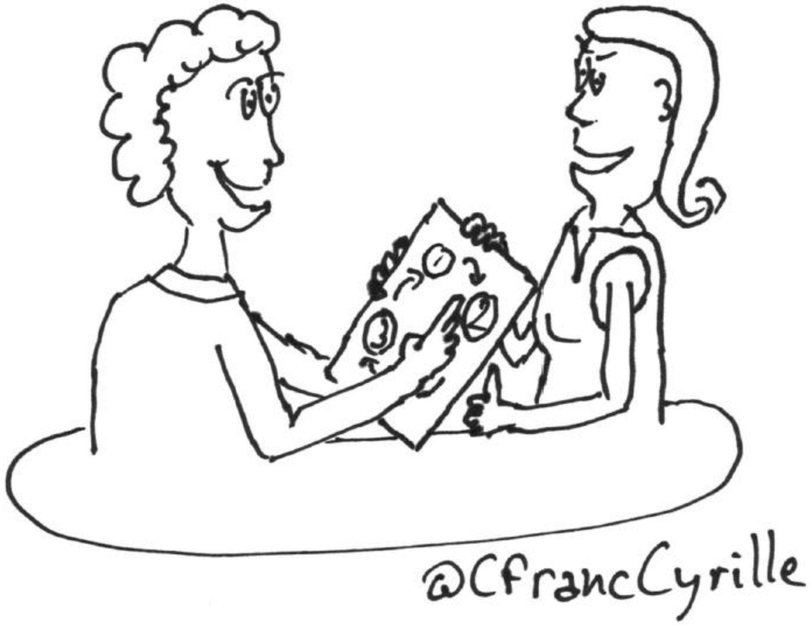
PLUGIN SONAR FRAMA-C

SONAR PLUGIN FOR THE CODE ANALYSIS TOOL: FRAMA-C

GET STARTED WITH SONAR PLUGIN FRAMA-C

- Sonar Server (OPS)
  - VirtualBox and VMs
  - Sonar configuration
  - Deploy & run
- Development environment (DEV)
  - Java JdK
  - Eclipse

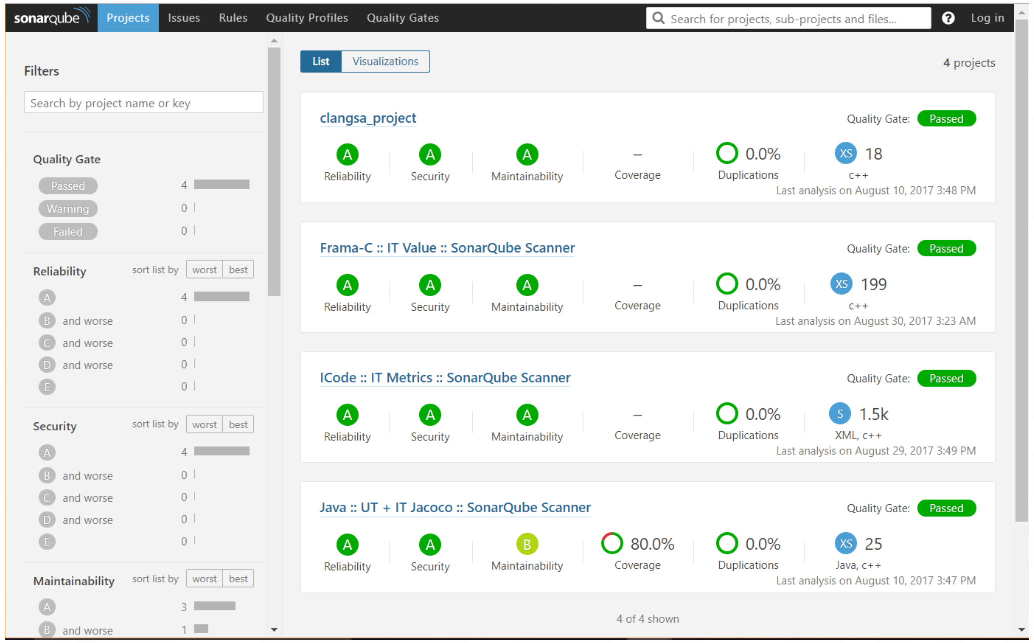


PLUGIN ARCHITECTURE

- languages: Specific Plug-in language
- measures: Metrics and computed measures definitions
- report: Parse a Frama-C output report
- rules: Frama-C rules definition
- sensor: Sensor executed by sonar-scanner into Frama-C projects
- settings: Plug-in preference

