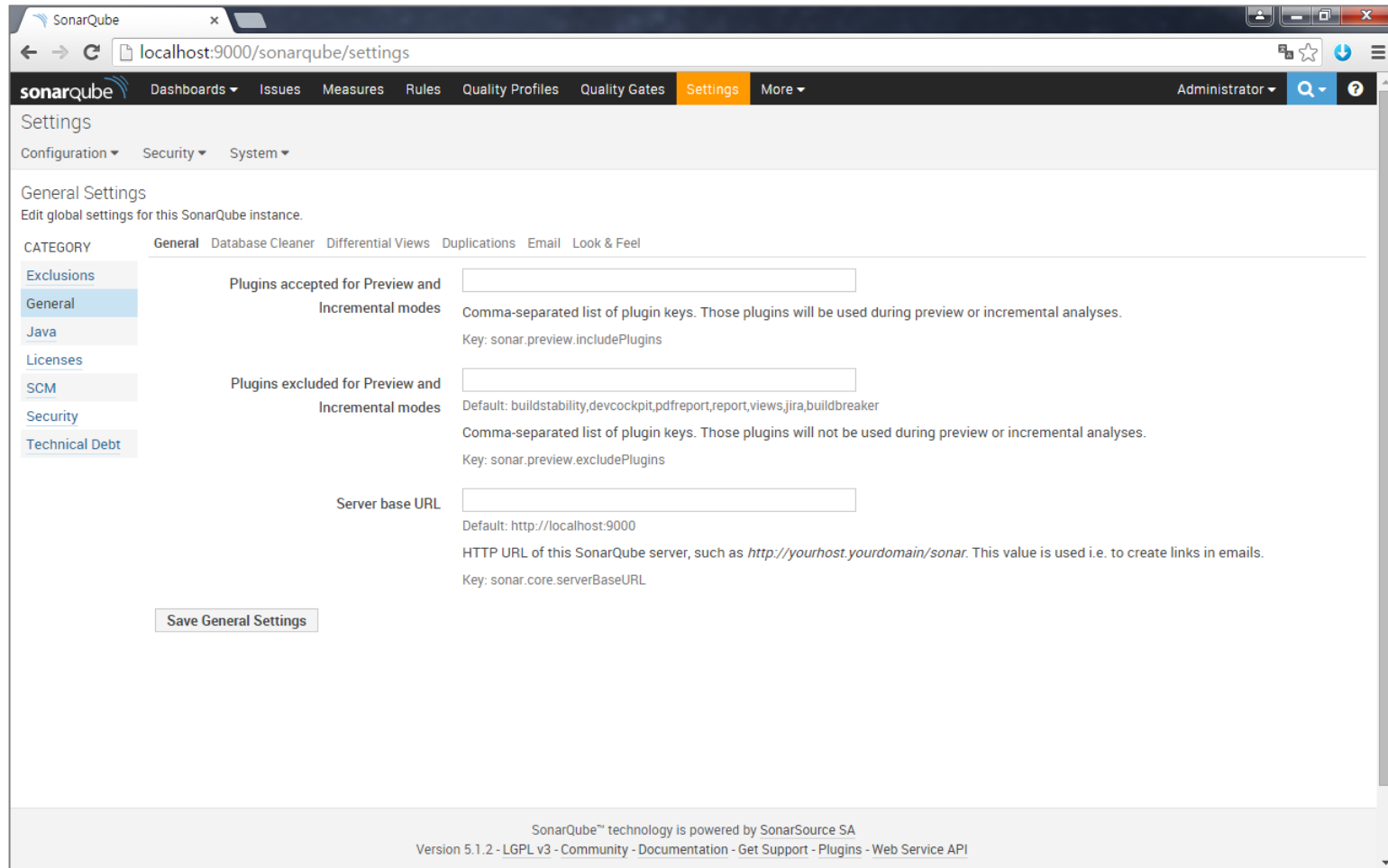
**Coverage Metrics (2015/12/03):**

| Metric                 | Value |
|------------------------|-------|
| Coverage               |       |
| Line coverage          |       |
| Condition coverage     |       |
| Unit tests success (%) |       |
| Unit tests failures    |       |
| Unit tests errors      |       |

# 3. 주요 기능

## 3.3 Sonar 환경 설정 (1/5)

- Sonar 전체 환경설정
  - 관리자 계정으로 접속하여 상단의 'Settings' 메뉴 선택



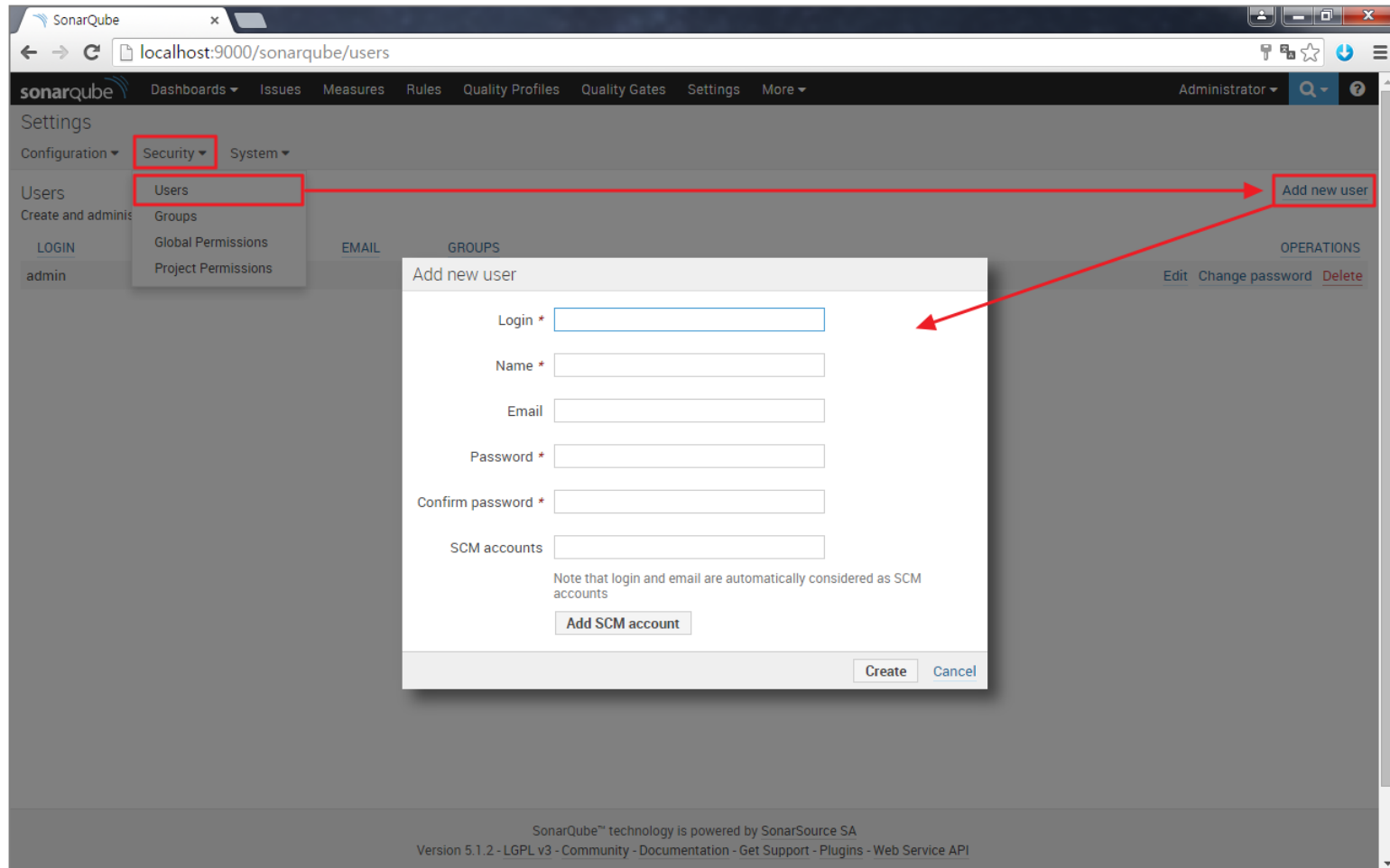
The screenshot shows the SonarQube web interface in a browser window. The address bar displays 'localhost:9000/sonarqube/settings'. The top navigation bar includes 'Dashboards', 'Issues', 'Measures', 'Rules', 'Quality Profiles', 'Quality Gates', 'Settings' (highlighted), and 'More'. The user is logged in as 'Administrator'. The 'Settings' page has a sidebar with categories: 'Configuration', 'Security', and 'System'. Under 'Configuration', there are sub-categories: 'General' (selected), 'Database Cleaner', 'Differential Views', 'Duplications', 'Email', and 'Look & Feel'. The 'General Settings' section is active, showing options for 'Plugins accepted for Preview and Incremental modes', 'Plugins excluded for Preview and Incremental modes', and 'Server base URL'. Each option has a text input field and a description. A 'Save General Settings' button is at the bottom left. The footer contains version information and links to documentation and support.

SonarQube™ technology is powered by SonarSource SA  
Version 5.1.2 - [LGPL v3](#) - [Community](#) - [Documentation](#) - [Get Support](#) - [Plugins](#) - [Web Service API](#)

# 3. 주요 기능

## 3.3 Sonar 환경 설정 (2/5)

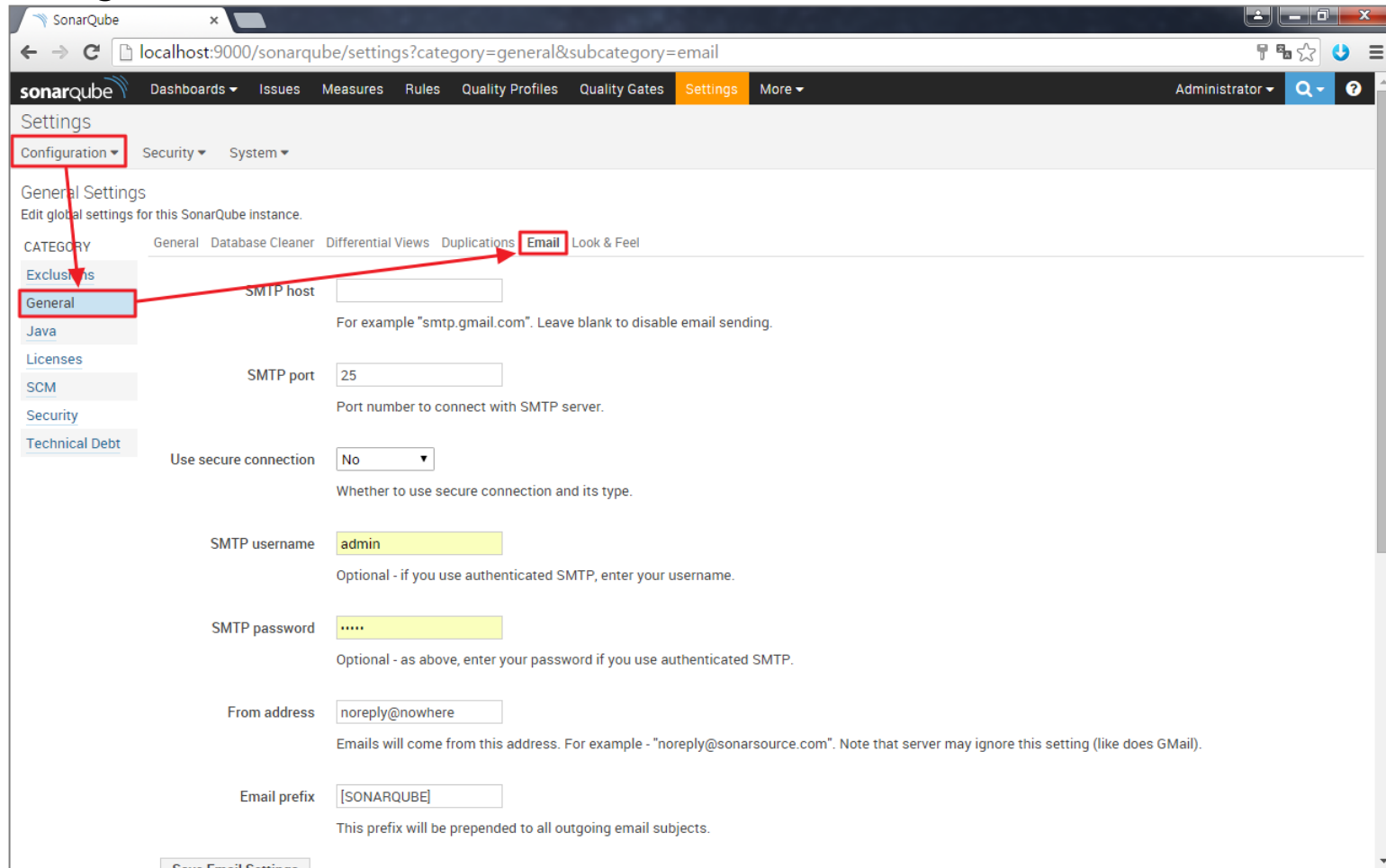
- 사용자 관리
  - 사용자 등록 및 삭제는 'Security' → 'Users' 메뉴 선택
  - > 오른쪽의 'Add new user'를 이용하여 사용자 추가 가능



# 3. 주요 기능

## 3.3 Sonar 환경 설정 (3/5)

- Email 서버 설정
  - Sonar는 smtp를 이용하여 사용자에게 이메일 수신 기능을 제공
  - > 'Configuration' → 'General' → 'Email' 메뉴에서 설정



The screenshot shows the SonarQube web interface at the URL `localhost:9000/sonarqube/settings?category=general&subcategory=email`. The 'Settings' menu is open, and the 'Email' subcategory is selected. The 'General' subcategory is also highlighted in the left sidebar. The 'Email' configuration section is visible, showing fields for SMTP host, SMTP port, SMTP username, SMTP password, From address, and Email prefix. The 'SMTP host' field is empty, and the 'SMTP port' is set to 25. The 'SMTP username' is set to 'admin', and the 'SMTP password' is masked with dots. The 'From address' is set to 'noreply@nowhere', and the 'Email prefix' is set to '[SONARQUBE]'. The 'Use secure connection' dropdown is set to 'No'.

