#

Static analysis tools for CIP packages

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IEC-62443 Requirement for Static Code Analysis

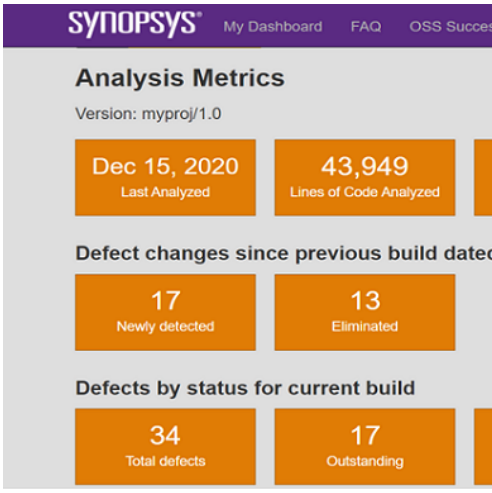
- IEC-62443-4-1 SI-2
  - Static Code Analysis for source code to determine security coding errors such as buffer overflow, null pointer dereferencing etc, using the secure coding standard for the supported programming languages
- Exida comment
  - This requirement refers to static analysis tools, Static analysis must be run on the source code, the combination of code reviews and static analysis should confirm that the coding guidelines have been met. Further investigation needed to verify if Coverity by Synopsys could possibly be used as it is free for open source projects

Coverity Scan

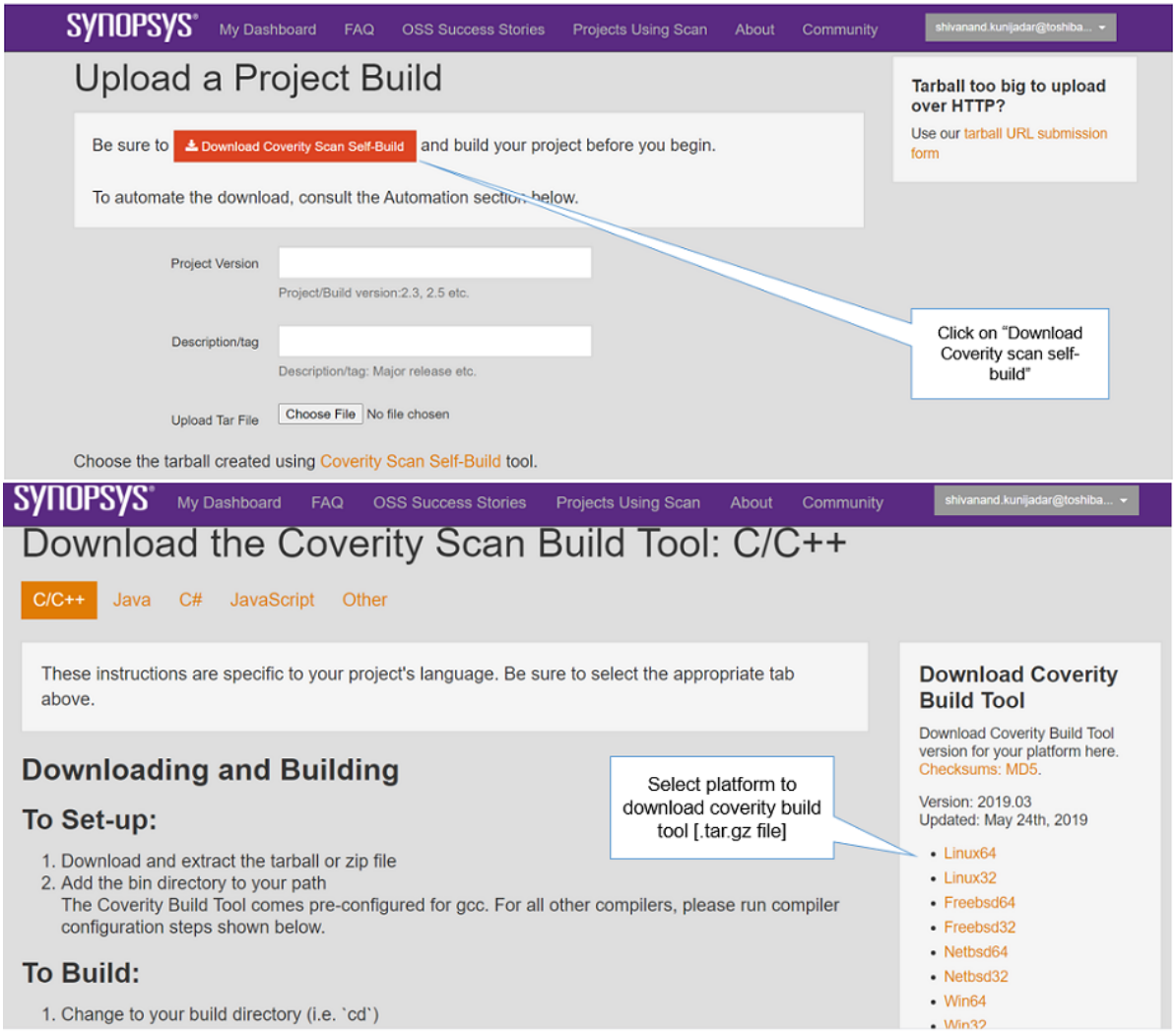
Coverity Scan is a free static-analysis cloud-based service for the open source community