PREPARE FRAMA-C PROJECT

- Source files:
  - File name: *.c, *.i
- Sonar.properties
- Report directory:/oracle
- Report files:
  - Into the report directory
  - Same name as source file



Quality Gate	
Passed	4
Warning	0
Failed	0

Reliability (sort list by worst best)	
A	4
B and worse	0
C and worse	0
D and worse	0
E	0

Security (sort list by worst best)	
A	4
B and worse	0
C and worse	0
D and worse	0
E	0

Maintainability (sort list by worst best)	
A	3
B and worse	1

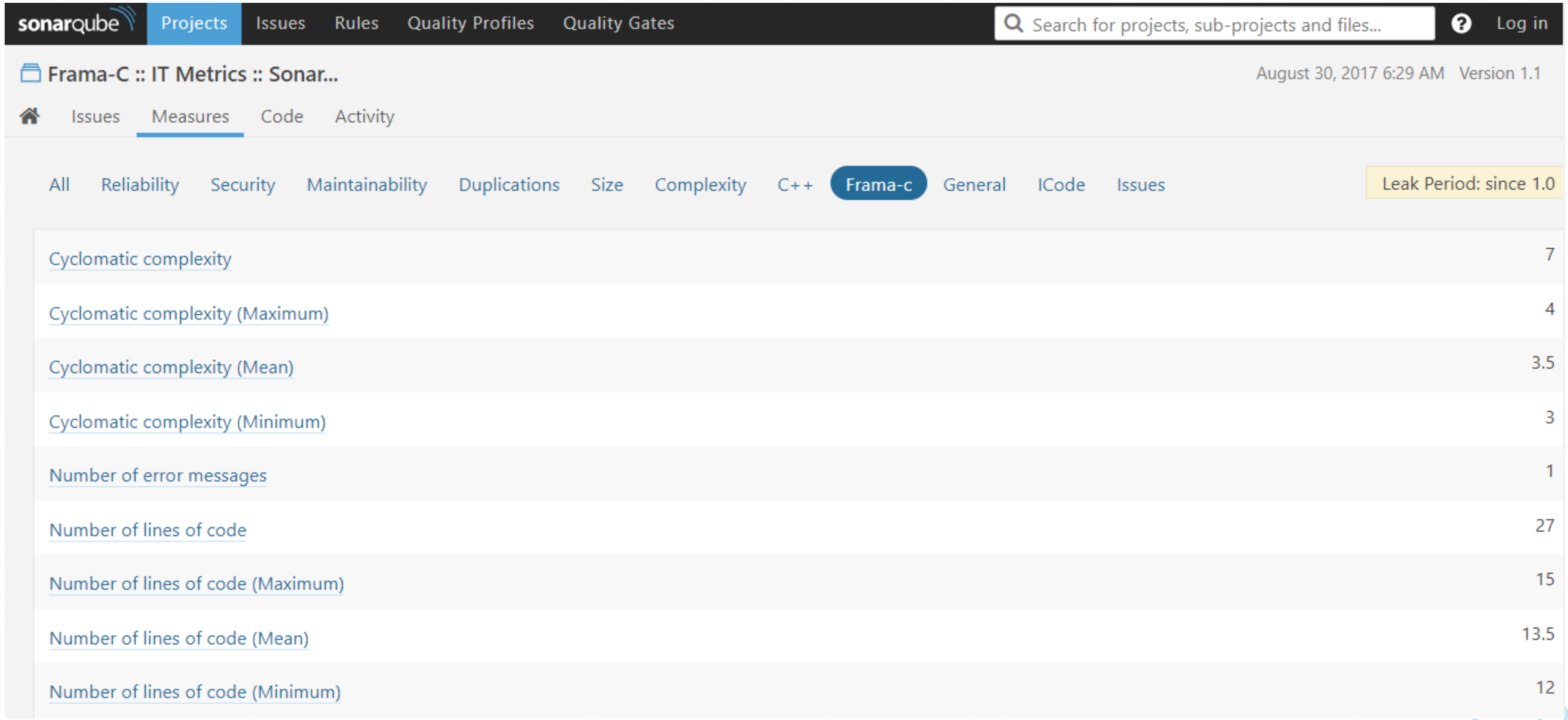
4 projects

Project	Quality Gate	Reliability	Security	Maintainability	Coverage	Duplications	Size	Last analysis