Configuration

General Settings

Edit global settings for this SonarQube instance.

CATEGORY

General Database Cleaner Differential Views Duplications **Email** Look & Feel

Exclusions

**General**

Java

Licenses

SCM

Security

Technical Debt

SMTP host

For example "smtp.gmail.com". Leave blank to disable email sending.

SMTP port

25

Port number to connect with SMTP server.

Use secure connection

No

Whether to use secure connection and its type.

SMTP username

admin

Optional - if you use authenticated SMTP, enter your username.

SMTP password

.....

Optional - as above, enter your password if you use authenticated SMTP.

From address

noreply@nowhere

Emails will come from this address. For example - "noreply@sonarsource.com". Note that server may ignore this setting (like does GMail).

Email prefix

[SONARQUBE]

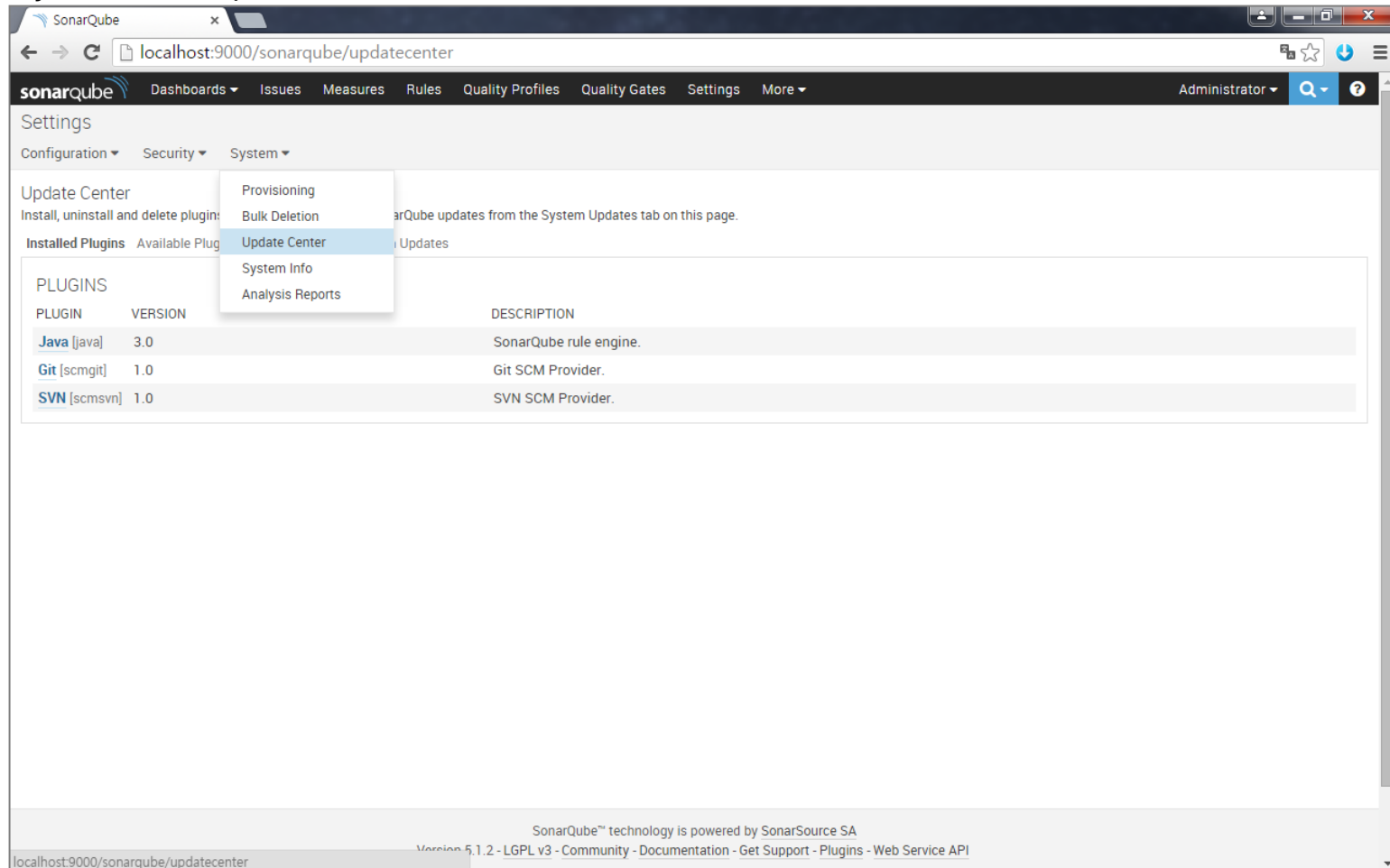
This prefix will be prepended to all outgoing email subjects.

Save Email Settings

# 3. 주요 기능

## 3.3 Sonar 환경 설정 (4/5)

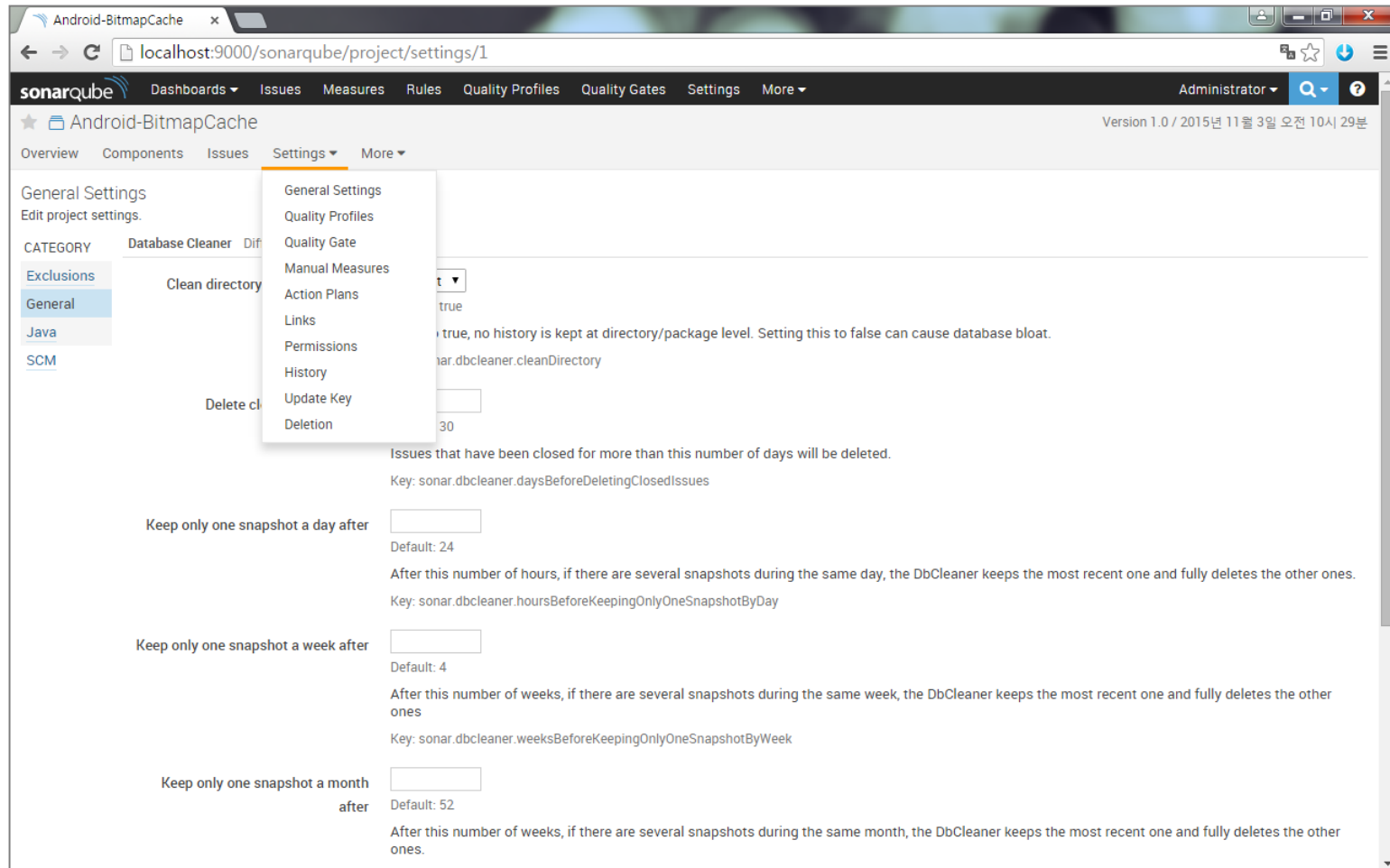
- Plug-in 관리
  - Sonar는 자체에서 Plug-in을 손쉽게 설치 및 관리하는 기능 제공
    - > 'System' → 'Update Center' 메뉴 선택



# 3. 주요 기능

## 3.3 Sonar 환경 설정 (5/5)

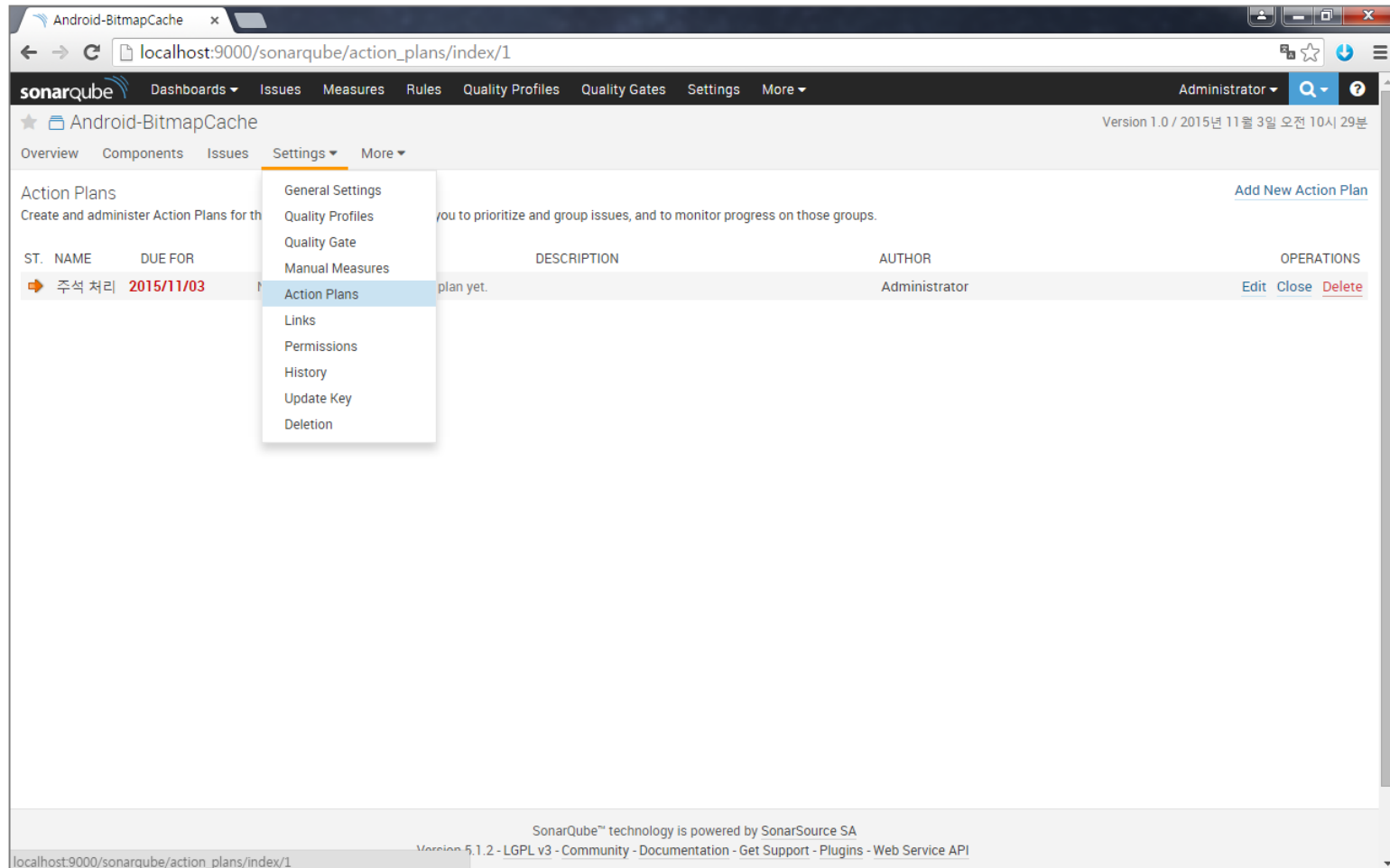
- 프로젝트 내 환경설정
  - 해당 프로젝트에서 상단의 'Settings' 메뉴에서 제공
    - > 프로젝트 내에서 분석 정도 및 다양한 항목에 대해 설정 가능



# 3. 주요 기능

## 3.4 계획 수립(1/2)

- Sonar는 이슈들을 계획으로 그룹화 하여 관리 가능
  - 프로젝트 내의 'Settings' → 'Action Plans' 선택
  - > 현재 계획들의 목록 및 진행사항을 볼 수 있음



Android-BitmapCache x

localhost:9000/sonarqube/action\_plans/index/1

sonarqube Dashboards Issues Measures Rules Quality Profiles Quality Gates Settings More Administrator

Android-BitmapCache Version 1.0 / 2015년 11월 3일 오전 10시 29분

Overview Components Issues Settings More

Action Plans

Create and administer Action Plans for the project. You can use them to prioritize and group issues, and to monitor progress on those groups.