How to use Coverity scan

1. Create account & register an open source project in coverity scan website https://scan.coverity.com/



2. Download coverity scan self-build tool from coverity scan website(.tar.gz)

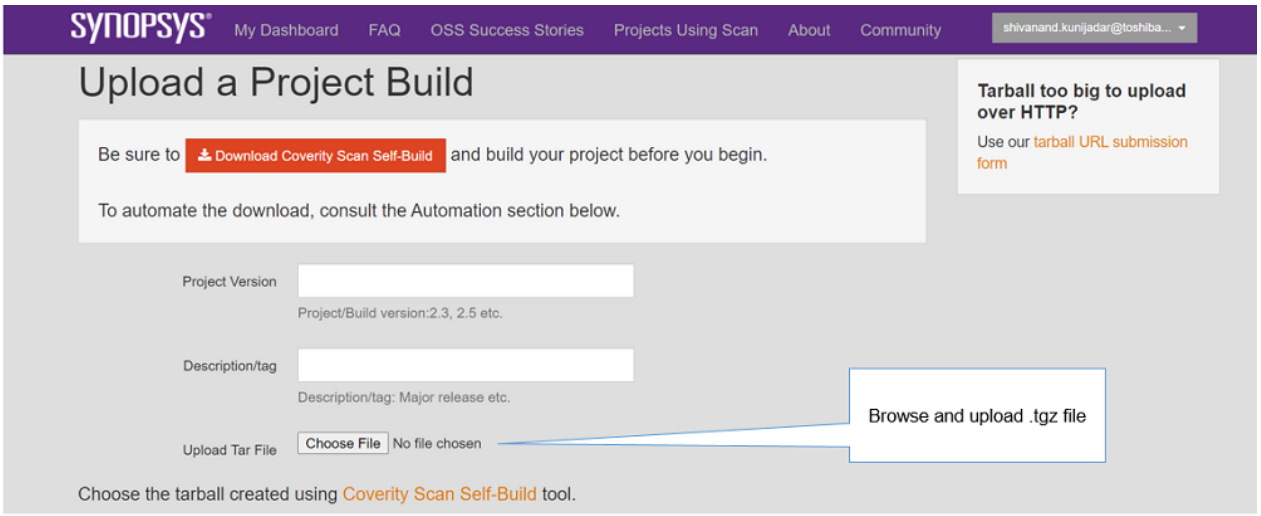


3. Extract .tar.gz and add the coverity scan self-build tool's bin directory to the path in Linux PC
   - $ export PATH=$PATH: $(pwd)/cov-analysis-linux64-2019.03/bin
4. Checkout repository/package and run the Coverity scan self-build tool inside the repository
   - $ cov-build –dir cov-int `<build command>`
   - Ex: $ cov-build –dir cov-int make –> Build command `make` might change based on the package or repository
5. Create a compress tar archive of the results (generates .tgz file)
   - $ tar czvf myproject.tgz cov-int –> Upload the generated tarball(.tgz) to the coverity scan website for analysis