clangsa_project	Passed	A	A	A	–	0.0%	XS 18 c++	Last analysis on August 10, 2017 3:48 PM
Frama-C :: IT Value :: SonarQube Scanner	Passed	A	A	A	–	0.0%	XS 199 c++	Last analysis on August 30, 2017 3:23 AM
ICode :: IT Metrics :: SonarQube Scanner	Passed	A	A	A	–	0.0%	S 1.5k XML, c++	Last analysis on August 29, 2017 3:49 PM
Java :: UT + IT Jacoco :: SonarQube Scanner	Passed	A	A	B	80.0%	0.0%	XS 25 Java, c++	Last analysis on August 10, 2017 3:47 PM

4 of 4 shown

ANALYSE A FRAMA-C PROJECT

- Sonar scanner
- Metrics:
  - Cyclomatic complexity (Sum, Mean, Min, Max)
  - Line of codes: SLOC (Sum, Mean, Min, Max)
- Sonar web



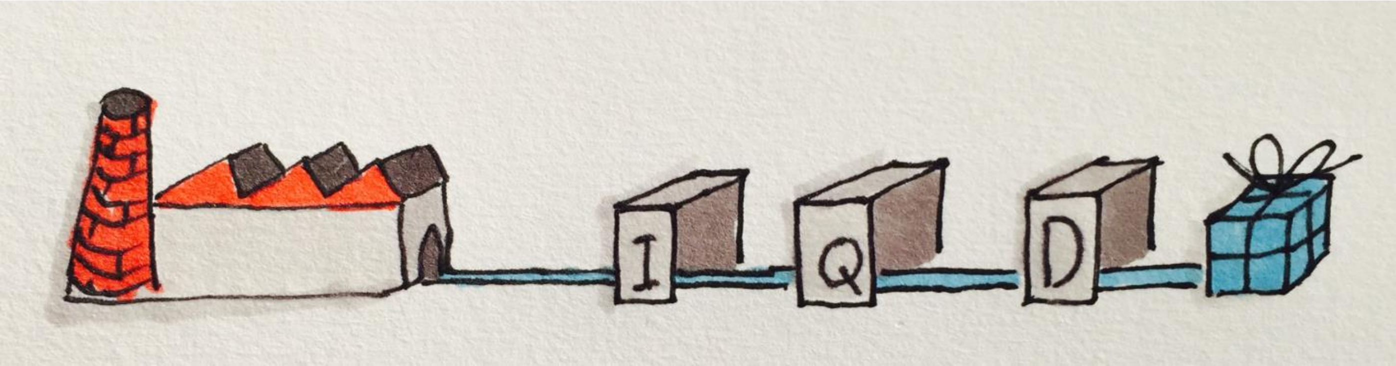
Frama-C :: IT Metrics :: Sonar...

