

Description of the parameters selected from SonarQube Scan

The following Readme describe the representation of data collected by the multiple scans with SonarQube.

The complete results are edited for privacy purposes and for normalize the format of the fields.

The data are extracted by a JSON file requested by an HTTP query to the SonarQube server and then refactored in a table for a suitable management.

The information selected are:

- **Rule:** contains the code of the rule broken to generate the issue. The rules are represented as a string composed as "xxx:yyy" where the "xxx" represent the domain language, in this work we used only C language and so we found only rules for "c: or common-c:"; while the code "yyy" references the current rule: it could be a name or an alphanumerical code as S123. The numeric value and represent the key of the rules in the internal database. For a detailed explanation of the rule we can visit the site <https://rules.sonarsource.com> with the complete list of all the rules. To quickly find the single rule we can query directly the URL <https://rules.sonarsource.com/c/RSPEC-123> with the current rule numeric code.
- **Type of Issue:** classified the issues based on the SonarQube convention. The possible values are:
 - o *BUG*: for issue that impact the reliability of the system,
 - o *SMELL_CODE*: for issue that impact the maintainability and the readability of the code,
 - o *VULNERABILITIES*: for issue that could impact the security of the system.
- **Severity of Issue:** classified the degree of the impact for an issue on the characteristics of the system. The possible values, ordered from the least to greatest, are:
 - o *INFO*: neither a bug nor a quality flaw, just a finding that could interferes with code readability,
 - o *MINOR*: represent a quality flaw which can slightly impact the developer productivity,
 - o *MAJOR*: represent a quality flaw which can highly impact the developer productivity,
 - o *CRITICAL*: a bug with a low probability to impact the behavior of the application in production or an issue which represents a security flaw and must be immediately reviewed,
 - o *BLOCKER*: define a bug with a high probability to impact the behavior of the application in production. The code must be immediately fixed.
- **Status:** contains information about the issue lifecycle. The possible values are:
 - o *OPEN*: set by SonarQube on new issues to be resolved,
 - o *CONFIRMED*: set manually to indicate that the issue is valid and not a false positive,
 - o *RESOLVED*: set manually to indicate that the next analysis should Close the issue,
 - o *REOPENED*: set automatically by SonarQube when a Resolved issue hasn't actually been corrected,
 - o *CLOSED*: set automatically by SonarQube for automatically created issues.

In this work the only status available and considered are OPEN, RESOLVED and CLOSED.

- **Comment Message:** contains the comment created by scanner with information of the rule broken on the current section of code. Explain in the issue in a more descriptive way.
- **Effort Estimated:** contains the period of time in minutes estimated for remediate the broken rule. This field is derived from the export in order to normalize the format of the time.
- **Version of Scan:** contains a string to define the version of the code that have been scanned. The possible values are:
 - o *Alpha_1.1*: first version of the code defined as Alpha_1 with date 20/11/2020,
 - o *Alpha_1.2*: second version of the Alpha_1 with date 23/11/2020,
 - o *Alpha_1.3*: third and release version of code Alpha_1 with date 12/01/2021,
 - o *Alpha_2.1*: first version of the code defined as Alpha_2 with date 06/04/2021,
 - o *Alpha_2.2*: second version of the Alpha_2 with date 09/04/2021,
 - o *Alpha_2.3*: third and release version of code Alpha_2 with date 23/04/2021.

Rule	Type of Issue	Severity of Issue	Status	Comment Message	Effort Estimated	Version of Scan
c:CommentedCode	CODE_SMELL	MAJOR	OPEN	Remove the commented-out code.	5	Alpha_1.1
c:S1135	CODE_SMELL	INFO	OPEN	Complete the task associated to This "TODO" comment.	0	Alpha_1.2
c:S5350	CODE_SMELL	MINOR	CLOSED	Make the type of This variable a pointer-to-const. The current type of "pKR_keyRel" Is "Key_Relation_t *".	2	Alpha_1.2
c:S860	BUG	MAJOR	OPEN	cast to 'gnutls_transport_ptr_t' (aka 'void *') from smaller integer type 'TCP_REMOTE_CEPID_T' (aka 'unsigned int')	20	Alpha_2.1