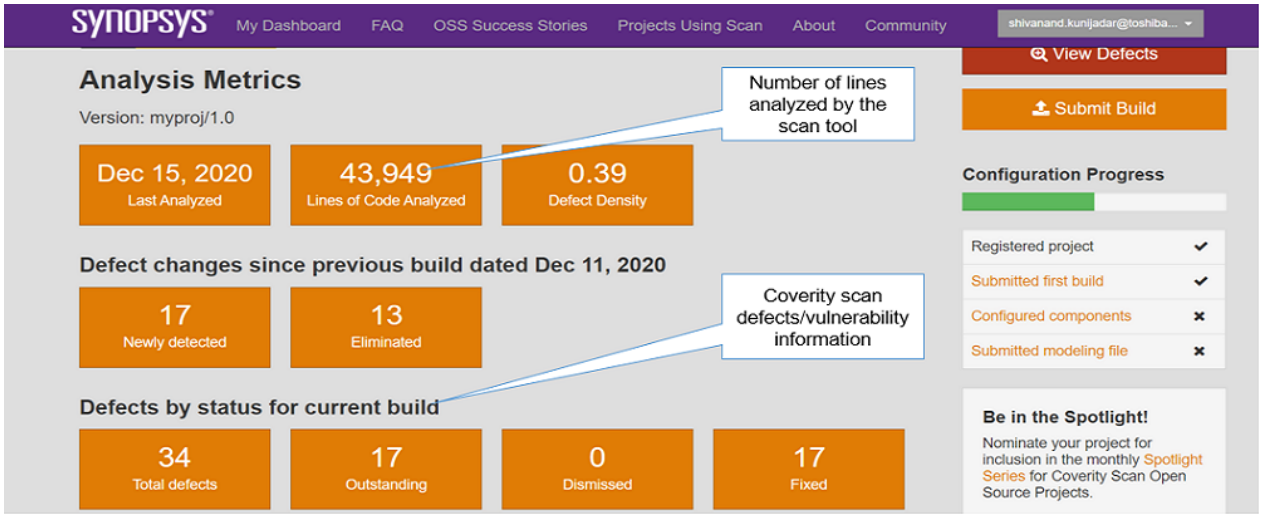
Note:

- Click on "submit build" -> "Download Coverity Scan Self-Build" option to see the detailed steps on how to use the coverity scan tool https://scan.coverity.com/download?tab=cxx
- Register multiple projects if coverity scan analysis is required for multiple packages/repositories

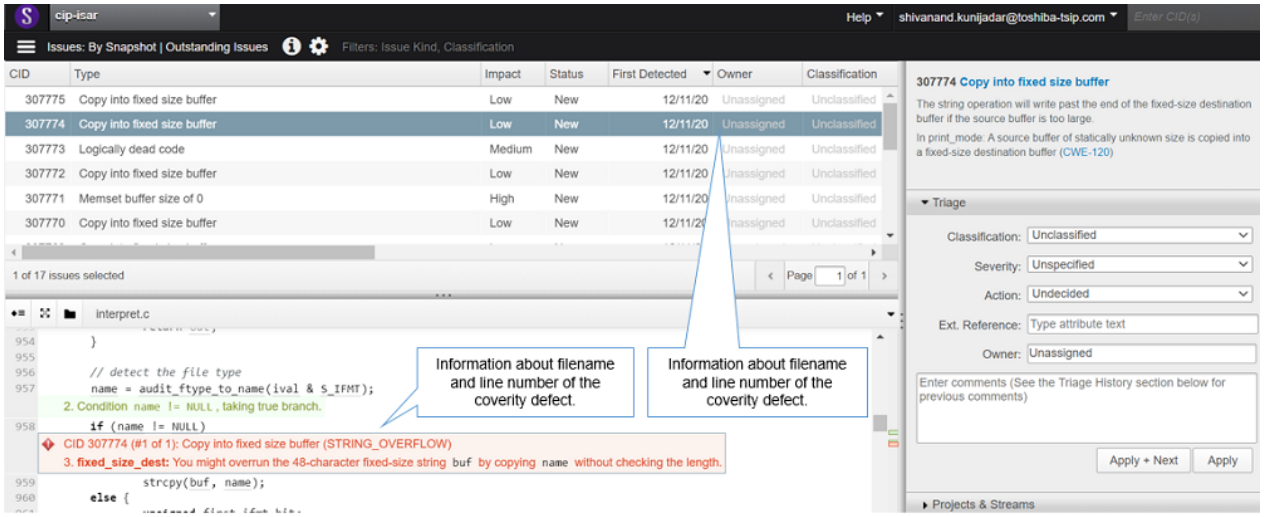
6. Click on "Submit Build" to upload tarball(myproject.tgz) to coverity scan website



