Static Analysis Report

Revision

Version 3
9/8/23 4:23 PM

SME

Process: Charles Wilson
Report: Marwan Abi-Antoun

Abstract

This document describes the process used to create a static analysis report.

Group / Owner

DevOps / Information Systems Security Developer

Motivation

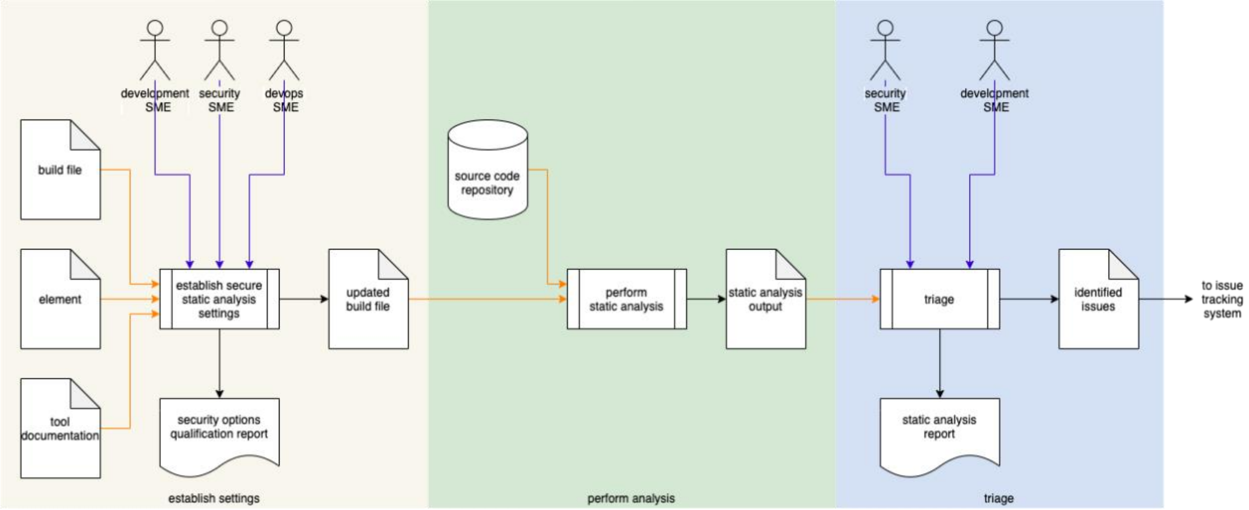
This document is motivated by the need to have early security-related implementation feedback in the development of software for use within safety-critical, cyber-physical systems for certification of compliance to standards such as **ISO/SAE 21434** and **ISO 26262**.

License

Overview

After compiler feedback, static analysis provides the fastest feedback available to developers as to possible security issues within their code.

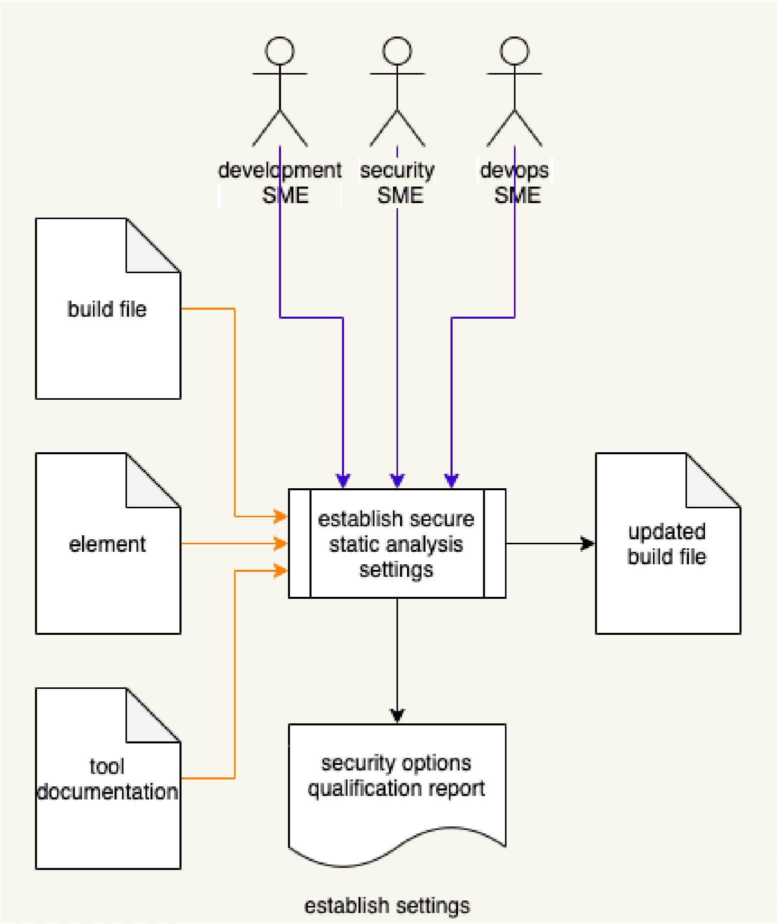
The following diagram illustrates the process to be used:



