Quality and Certification – Final Assignment

Title: Static Analysis Tools for LLVM Clang

The scope of this project is to perform a static analysis of the Clang compiler source code available at https://llvm.org/ , https://clang.llvm.org/ .

In details, the project consists in:

- Analyze the C/C++ source code for the Clang project, using different tools for static analysis. The minimum number of tools that shall be selected is 2, and mandatorily it shall be used Understand++ and Clang static analyzer.
- Discuss the output of the different tools and their performance.

Some possible tools for static analysis are:

- Understand++ https://scitools.com/student/
- SonarCube https://www.sonarqube.org/
- Cert C Rosechecker (also available pre-installed in a Virtual Machine) https://www.cert.org/secure-coding/tools/rosecheckers.cfm
- Clang static analyzer
- Cppcheck
- Many others can be retrieved from
  https://www.owasp.org/index.php/Source_Code_Analysis_Tools
  https://en.wikipedia.org/wiki/List_of_tools_for_static_code_analysis#C,_C++

Depending on the characteristics of the selected tool, it is recommended to comment on:

- the output of the static analyzers with respect to the computed metrics,
- compliance to coding rules as MISRA, CERT C, ISO/IET 17961,
- correct/missed/false detection.

It is recommended to compare the output of the tools with the information that is already available about the source code and provided by the developers, especially in terms of existing weaknesses of the software.

The delivery of the project is expected to be a zip file that includes the following artefacts:

- A report in pdf format containing:
  - The discussion of the code inspection and static analysis, with documented evidence of the results and of the observations reported. Ancillary artefacts e.g., log files, may be kept separate but they shall be properly referred to in the report.
  - All the information required to reproduce the analysis.
- All the artefacts possibly created or generated during the execution of the exercise, including log files, configuration files, and source code.

Please submit all the produced artefacts, in a **zip** file, via mail to:

- Andrea Ceccarelli andrea.ceccarelli@unifi.it
- Lorenzo Falai lorenzo.falai@resiltech.com

For questions, please write to:

- Andrea Ceccarelli andrea.ceccarelli@unifi.it
- Lorenzo Falai lorenzo.falai@resiltech.com