[Add New Action Plan](#)

| ST | NAME  | DUE FOR    | DESCRIPTION | AUTHOR        | OPERATIONS                                                        |
|----|-------|------------|-------------|---------------|-------------------------------------------------------------------|
| 🔴  | 주석 처리 | 2015/11/03 | plan yet.   | Administrator | <a href="#">Edit</a> <a href="#">Close</a> <a href="#">Delete</a> |

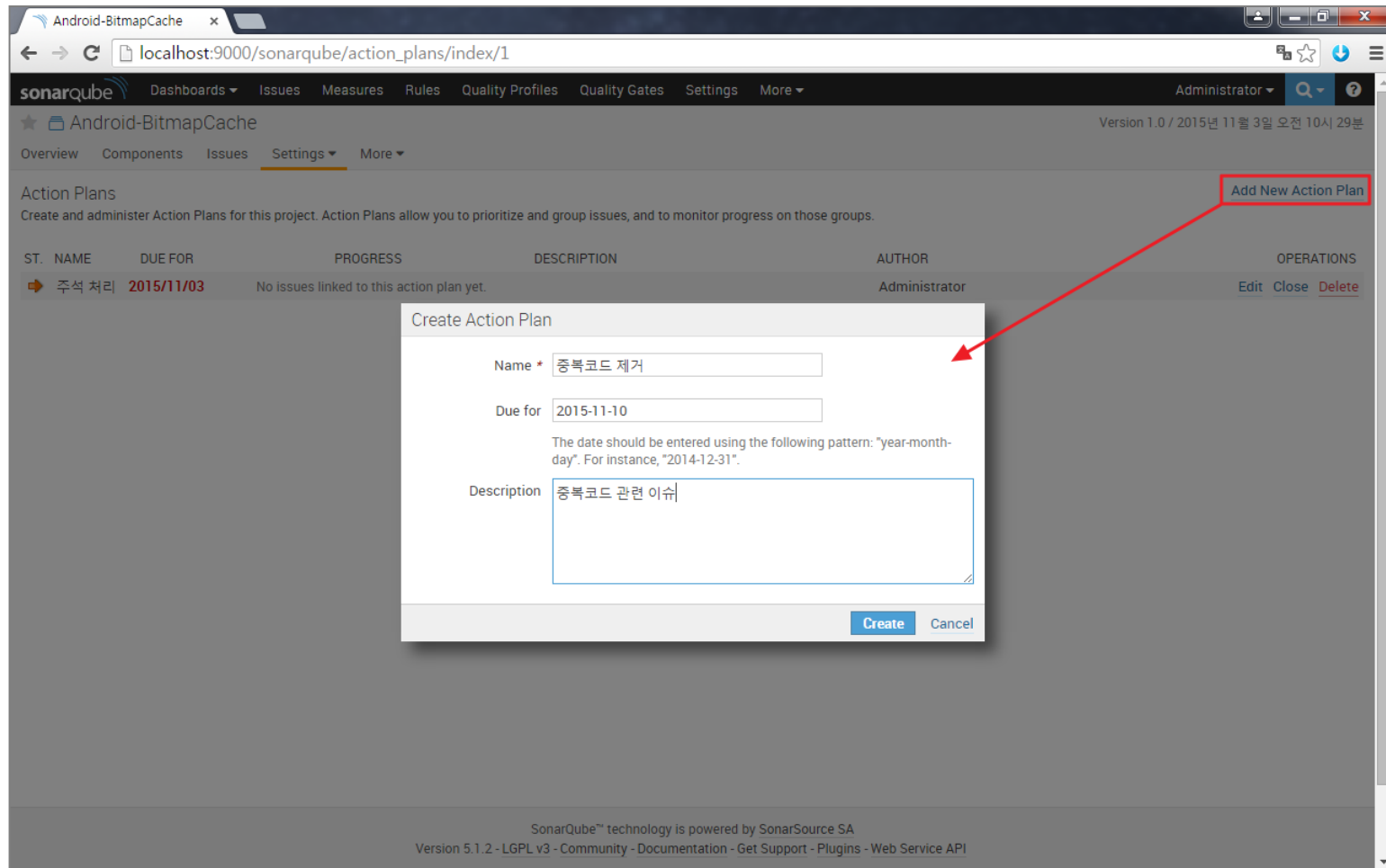
SonarQube™ technology is powered by SonarSource SA

localhost:9000/sonarqube/action\_plans/index/1 Version 5.1.2 - LGPL v3 - Community - Documentation - Get Support - Plugins - Web Service API

# 3. 주요 기능

## 3.4 계획 수립(2/2)

- 계획 추가
  - 오른쪽의 'Add New Action Plan' 을 클릭하여 항목을 채운 뒤 'Create' 클릭
  - > 새 계획이 추가됨



The screenshot shows the SonarQube web interface for the 'Android-BitmapCache' project. The 'Settings' tab is active, and the 'Action Plans' section is displayed. A red box highlights the 'Add New Action Plan' button in the top right corner. A red arrow points from this button to the 'Create Action Plan' dialog box. The dialog box contains the following fields:

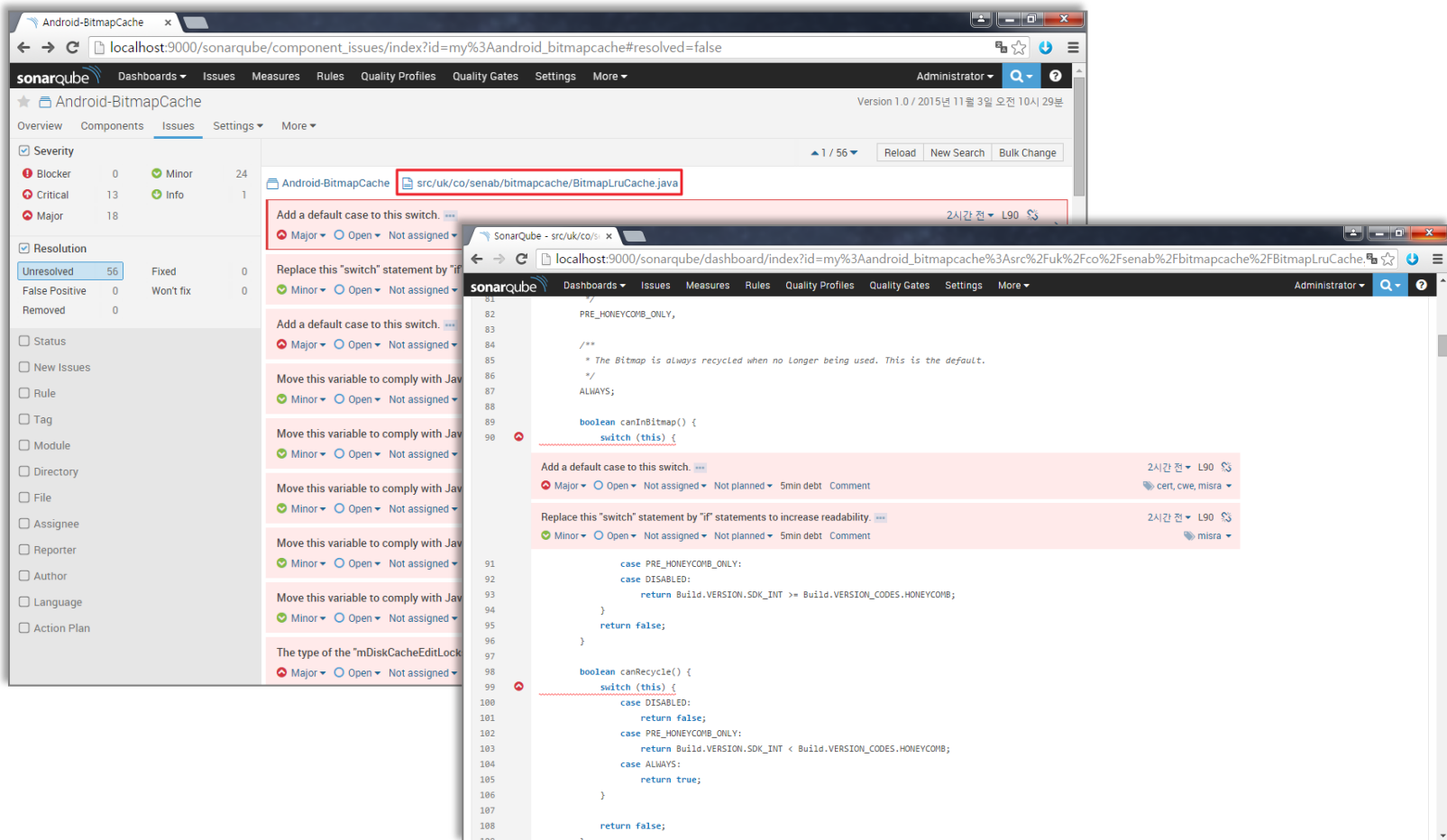
- Name: 중복코드 제거
- Due for: 2015-11-10
- Description: 중복코드 관련 이슈

The 'Create' button is highlighted in blue at the bottom right of the dialog box.

# 3. 주요 기능

## 3.5 이슈 관리 (1/5)

- 이슈 확인
  - Issues 페이지에서 분석된 소스 파일을 선택
    - > 해당 코드와 함께 문제점에 관한 내용을 보여줌



The screenshot displays the SonarQube web interface. The top navigation bar includes 'Dashboards', 'Issues', 'Measures', 'Rules', 'Quality Profiles', 'Quality Gates', 'Settings', and 'More'. The main content area shows the 'Issues' page for the 'Android-BitmapCache' component. A table on the left lists issues by severity: Blocker (0), Critical (13), Major (18), Minor (24), and Info (1). The 'Resolution' section shows 56 Unresolved issues. The 'Status' section shows 0 New Issues, 0 Rule, 0 Tag, 0 Module, 0 Directory, 0 File, 0 Assignee, 0 Reporter, 0 Author, 0 Language, and 0 Action Plan.

The issue details for 'src/uk/co/senab/bitmapcache/BitmapLruCache.java' are shown. The issue is a Major problem, 'Add a default case to this switch.', with a severity of 'Major' and a status of 'Open'. The issue is associated with the rule 'S1874' and has a '2시간 전' (2 hours ago) timestamp. The issue is assigned to 'cert, cwe, misra'.

The source code for 'BitmapLruCache.java' is displayed, showing a switch statement that handles different cases. The code is as follows:

```
81  
82 PRE_HONEYCOMB_ONLY,  
83  
84 /**  
85  * The Bitmap is always recycled when no Longer being used. This is the default.  
86  */  
87 ALWAYS;  
88  
89 boolean canInBitmap() {  
90     switch (this) {  
91  
92         case PRE_HONEYCOMB_ONLY:  
93             return Build.VERSION.SDK_INT >= Build.VERSION_CODES.HONEYCOMB;  
94         }  
95     }  
96  
97     return false;  
98  
99     boolean canRecycle() {  
100         switch (this) {  
101             case DISABLED:  
102                 return false;  
103             case PRE_HONEYCOMB_ONLY:  
104                 return Build.VERSION.SDK_INT < Build.VERSION_CODES.HONEYCOMB;  
105             case ALWAYS:  
106                 return true;  
107         }  
108     }  
109     return false;  
110 }
```

# 3. 주요 기능

## 3.5 이슈 관리 (2/5)

- 이슈 할당
  - 할당할 이슈에 중요도, 상태, 담당자, Action plan, Comment 등을 입력

The screenshot shows the SonarQube web interface in a browser. The address bar indicates the URL is `localhost:9000/sonarqube/dashboard/index?id=my%3Aandroid_bitmapcache%3Asrc%2Fuk%2Fsenab%2Fbitmapcache%2Fsrc%2Fmain%2Fjava%2Fcom%2Fsenab%2Fbitmapcache%2FBitmapCache.java`. The navigation bar includes links for Dashboards, Issues, Measures, Rules, Quality Profiles, Quality Gates, Settings, and More. The main content area displays a code review for a file named `BitmapCache.java`. The code snippet shows a `switch (this)` statement with a `case PRE_HONEYCOMB_ONLY:` block. A red squiggly line under the `switch (this)` statement indicates a code quality issue. The issue details are shown in a pink box, including the message "Add a default case to this switch. ...", the severity "Major", the status "Open", the assignee "Jisu Mo", the action plan "코드 추가 필요", and the effort "5min debt". The issue is also tagged with "L90" and "No tags". A comment by "Administrator" is visible, stating "default case 추가 필요". Another issue is shown below, with the message "Replace this 'switch' statement by 'if' statements to increase readability. ...", severity "Minor", status "Open", assignee "Not assigned", action plan "Not planned", and effort "5min debt". The issue is also tagged with "L90" and "misra".