Process

Establish Settings

Inputs	Build file Element Tool documentation
Outputs	Updated build file Security options qualification report
Participants	Development SME Security SME DevOps SME

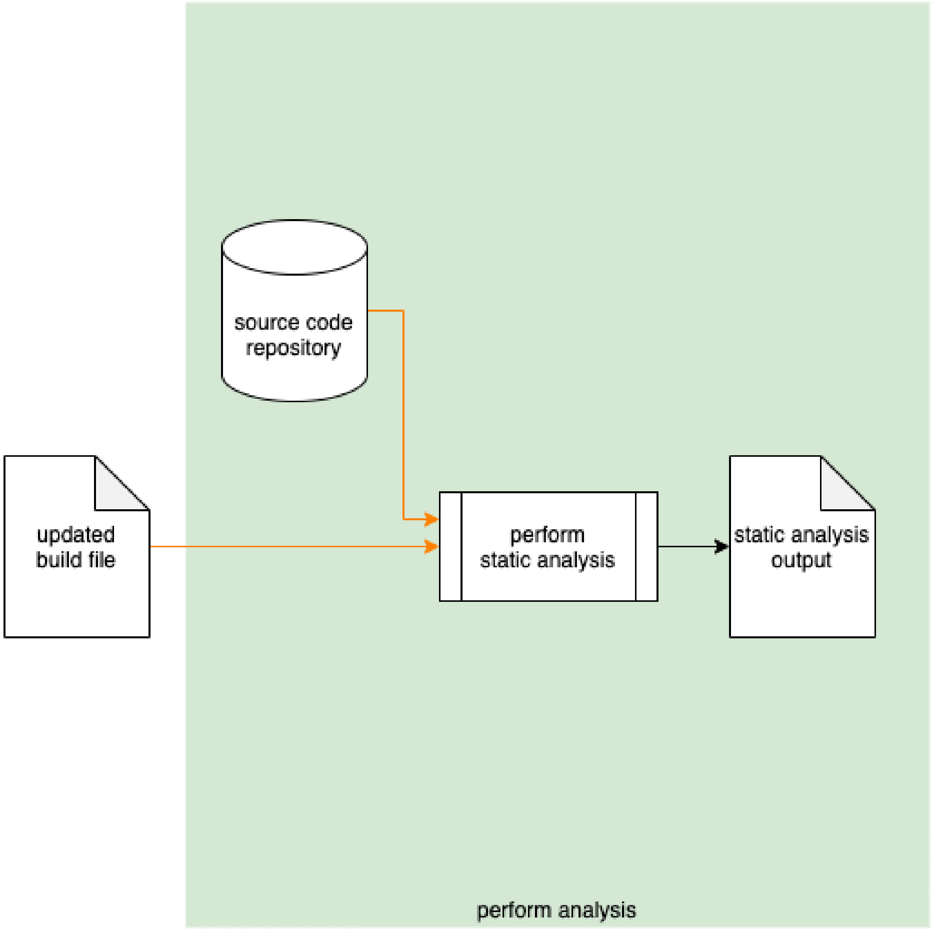


Using the **Element** under consideration, static analysis **Tool Documentation**, and **Build File**; the Development SME, Security SME, and Devops SME will work together following the **Secure Settings Document** [2] process to determine what element aspect needs to be tested and what static analysis tool settings are needed to enable that testing. An **Updated Build File** will be produced. A **Security Options Qualifications Report** is generated.

Note: The scope of the element may be as small as a single file or as large as the entire project.