7. Select project to see analysis metrics from the coverity website



8. Click on “View Defects” option to see Defects/Vulnerabilities from the coverity scan website



Note: * The coverity scan analysis can be integrated to Gitlab CI after project registration *

https://www.synopsys.com/blogs/software-security/integrating-coverity-scan-with-gitlab-ci/

Key points:

- Coverity scan is free static analysis and cloud based service tool
- Automation is possible using Gitlab CI
- Results can be easily published as coverity scan provides the defects view option
- Needs to create separate project for each package if there are multiple packages

Gitlab SAST

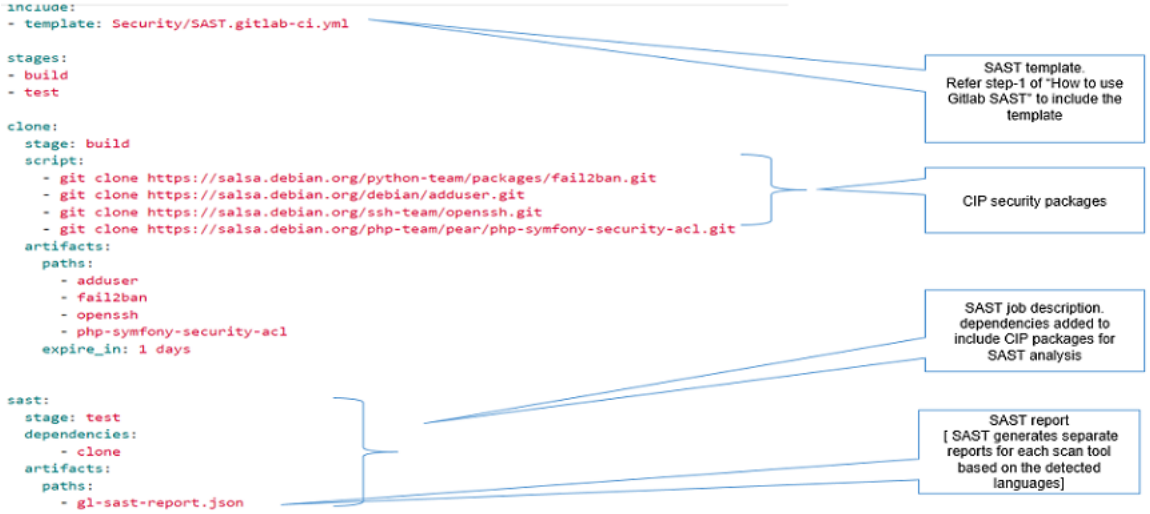
GitLab Software Application Security Testing(SAST) supports a variety of languages, package managers, and frameworks

How to use Gitlab SAST

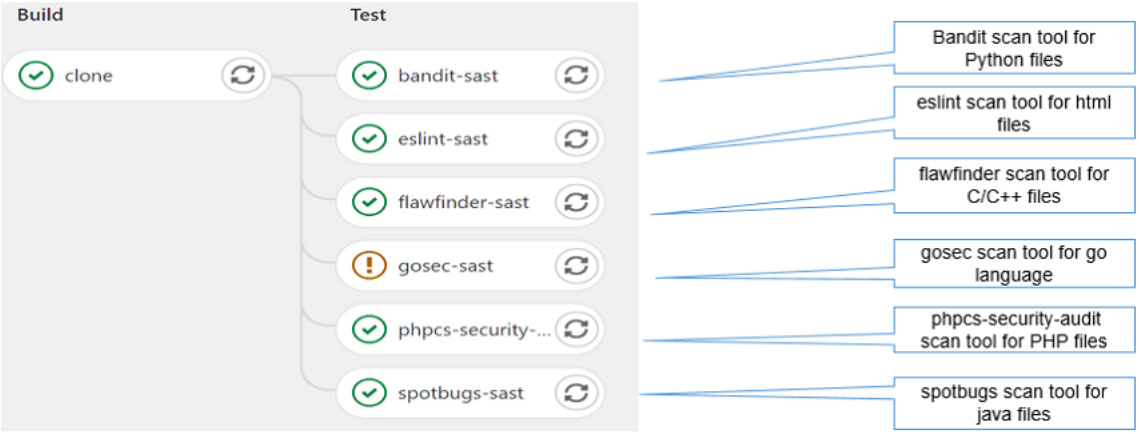
1. Refer the following link for how to configure the SAST in the project using Gitlab UI
    - https://docs.gitlab.com/ee/user/application_security/sast/#configure-sast-in-the-ui
2. SAST job runs automatically once the SAST is enabled and configured in the .yml file
3. Refer the below link for supported languages and frameworks
    - https://docs.gitlab.com/ee/user/application_security/sast/#supported-languages-and-frameworks