# 3. 주요 기능

## 3.5 이슈 관리 (3/5)

- 할당 받은 이슈 확인
  - Issue 메뉴의 Assignee - Me 에서 자신에게 할당된 이슈를 확인할 수 있음
    - > 해당 제목을 클릭하면 상세 정보 확인가능

The screenshot shows the SonarQube web interface. The top navigation bar includes 'Dashboards', 'Issues', 'Measures', 'Rules', 'Quality Profiles', 'Quality Gates', and 'More'. The 'Issues' page is active, showing a list of issues for the component 'Android-BitmapCache'. The left sidebar has a filter for 'Assignee' set to 'Me', showing 4 issues. The main area displays a list of issues, including 'Remove this redundant "static" qualifier.' and 'Add a default case to this switch.'

| Severity | Count | Resolution | Count |
|----------|-------|------------|-------|
| Blocker  | 0     | Minor      | 1     |
| Critical | 0     | Info       | 0     |
| Major    | 3     |            |       |

| Status       | Count |
|--------------|-------|
| New Issues   |       |
| Rule         |       |
| Tag          |       |
| Module       |       |
| Directory    |       |
| File         |       |
| Assignee     | 4     |
| Me           | 4     |
| Not assigned | 53    |
| 김개발          | 4     |

| Issue Title                                                                 | Severity | Resolution | Count |
|-----------------------------------------------------------------------------|----------|------------|-------|
| Remove this redundant "static" qualifier.                                   | Major    | Confirmed  | 4     |
| Add a default case to this switch.                                          | Major    | Confirmed  | 4     |
| Replace this "switch" statement by "if" statements to increase readability. | Minor    | Open       | 4     |
| Add a default case to this switch.                                          | Major    | Open       | 4     |

# 3. 주요 기능

## 3.5 이슈 관리 (4/5)

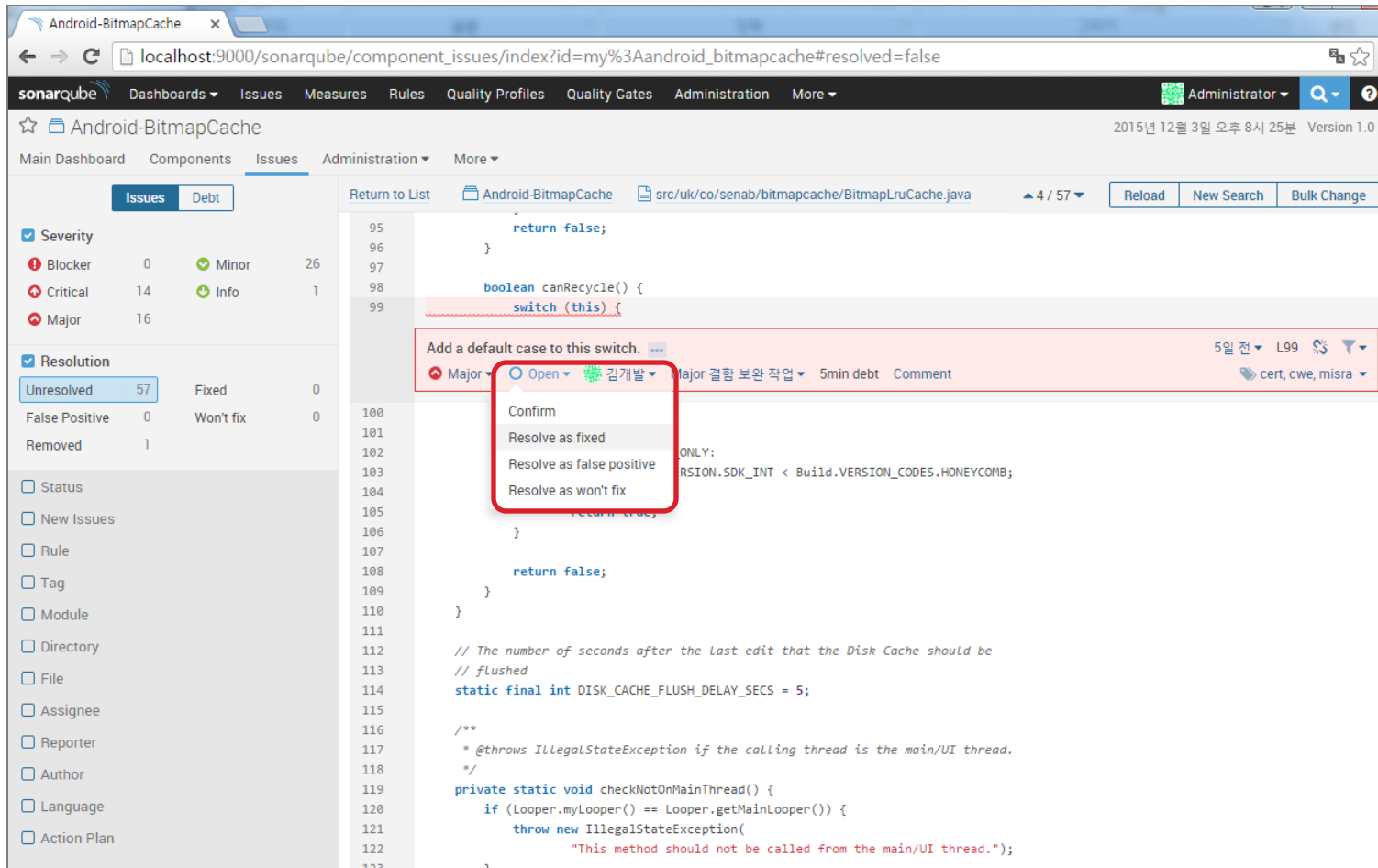
- 중요도 변경
  - Blocker, Critical, Major, Minor, Info 로 처리 중요도 수준을 변경할 수 있음

The screenshot shows the SonarQube web interface for the component 'Android-BitmapCache'. The 'Issues' tab is active, displaying a list of issues. A red box highlights the 'Severity' dropdown menu, which is open, showing options: Blocker, Critical, Major, Minor, and Info. The 'Major' option is selected. The issue details show a code snippet from 'src/uk/co/senab/bitmapcache/BitmapLruCache.java' with a switch statement. The issue is titled 'Add a default case to this switch.' and has a severity of 'Major'.

# 3. 주요 기능

## 3.5 이슈 관리 (5/5)

- 이슈 상태 변경
  - Confirm, Resolved as Fixed, Resolved as false positive, Resolve as won't fix 로 처리 결과에 따라 상태를 변경할 수 있음

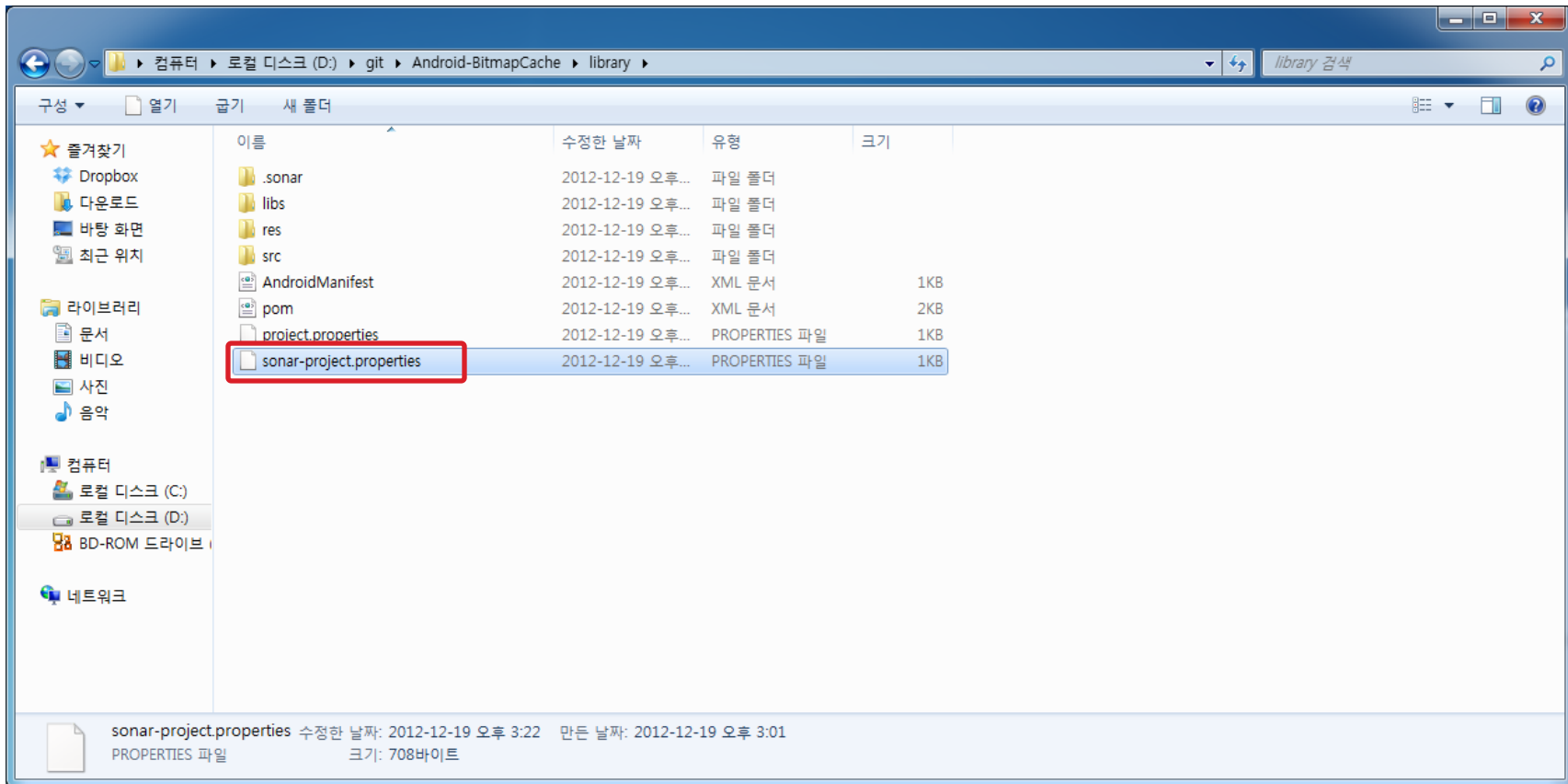


The screenshot shows the SonarQube web interface. The top navigation bar includes links for Dashboards, Issues, Measures, Rules, Quality Profiles, Quality Gates, Administration, and More. The main header shows the user is Administrator and the version is 1.0. The left sidebar contains filters for Severity (Blocker, Critical, Major, Minor, Info) and Resolution (Unresolved, Fixed, False Positive, Won't fix). The main content area displays a code editor for the file `src/uk/co/senab/bitmapcache/BitmapLruCache.java`. A red box highlights an issue in the code, and a dropdown menu is open showing options: Confirm, Resolve as fixed, Resolve as false positive, and Resolve as won't fix. The issue is labeled 'Major' and has a severity of 'Major'.

# 3. 주요 기능

## 3.6 Sonar runner 사용법 (1/4)

- Sonar runner 설정 파일생성
  - 분석하고자 하는 프로젝트 폴더에 "sonar-project.properties" 파일 생성
    - > 본 예제에서는 Adroid-BitmapCacheWlibrary 폴더에 생성



## 3.6 Sonar runner 사용법 (2/4)

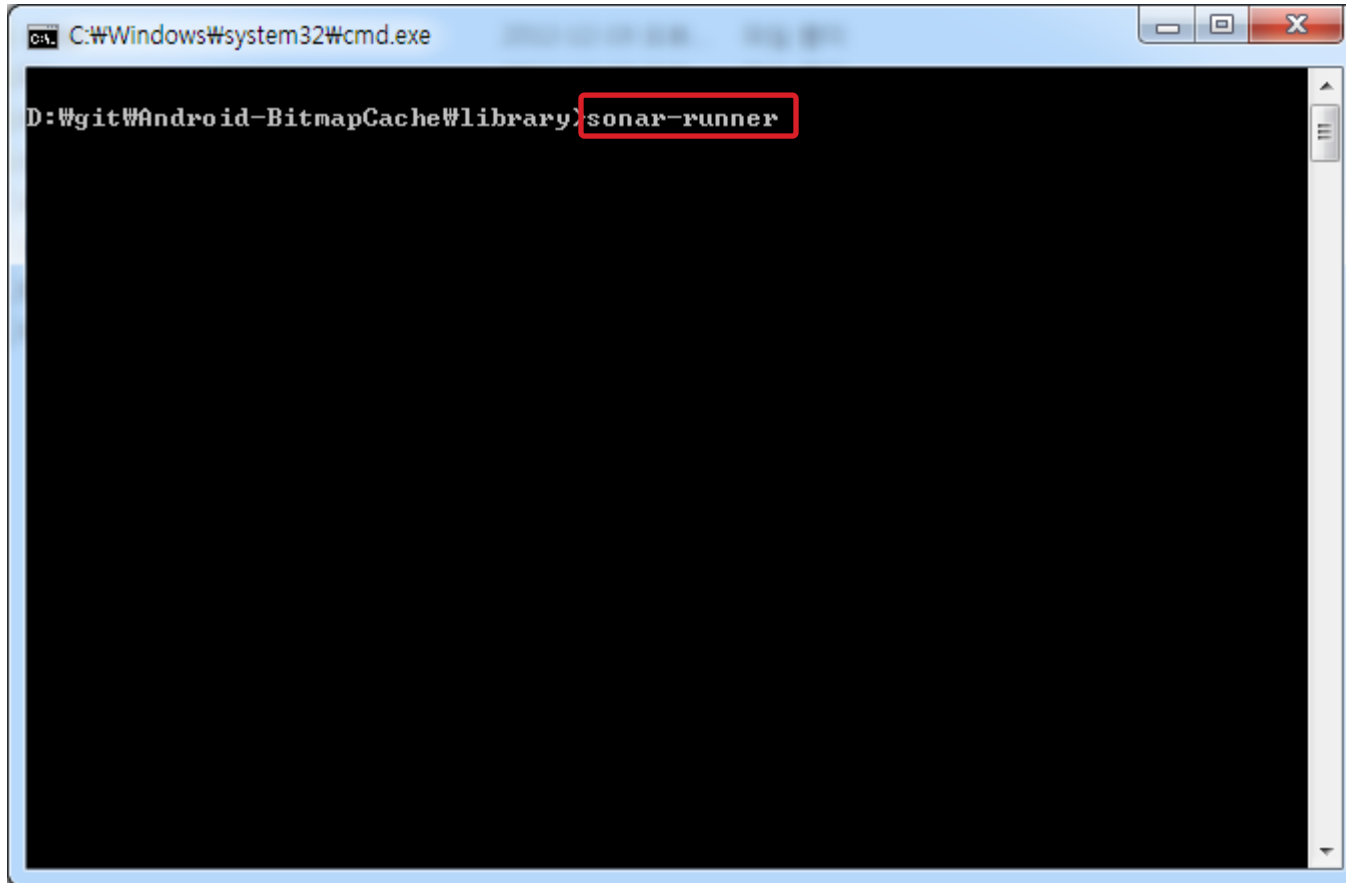
- sonar-project.properties 파일 내용
  - Project에 관한 Key, name, Version 내용
  - 실제 Source code가 포함되어 있는 곳
  - 테스트 코드 의 위치
  - 바이너리 파일의 위치
  - 라이브러리 파일 위치
  - 언어 종류
  - 추가 파라미터

```
1  # required metadata
2  sonar.projectKey=my:project
3  sonar.projectName=My project
4  sonar.projectVersion=1.0
5
6  # path to source directories (required)
7  sonar.sources=srcDir1,srcDir2
8
9  # path to test source directories (optional)
10 sonar.tests=testDir1,testDir2
11
12 # path to project binaries (optional), for example directory of Java bytecode
13 sonar.binaries=binDir
14
15 # optional comma-separated list of paths to libraries. Only path to JAR file and path to directory of classes are supported.
16 sonar.libraries=path/to/library.jar,path/to/classes/dir
17
18 # The value of the property must be the key of the language.
19 sonar.language=cobol
20
21 # Additional parameters
22 sonar.my.property=value
```