Perform Analysis

Inputs	Updated build file Source code repository
Outputs	Static analysis output
Participants	**none**

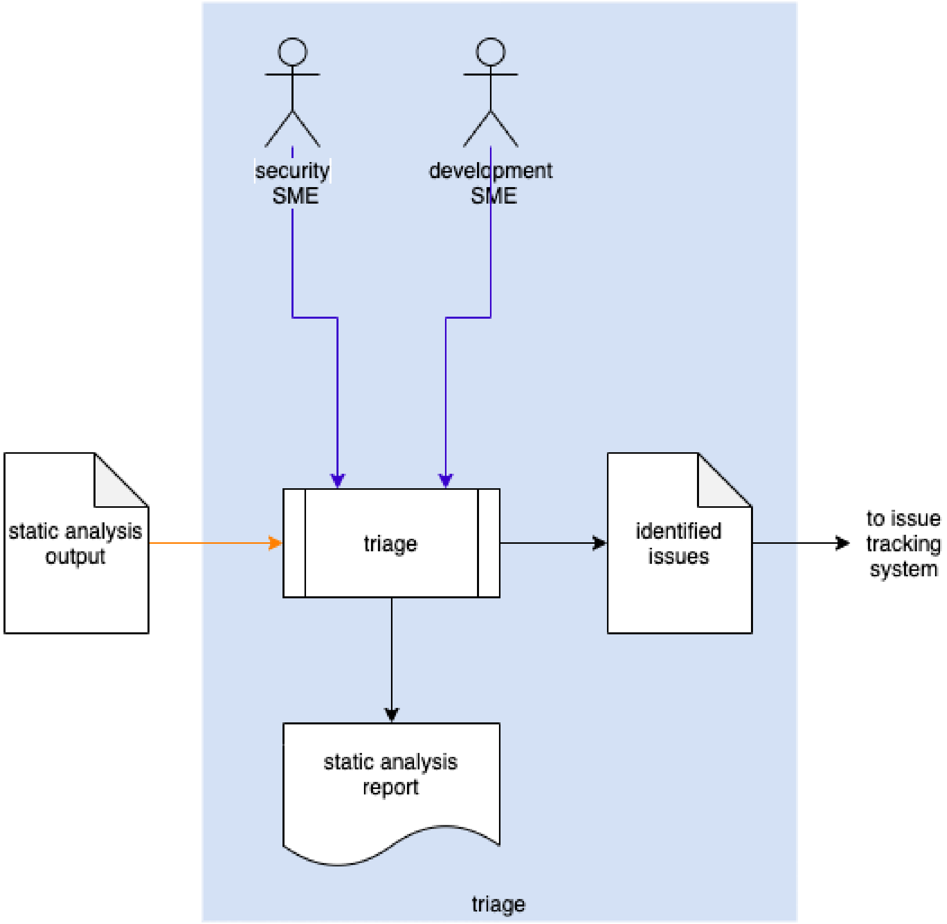


Using the settings from the **Updated Build File**, the **Static Analysis Tool** takes the **Source Code Repository** and performs an analysis on the element. The generated output is captured into **Static Analysis Output**.

Note: The scope of the analysis may be as small as a single file or as large as the entire repository.

Triage

Inputs	Static analysis output
Outputs	Identified issues Static analysis report
Participants	Security SME Development SME



The Security SME and the Development SME review the **Static Analysis Output** to identify any issues needing further investigation. For any such, an issue will be created in the issue tracking system. A **Static Analysis Report** will be generated.

Identified Issues

The recommended form of the **Identified Issues** artifact is a Static Analysis Results Interchange Format (**SARIF**) encoded JSON. This document assumes SARIF version 2.1.0 [1] or later.

Static Analysis Report

The **Static Analysis Report** is recommended to be produced from the **Identified Issues** artifact and should detail the issues exposed by the static analysis.

The report contains one or more analysis runs. Each run includes:

- Description of the tool used
- Description of the analyzed element
- Tool invocation settings
- Results of the analysis

The tool description includes:

- Name
- Version
- URI to tool documentation
- Tool rules

The tool rules (one or more) convey the classes of analysis performed. Each includes:

- ID (unique)
- Name
- Short description of the rule
- Full description of the rule
- URI to rule documentation
- Reference (optional) to associated taxonomy entry (Common Weakness Enumeration, …)

The analyzed element description (one or more) provides information related to the element under consideration. Each includes:

- URI to analyzed element
- URI to repository the element came from

The analysis results (one or more) describe the issues exposed by the analysis. Each includes:

- Human-readable description
- Location within the element of the issue
- Severity of the issue
- Reference (optional) to the associated taxonomy entry

References

1. **Static Analysis Results Interchange Format (SARIF) Version 2.1.0** https://docs.oasis-open.org/sarif/sarif/v2.1.0/os/sarif-v2.1.0-os.pdf
2. **Secure Settings Document** (AVCDL secondary document)
3. **Fuzz Testing Report** (AVCDL secondary document)
4. **Dynamic Analysis Report** (AVCDL secondary document)
5. **Security Options Qualification Report** (AVCDL tertiary document)