Note: * Refer the content of SAST.gitlab-ci.yml file in the below link * https://gitlab.com/gitlab-org/gitlab/blob/master/lib/gitlab/ci/templates/Security/SAST.gitlab-ci.yml

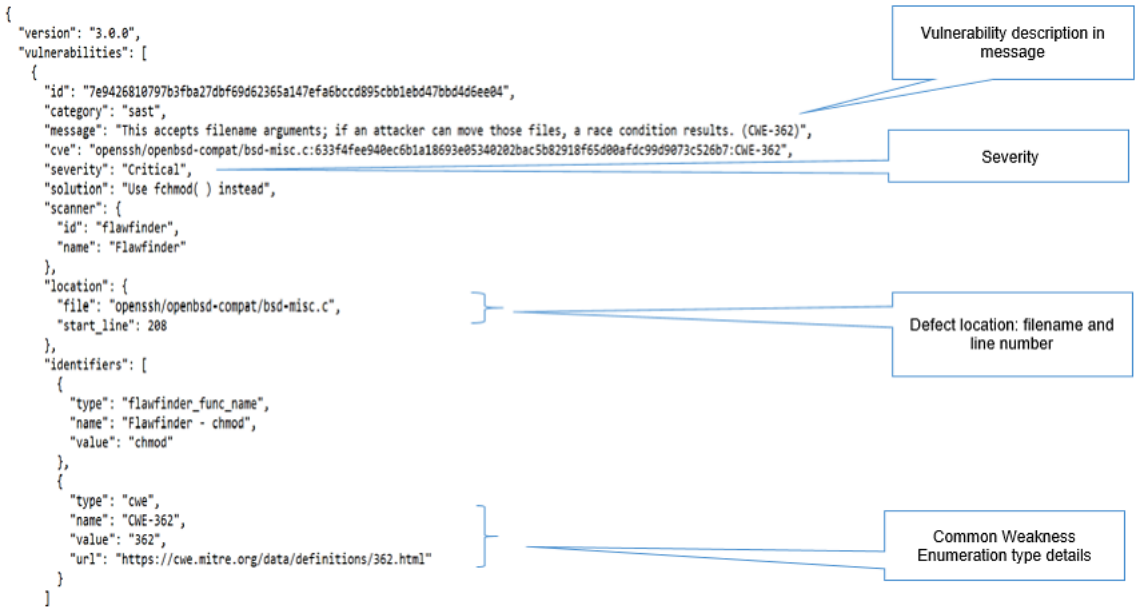
4. Example: .gitlab-ci.yml file configuration looks as below



5. The SAST scan tools checks the repository for suitable files based on the scan tools and runs the job if suitable file/files are present in the repository



6. Each scan tool generates separate report (gl-sast-report.json) and can be downloaded via artifacts
7. SAST flawfinder scan tool report looks as below



Key points:

- Open source static analyzer from Gitlab for CI environment
- Creates separate reports in json format for each scan tool
- Generates combined reports if there are multiple packages
- Need to check how to publish the results to upstream from the SAST reports (json)

Next Step

Following steps would be required further to apply Static Code Analysis (SCA) in CIP * Finalize list of CIP packages for SCA * Integrating either coverity scan or gitlab SAST tool in isar-cip-core and Deby * How to report issues found during SCA to upstream