## 3. 주요 기능

### 3.6 Sonar runner 사용법 (3/4)

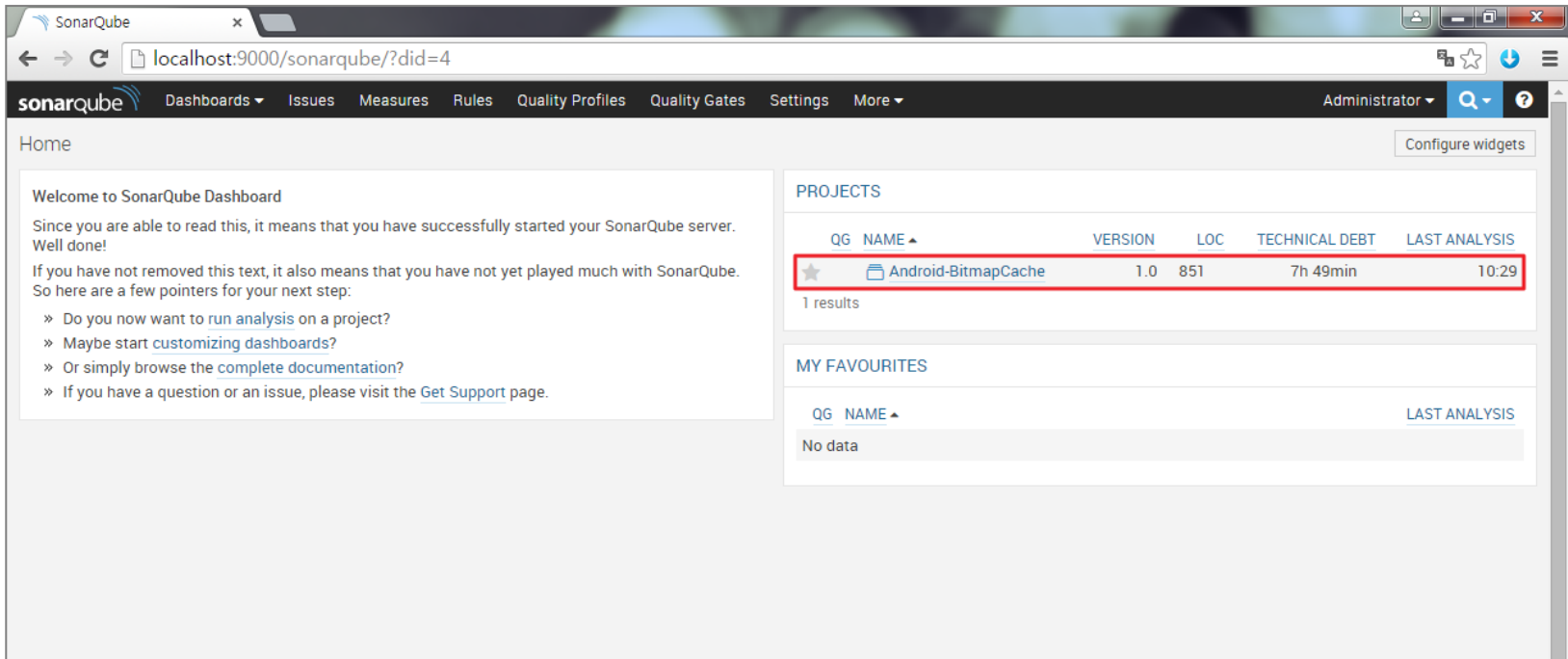
- 설정 파일을 작성 한 후, 커맨드 창에서 다음을 입력
  - sonar-runner



# 3. 주요 기능

## 3.6 Sonar runner 사용법 (4/4)

- 분석이 완료되면 Sonar 웹 페이지에서 확인 가능



The screenshot shows the SonarQube web interface in a browser window. The address bar shows 'localhost:9000/sonarqube/?did=4'. The navigation bar includes 'sonarqube', 'Dashboards', 'Issues', 'Measures', 'Rules', 'Quality Profiles', 'Quality Gates', 'Settings', and 'More'. The user is logged in as 'Administrator'. The main content area is titled 'Home' and contains a welcome message. On the right, there is a 'PROJECTS' section with a table of projects. The table has columns: 'QG', 'NAME', 'VERSION', 'LOC', 'TECHNICAL DEBT', and 'LAST ANALYSIS'. One project, 'Android-BitmapCache', is listed with version '1.0', '851' LOC, '7h 49min' technical debt, and '10:29' last analysis. This row is highlighted with a red box. Below the table, it says '1 results'. There is also a 'MY FAVOURITES' section which currently shows 'No data'.

| QG | NAME                | VERSION | LOC | TECHNICAL DEBT | LAST ANALYSIS |
|----|---------------------|---------|-----|----------------|---------------|
| ★  | Android-BitmapCache | 1.0     | 851 | 7h 49min       | 10:29         |

# 3. 주요 기능

## 3.7 주요 추가 기능

- Technical debt 계산 방법 변경
  - Technical debt plugin 대신 SQALE plugin을 SonarQube Core에 내장하여 계산 방식 변경
    - > Technical debt는 어떤 기능을 빨리 개발할 목적으로 잘 설계하지 않고 개발했을때, 결국 나중에는 문제해결을 위해 설계부터 다시 하게되는데, 이에 소요되는 예상 비용을 Technical debt라 한다.
    - > <http://martinfowler.com/bliki/TechnicalDebt.html> 참조

| Debt     | Issues |            |    |
|----------|--------|------------|----|
| 7h 49min | 56     | ! Blocker  | 0  |
|          |        | ↑ Critical | 13 |
|          |        | ↑ Major    | 18 |
|          |        | ✓ Minor    | 24 |
|          |        | ↓ Info     | 1  |

18 

`class Constants {`

Add a private constructor to hide the implicit public one. ...

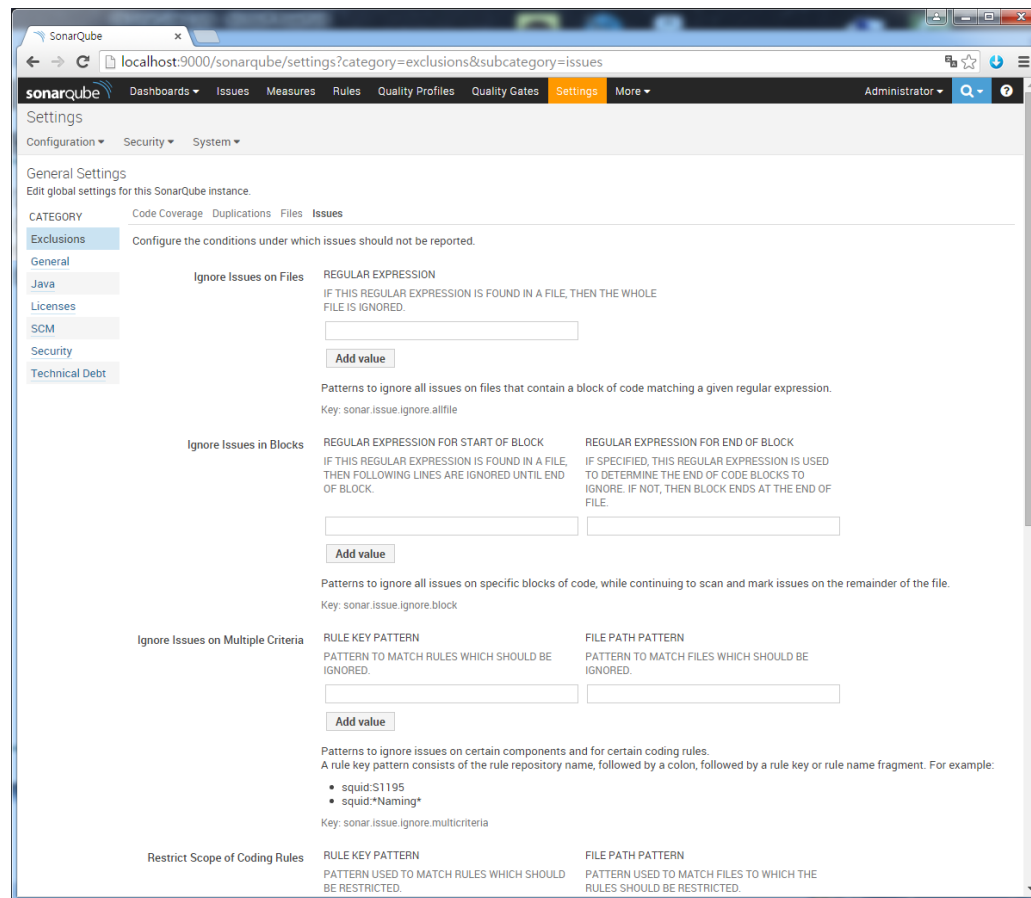
2시간 전 ▾ L18 

 Major  Open ▾ Not assigned ▾ Not planned ▾ 30min debt Comment  design ▾

# 3. 주요 기능

## 3.7 주요 추가 기능

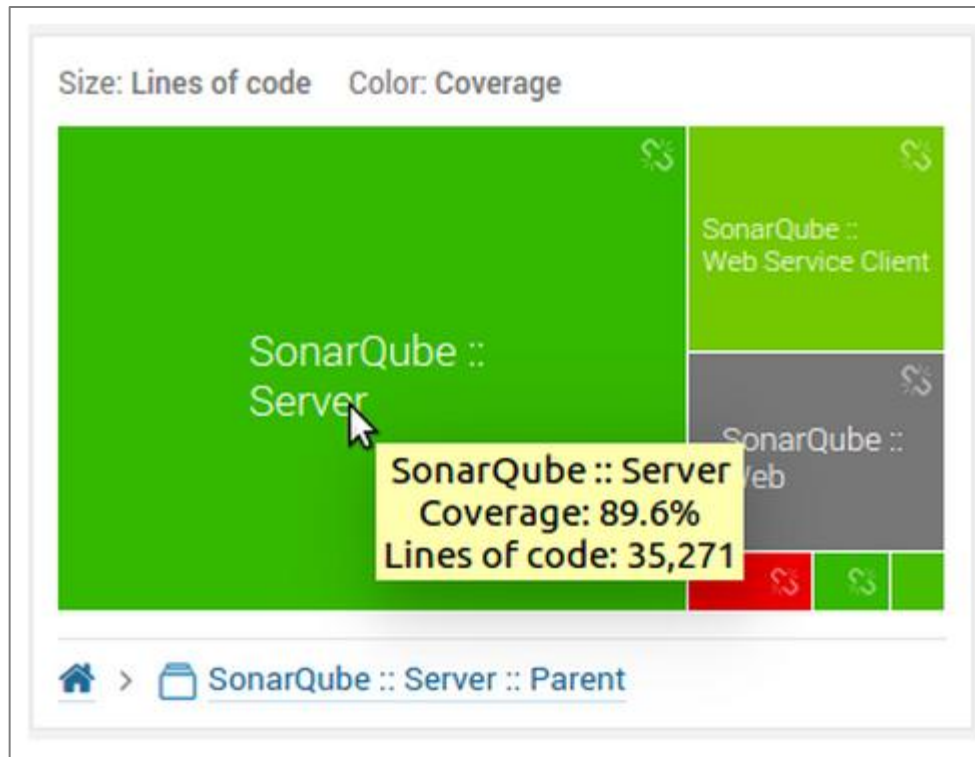
- 이슈 제외/포함, Code Coverage 제외 통합
  - 이슈 제외, Code Coverage 제외를 Switch off violations plugin를 통해 해결하지 않고 SonarQube에 통합
  - > 모든 제외를 하나의 화면에서 관리