August 30, 2017 6:29 AM Version 1.1

Cyclomatic complexity	7
Cyclomatic complexity (Maximum)	4
Cyclomatic complexity (Mean)	3.5
Cyclomatic complexity (Minimum)	3
Number of error messages	1
Number of lines of code	27
Number of lines of code (Maximum)	15
Number of lines of code (Mean)	13.5
Number of lines of code (Minimum)	12

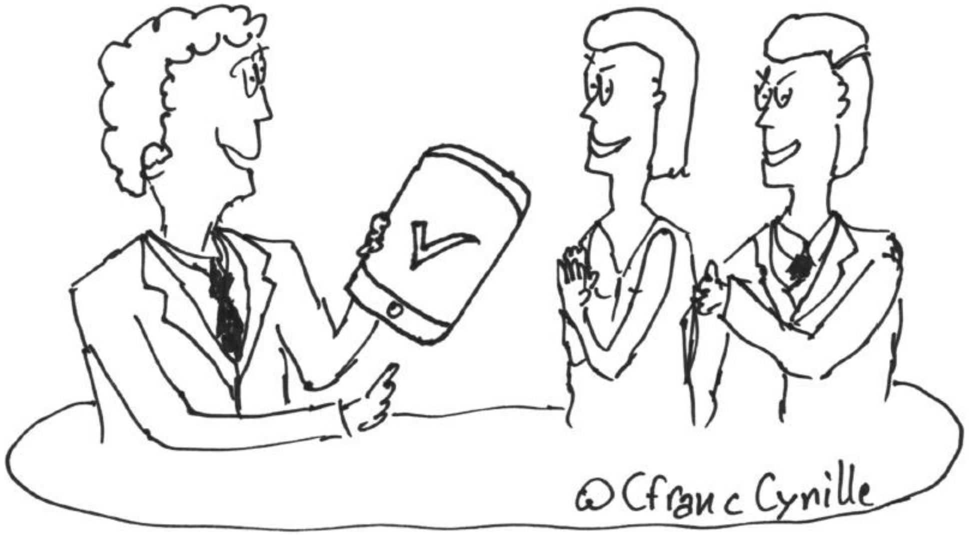
DEVOPS

- From a new plugin revision => deploy-plugin.sh
- To a new project analysis into Sonar



QUALITY PROFILES & RULES

- Frama-C default Quality Profile without rules
- Create a new Quality Profile
- Pattern matching