## 3. 주요 기능

### 3.7 주요 추가 기능

- Treemap 개선
  - JavaScript로 전면 재작성되어 더 직관적이고 반응형 방식으로 표시

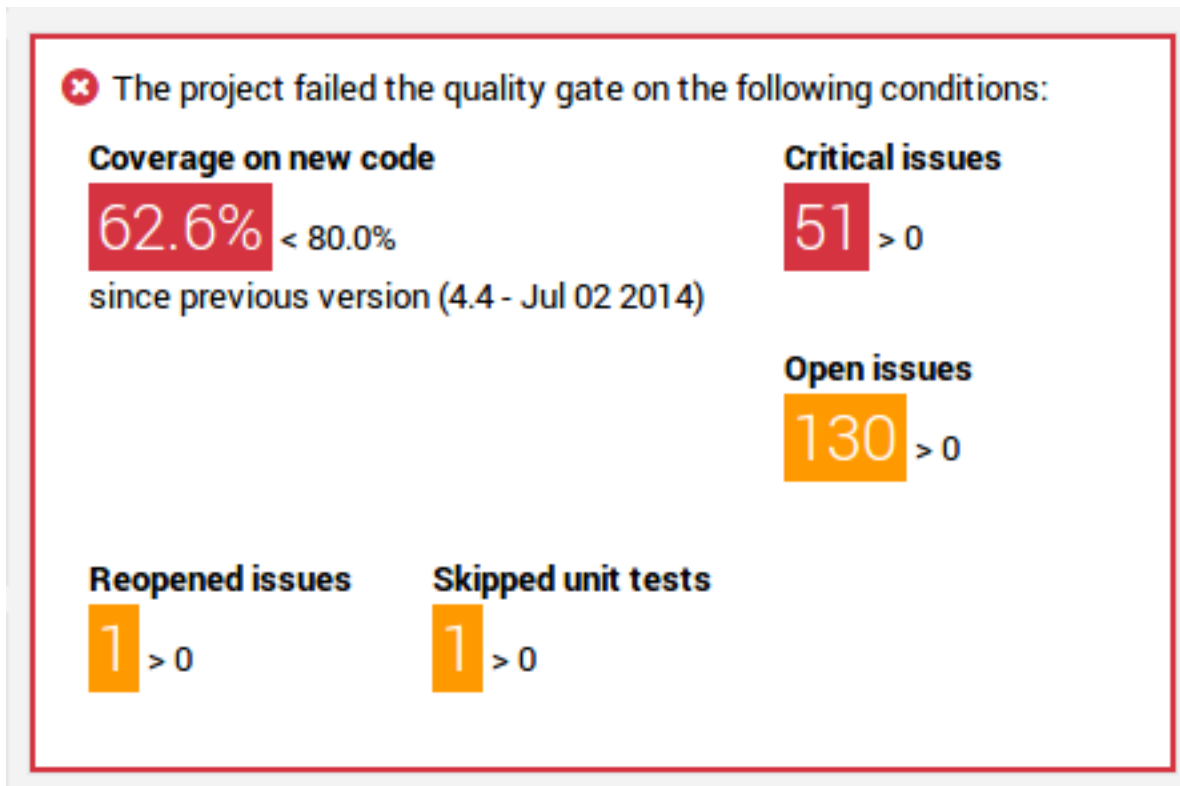


## 3. 주요 기능

### 3.7 주요 추가 기능

---

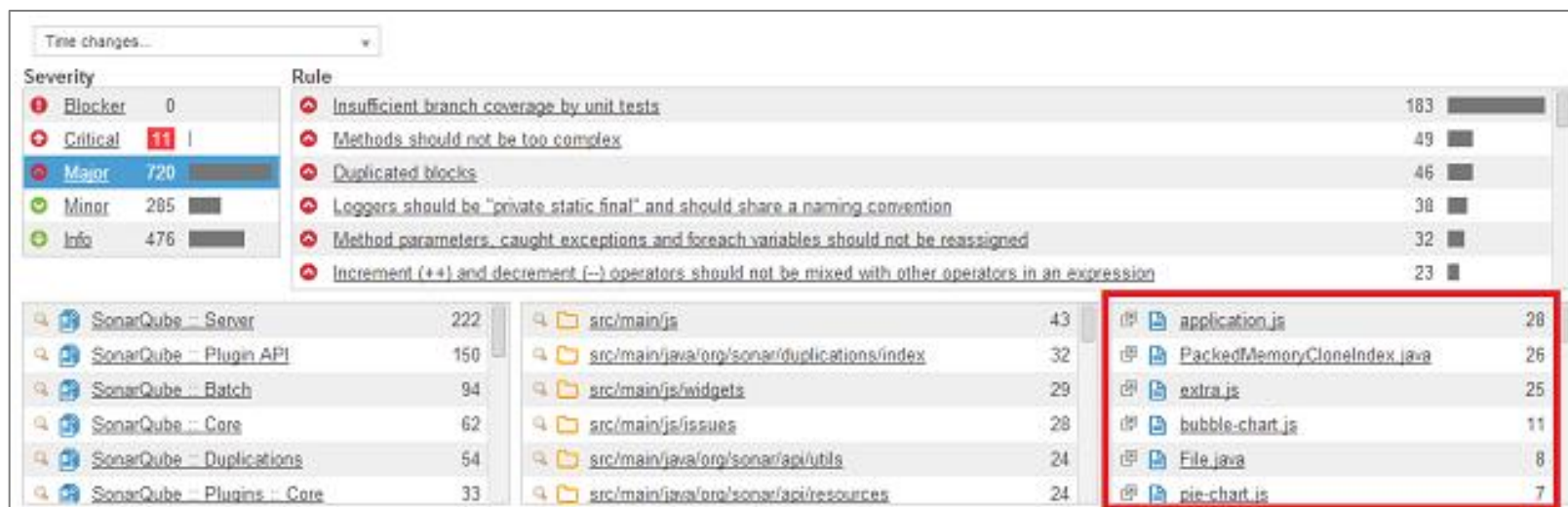
- Quality Gate 위젯
  - 프로젝트가 일정 수준을 통과하지 못했을 때 문제점을 한 번에 보여주는 Quality Gate 위젯



# 3. 주요 기능

## 3.7 주요 추가 기능

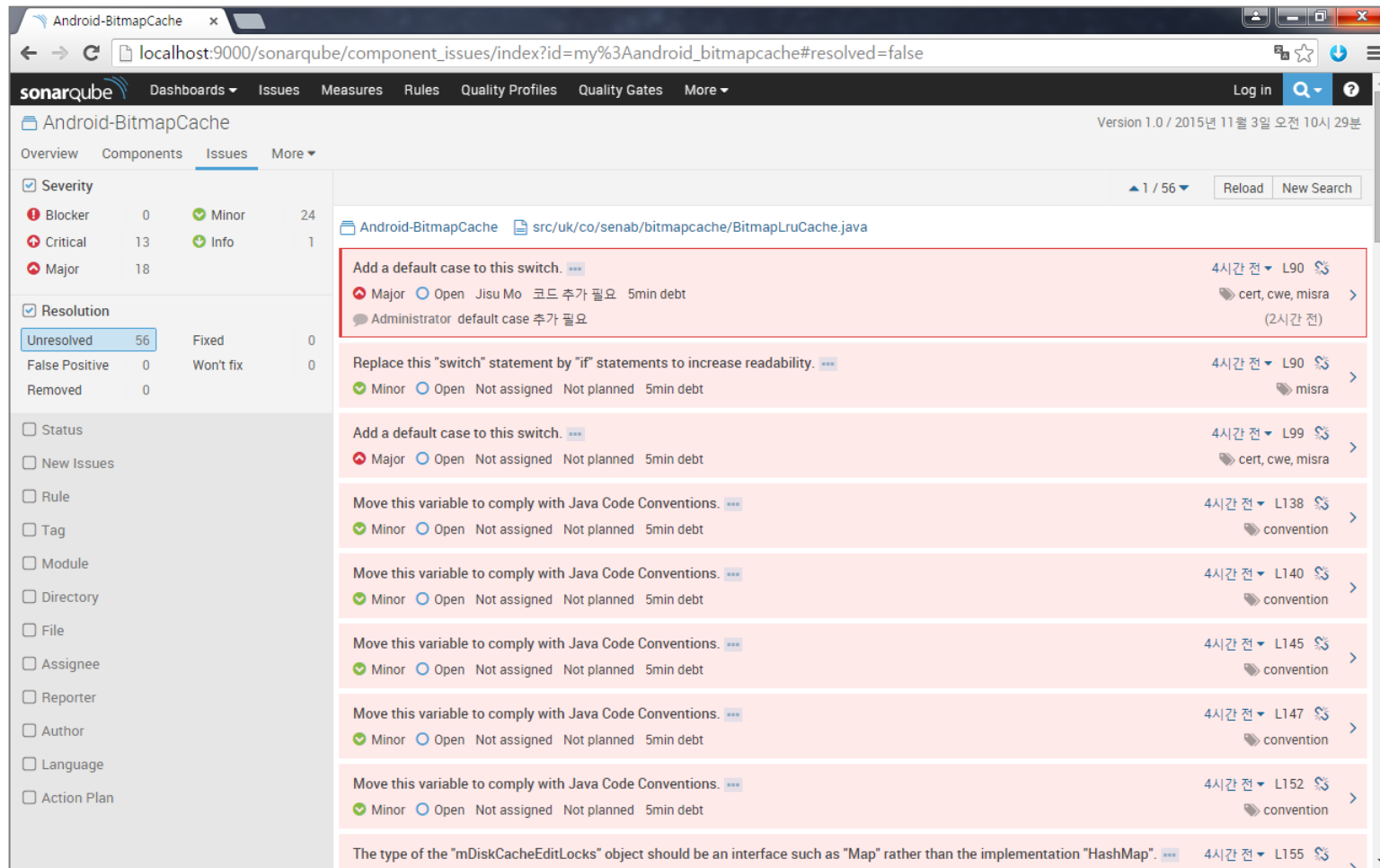
- 다중 언어 분석
  - 여러 종류의 언어로 작성된 소스 코드가 있는 프로젝트의 부모 폴더를 클릭하면, 하위에 있는 파일의 종류와 관계없이 모두에 대한 분석 자료 표시



# 3. 주요 기능

## 3.7 주요 추가 기능

- 이슈 페이지 개선
  - 이슈를 검색하고 확인하기 쉽도록 이슈 페이지 개선



The screenshot shows the SonarQube web interface for the 'Android-BitmapCache' component. The 'Issues' tab is active, displaying a list of issues. The left sidebar shows filters for Severity (Blocker, Critical, Major, Minor, Info) and Resolution (Unresolved, Fixed, False Positive, Removed). The main area shows a list of issues with details such as severity, resolution, and status. The issues are sorted by severity, with 'Major' issues at the top. The first issue is 'Add a default case to this switch.' with a severity of 'Major' and a resolution of 'Open'. The second issue is 'Replace this "switch" statement by "if" statements to increase readability.' with a severity of 'Minor' and a resolution of 'Open'. The third issue is 'Add a default case to this switch.' with a severity of 'Major' and a resolution of 'Open'. The fourth issue is 'Move this variable to comply with Java Code Conventions.' with a severity of 'Minor' and a resolution of 'Open'. The fifth issue is 'Move this variable to comply with Java Code Conventions.' with a severity of 'Minor' and a resolution of 'Open'. The sixth issue is 'Move this variable to comply with Java Code Conventions.' with a severity of 'Minor' and a resolution of 'Open'. The seventh issue is 'Move this variable to comply with Java Code Conventions.' with a severity of 'Minor' and a resolution of 'Open'. The eighth issue is 'Move this variable to comply with Java Code Conventions.' with a severity of 'Minor' and a resolution of 'Open'. The ninth issue is 'The type of the "mDiskCacheEditLocks" object should be an interface such as "Map" rather than the implementation "HashMap".' with a severity of 'Minor' and a resolution of 'Open'.

## 4. 활용 예제

### 세부 목차

---

- 4.1 예제 소개
- 4.2 Sonar-runner 사용
- 4.3 분석 결과 확인
- 4.4 사용자 등록
- 4.5 이슈 할당
- 4.6 이슈 확인

## 4. 활용 예제

### 4.1 예제 소개

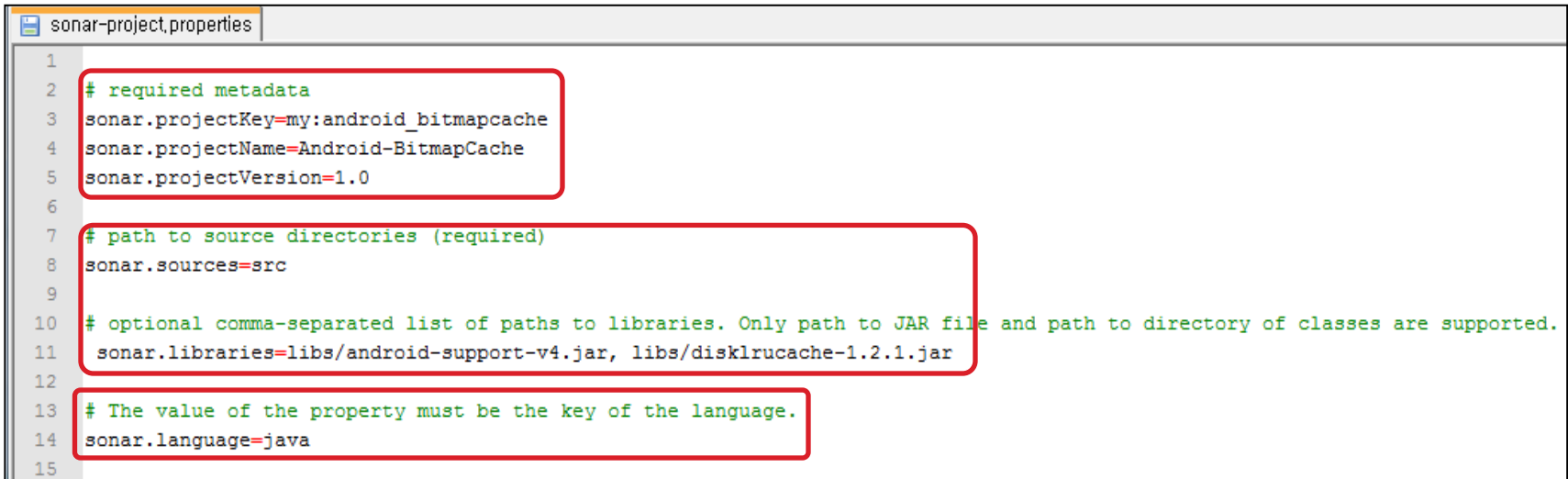
---

- Open Source인 Android-BitmapCache 프로젝트를 정적 분석
- Sonar 클라이언트는 Sonar-runner를 사용
- 문제점을 개발자에게 할당 및 해결
- 인원은 관리자 1명, 개발자 1명

## 4. 활용 예제

### 4.2 Sonar-runner 사용 (1/2)

- sonar-project.properties 파일 작성
  - ProjectKey : my:adnroid\_bitmapcache
  - ProjectName : Android-bitmapCache
  - ProjectVersion : 1.0
- 소스파일 및 라이브러리 파일 위치 지정
- 사용 언어는 Java

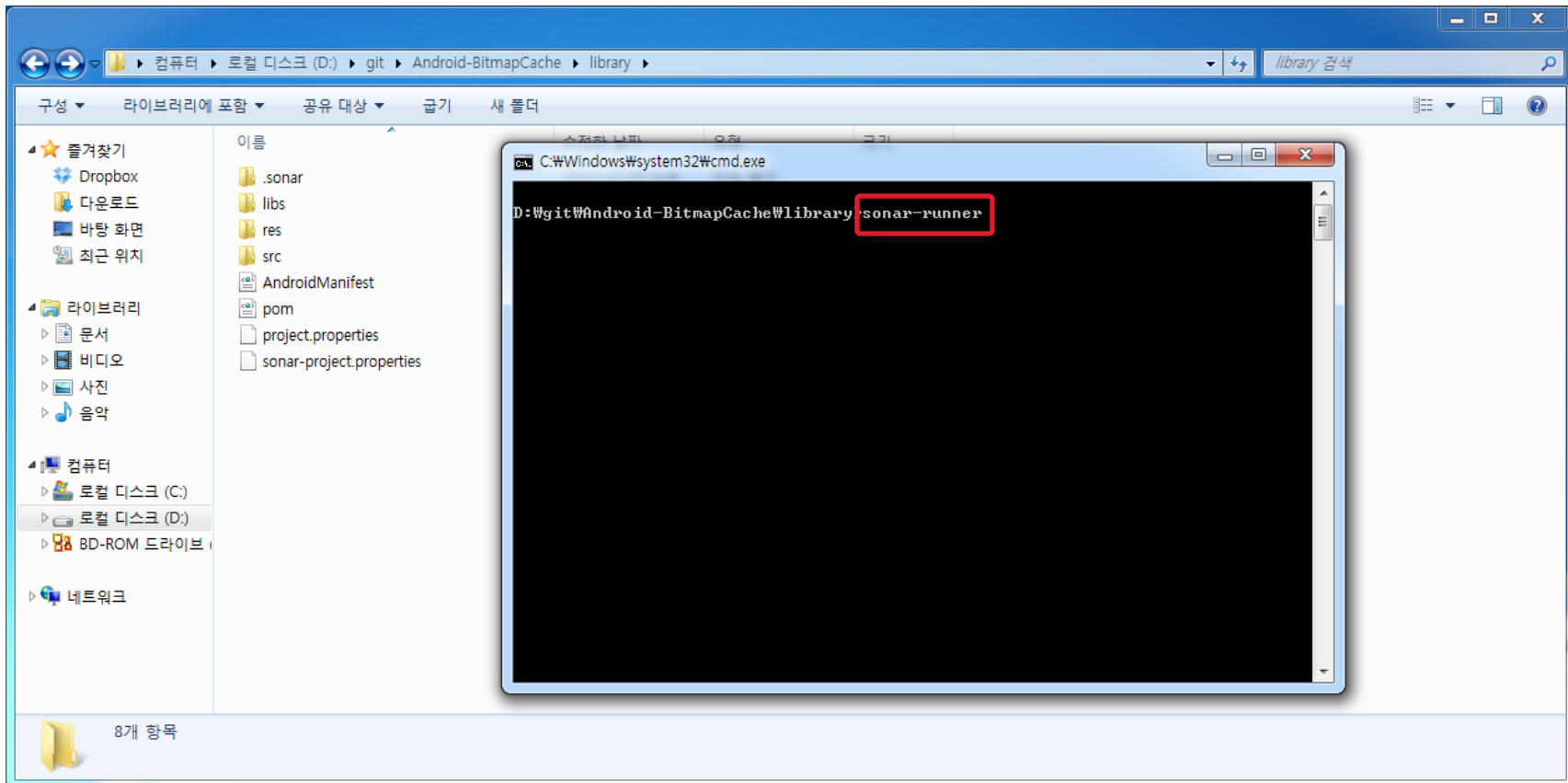


```
1
2 # required metadata
3 sonar.projectKey=my:android_bitmapcache
4 sonar.projectName=Android-BitmapCache
5 sonar.projectVersion=1.0
6
7 # path to source directories (required)
8 sonar.sources=src
9
10 # optional comma-separated list of paths to libraries. Only path to JAR file and path to directory of classes are supported.
11 sonar.libraries=libs/android-support-v4.jar, libs/disklrucache-1.2.1.jar
12
13 # The value of the property must be the key of the language.
14 sonar.language=java
15
```

## 4. 활용 예제

### 4.2 Sonar-runner 사용 (2/2)

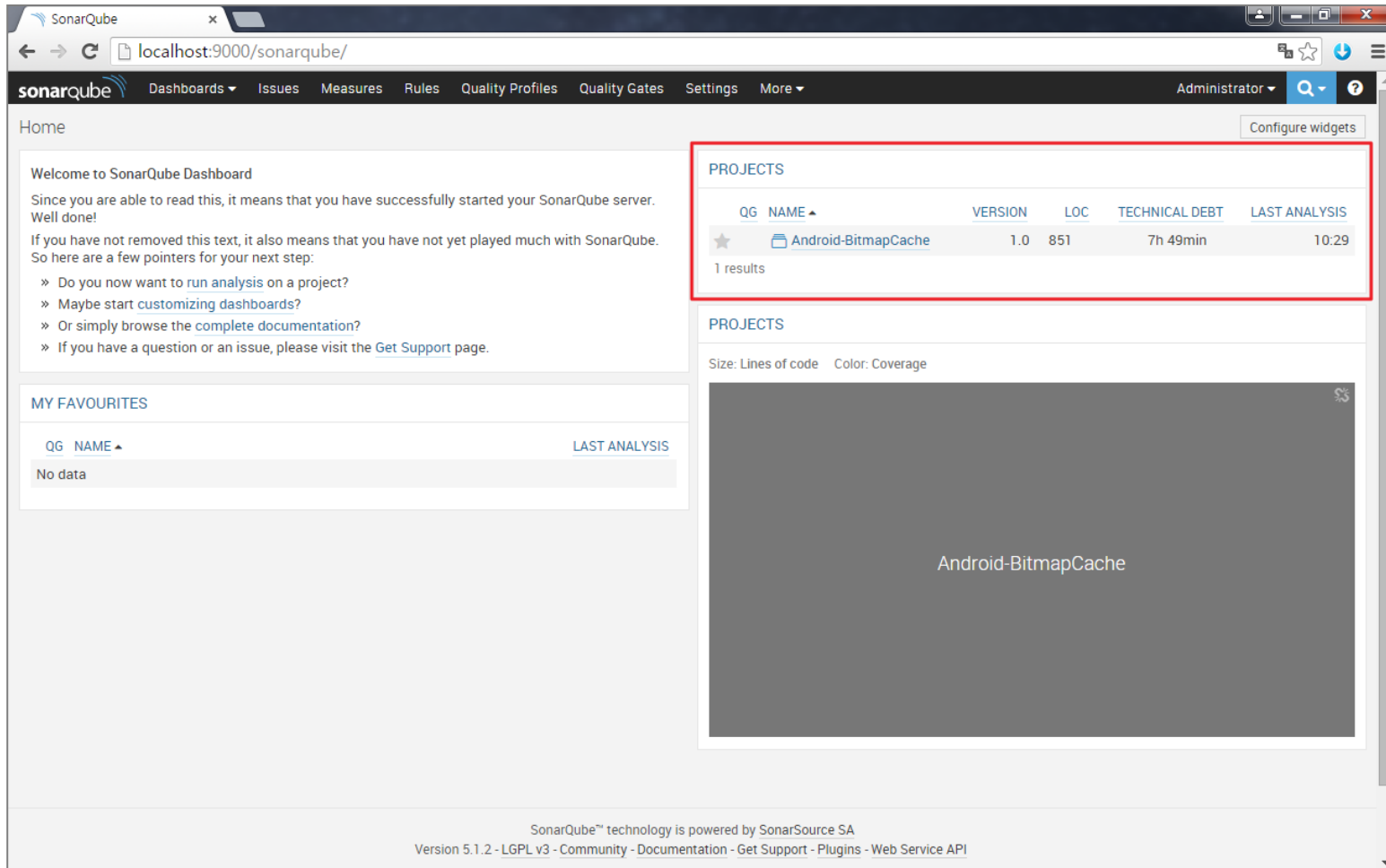
- Sonar-runner를 이용하여 분석 실행
  - 해당 폴더에서 커맨드창을 열어 다음 명령어 실행
    - > sonar-runner



## 4. 활용 예제

### 4.3 분석 결과 확인 (1/2)

- <http://localhost:9000/sonarqube> 으로 접속하여 프로젝트 생성 확인
  - Android-BitmapCache 프로젝트가 생성됨을 확인 가능



The screenshot shows the SonarQube web interface at [localhost:9000/sonarqube/](http://localhost:9000/sonarqube/). The top navigation bar includes links for Dashboards, Issues, Measures, Rules, Quality Profiles, Quality Gates, Settings, and More. The user is logged in as Administrator. The main content area is divided into two columns. The left column contains a 'Home' section with a welcome message and a 'MY FAVOURITES' section which is currently empty. The right column features a 'PROJECTS' widget, which is highlighted with a red box. This widget displays a table with the following data:

| QG | NAME                | VERSION | LOC | TECHNICAL DEBT | LAST ANALYSIS |
|----|---------------------|---------|-----|----------------|---------------|
| ★  | Android-BitmapCache | 1.0     | 851 | 7h 49min       | 10:29         |

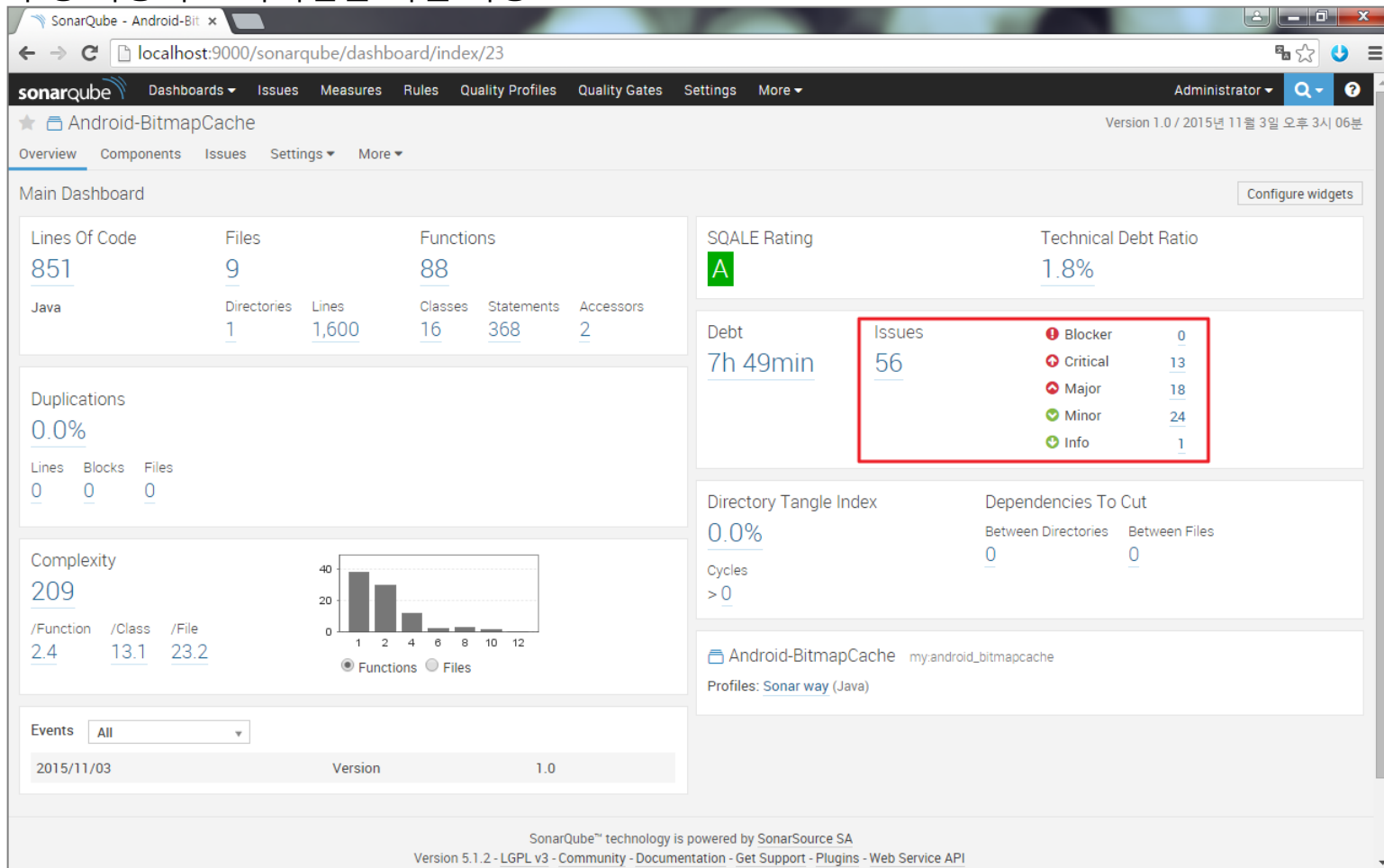
Below the table, it indicates '1 results'. Underneath the 'PROJECTS' widget, there is another section titled 'PROJECTS' with a 'Size: Lines of code' and 'Color: Coverage' filter. This section contains a large grey box with the text 'Android-BitmapCache'.

At the bottom of the page, the footer text reads: 'SonarQube™ technology is powered by SonarSource SA. Version 5.1.2 - LGPL v3 - Community - Documentation - Get Support - Plugins - Web Service API'.