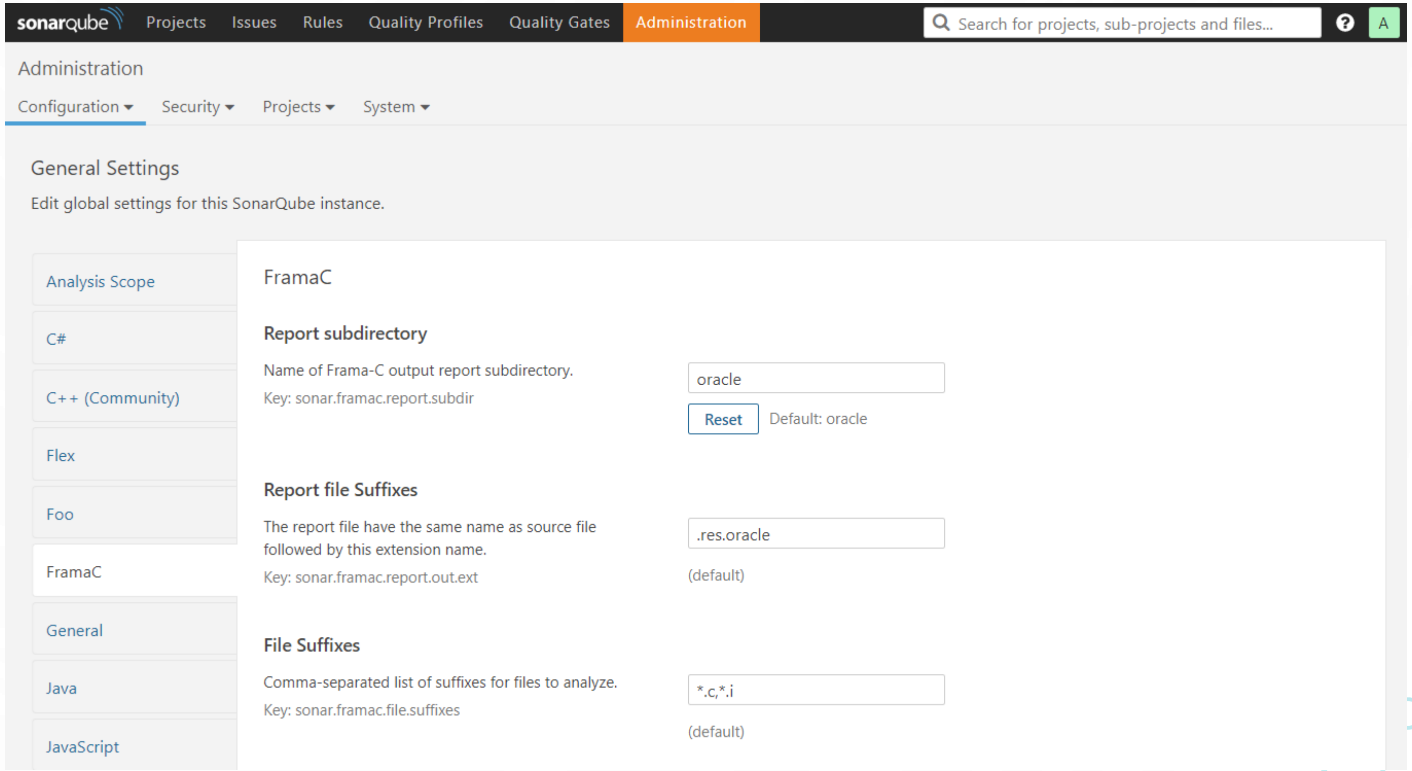
FRAMA-C RULES & ISSUES

- Plug-in resources: framac-rules.xml
- Sonar issues

Expected pattern	Rule
[value] warning:	VALUE.0
[value] warning: accessing uninitialized left-value	VALUE.1
[value] warning: signed overflow	VALUE.2
[value] warning: global initialization of volatile variable	VALUE.3
[value] warning: non-finite	VALUE.4
[value] warning: initialization of volatile variable	VALUE.5
[value] warning: pointer comparison	VALUE.6
[value] warning: division by zero	VALUE.7
[value] warning: locals	VALUE.8
[value] warning: detected recursive call	VALUE.9
[value] warning: during initialization of variable	VALUE.10
[value] warning: ignoring non-existing function	VALUE.11

PLUGIN FRAMA-C PREFERENCES

- File suffixes for *FramaCLanguage*
- Report file suffixes:
  - Replace the source file extension
- Report sub-directory
- Plugin metrics:
  - Number of error messages
  - Report files error



Administration

General Settings

Edit global settings for this SonarQube instance.

FramaC

Report subdirectory

Name of Frama-C output report subdirectory.

Key: sonar.framac.report.subdir

oracle

Default: oracle

Report file Suffixes

The report file have the same name as source file followed by this extension name.

Key: sonar.framac.report.out.ext

.res.oracle

(default)

File Suffixes

Comma-separated list of suffixes for files to analyze.

Key: sonar.framac.file.suffixes

.c,.i

(default)

CONTINUOUS INTEGRATION (CI)

Github -> Travis -> sounar.cloud

- Create Travis and sonar.cloud account
- Configure Travis into Github project
- Add sonar.cloud key to .travis.yml
- Demo & CNES Github/Travis/etc settings

CONCLUSION

- Generic architecture
- Frama-C rules definition with properties file
- Simples plug-in preferences
- Ready to DevOps & CI

- Compliant with ICode requirements ?
- How to define a new Frama-C rule ?
- How to associate Frama-C warning to a Sonar Rule ?