# 4. 활용 예제

## 4.3 분석 결과 확인 (2/2)

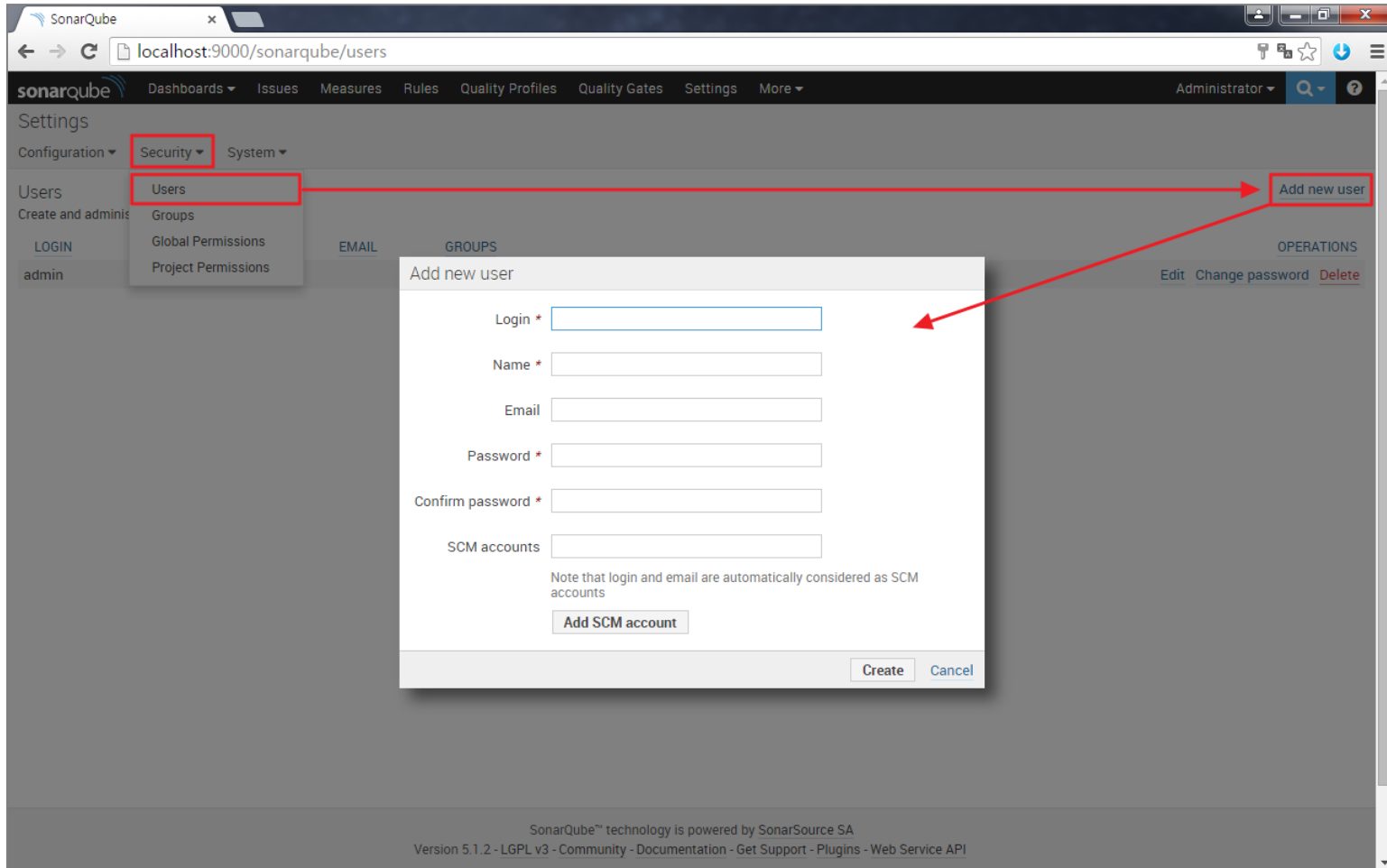
- 프로젝트 내 Dashboard 확인
  - 프로젝트의 검사 결과를 확인 할 수 있음
  - > 수정 사항이 56가지임을 확인 가능



# 4. 활용 예제

## 4.4 사용자 등록

- 사용자(개발자) 계정 등록
  - Settings → Security → Users 에서 등록



# 4. 활용 예제

## 4.5 이슈 할당 (1/3)

- Issues 메뉴에서 예시로 수정 사항 하나를 선택. 여기서 'Remove those useless parentheses' 를 선택. 오른쪽의 화살표를 눌러 세부 사항을 확인

The screenshot shows the SonarQube web interface for the component 'Android-BitmapCache'. The 'Issues' tab is active. The left sidebar contains filters for Severity and Resolution. The main content area displays a list of issues. The issue 'Remove those useless parentheses.' is highlighted with a red box, and its rightmost arrow icon is also highlighted with a red box, indicating it is the selected item for further details.

| Severity | Count |
|----------|-------|
| Blocker  | 0     |
| Critical | 13    |
| Major    | 18    |
| Minor    | 24    |
| Info     | 1     |

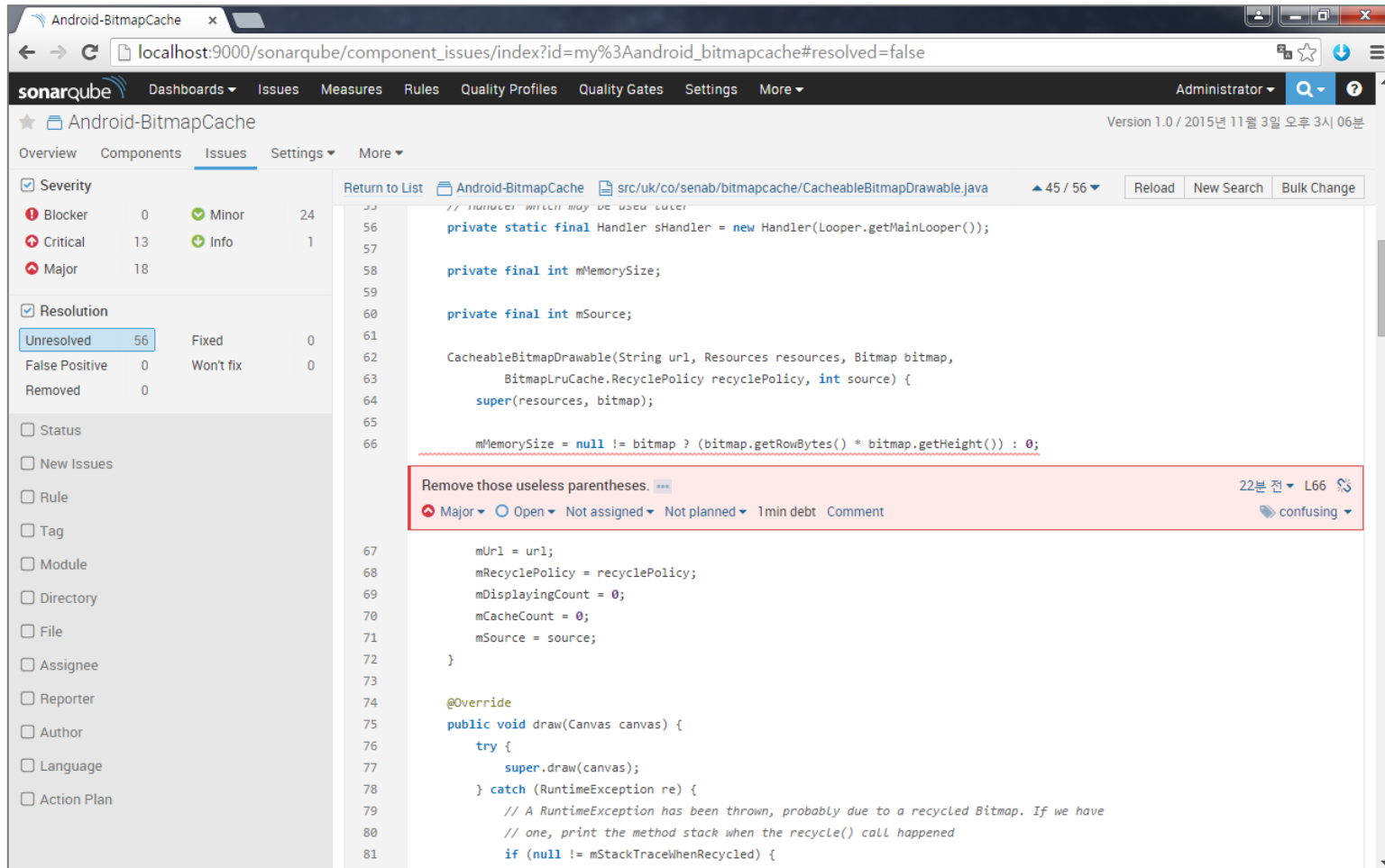
| Resolution     | Count |
|----------------|-------|
| Unresolved     | 56    |
| Fixed          | 0     |
| False Positive | 0     |
| Removed        | 0     |

| Issue Description                                                                                | Severity | Resolution | Assignee     | Planned     | Debt  | Comment | Tags    |                |
|--------------------------------------------------------------------------------------------------|----------|------------|--------------|-------------|-------|---------|---------|----------------|
| Add the "@Override" annotation above this method signature                                       | Major    | Open       | Not assigned | Not planned | 5min  | debt    | Comment | bad-practice   |
| Either log or rethrow this exception.                                                            | Critical | Open       | Not assigned | Not planned | 10min | debt    | Comment | error-handling |
| Use a logger to log this exception.                                                              | Critical | Open       | Not assigned | Not planned | 10min | debt    | Comment | error-handling |
| Remove those useless parentheses.                                                                | Major    | Open       | Not assigned | Not planned | 1min  | debt    | Comment | confusing      |
| Use a logger to log this exception.                                                              | Critical | Open       | Not assigned | Not planned | 10min | debt    | Comment | error-handling |
| The Cyclomatic Complexity of this method "checkState" is 11 which is greater than 10 authorized. | Major    | Open       | Not assigned | Not planned | 11min | debt    | Comment | brain-overload |
| Move this constructor to comply with Java Code Conventions.                                      | Minor    | Open       | Not assigned | Not planned | 5min  | debt    | Comment | convention     |
| Move this constructor to comply with Java Code Conventions.                                      | Minor    | Open       | Not assigned | Not planned | 5min  | debt    | Comment | convention     |

# 4. 활용 예제

## 4.5 이슈 할당 (2/3)

- 문제점 확인
  - 쓸모 없는 괄호가 사용되었음을 알 수 있다.



The screenshot shows the SonarQube web interface for a project named 'Android-BitmapCache'. The 'Issues' tab is selected, and a list of issues is shown on the left. The issue 'Remove those useless parentheses.' is highlighted. The issue is located in the file 'src/uk/co/senab/bitmapcache/CacheableBitmapDrawable.java' at line 66. The issue is marked as 'Major' and 'Unresolved'. The code snippet shows the initialization of 'mMemorySize' with a complex expression involving 'bitmap.getRowBytes()' and 'bitmap.getHeight()'. The issue is highlighted with a red box and a message 'Remove those useless parentheses.'

| Severity | Count | Resolution | Count |
|----------|-------|------------|-------|
| Blocker  | 0     | Minor      | 24    |
| Critical | 13    | Info       | 1     |
| Major    | 18    |            |       |

| Resolution     | Count | Fixed     | Count |
|----------------|-------|-----------|-------|
| Unresolved     | 56    | Fixed     | 0     |
| False Positive | 0     | Won't fix | 0     |
| Removed        | 0     |           |       |

Remove those useless parentheses. **Major** **Unresolved** **Not assigned** **Not planned** 1 min debt **Comment**

```
66 mMemorySize = null != bitmap ? (bitmap.getRowBytes() * bitmap.getHeight()) : 0;
```

# 4. 활용 예제

## 4.5 이슈 할당 (3/3)

- Assign을 선택하여 문제점을 개발자에게 할당

The screenshot shows the SonarQube web interface for the 'Android-BitmapCache' component. The 'Issues' tab is active, displaying a list of issues on the left and a code editor on the right. The issue list shows 56 unresolved issues. The code editor displays the source code for 'CacheableBitmapDrawable.java'. A red box highlights an issue at line 66, 'mMemorySize = null != bitmap ? (bitmap.getRowBytes() \* bitmap.getHeight()) : 0;'. A tooltip message says 'Remove those useless parentheses. ...'. Below the code, a dropdown menu is open, showing the 'Assign' button selected, with a search bar and a list of users including 'Jisu Mo'.

Android-BitmapCache

localhost:9000/sonarqube/component\_issues/index?id=my%3Aandroid\_bitmapcache#resolved=false

sonarqube Dashboards Issues Measures Rules Quality Profiles Quality Gates Settings More

Administrator Q ?

Version 1.0 / 2015년 11월 3일 오후 3시 06분

Android-BitmapCache

Overview Components Issues Settings More

Severity

|          |    |       |    |
|----------|----|-------|----|
| Blocker  | 0  | Minor | 24 |
| Critical | 13 | Info  | 1  |
| Major    | 18 |       |    |

Resolution

|                |    |           |   |
|----------------|----|-----------|---|
| Unresolved     | 56 | Fixed     | 0 |
| False Positive | 0  | Won't fix | 0 |
| Removed        | 0  |           |   |

Status

New Issues

Rule

Tag

Module

Directory

File

Assignee

Reporter

Author

Language

Action Plan

Return to List Android-BitmapCache src/uk/co/senab/bitmapcache/CacheableBitmapDrawable.java 45 / 56

Reload New Search Bulk Change

66 mMemorySize = null != bitmap ? (bitmap.getRowBytes() \* bitmap.getHeight()) : 0;

Remove those useless parentheses. ...

22분 전 L66

Major Open Not assigned Not planned 1min debt Comment

67 mUrl = url

68 mRecyclePo Jisu Mo

69 mDisplayin

70 mCacheCount = 0;

71 mSource = source;

72 }

73

74 @Override

75 public void draw(Canvas canvas) {

76 try {

77 super.draw(canvas);

78 } catch (RuntimeException re) {

79 // A RuntimeException has been thrown, probably due to a recycled Bitmap. If we have

80 // one, print the method stack when the recycle() call happened

81 if (null != mStackTraceWhenRecycled) {

# 4. 활용 예제

## 4.6 이슈 확인

- 앞서 생성한 계정으로 접속하여 할당된 이슈를 확인

The screenshot shows the SonarQube web interface for the 'Android-BitmapCache' component. The left sidebar contains filters for 'Issues' and 'Debt'. Under 'Severity', there are counts for Blocker (0), Critical (2), Major (1), Minor (0), and Info (0). Under 'Resolution', there are counts for Unresolved (3), Fixed (0), False Positive (0), and Removed (0). The 'Assignee' filter is highlighted with a red box, showing 'Me' with 3 issues. The main area displays three issues:

- Introduce a new variable instead of reusing the parameter "context".** (Major, Open, Jisoo Mo, Not planned, 5min debt, 5일 전, L167)
- Either log or rethrow this exception.** (Critical, Open, Jisoo Mo, Not planned, 10min debt, 5일 전, L200)
- Use a logger to log this exception.** (Critical, Open, Jisoo Mo, Not planned, 10min debt, 5일 전, L201)

At the bottom, there is a warning message: '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.'