Build Process Documentation

Revision

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SME

Charles Wilson

Abstract

This document describes the process to document the security aspects of the build process and ensure that justification for the choice of tools is well-reasoned.

Group / Owner

DevOps / Information Systems Security Developer

Motivation

This document is motivated by the need to properly document the build process from a security perspective. This is necessary given the nature of safety-critical, cyber-physical systems, subject to certifications such as **ISO 21434** and **ISO 26262**.

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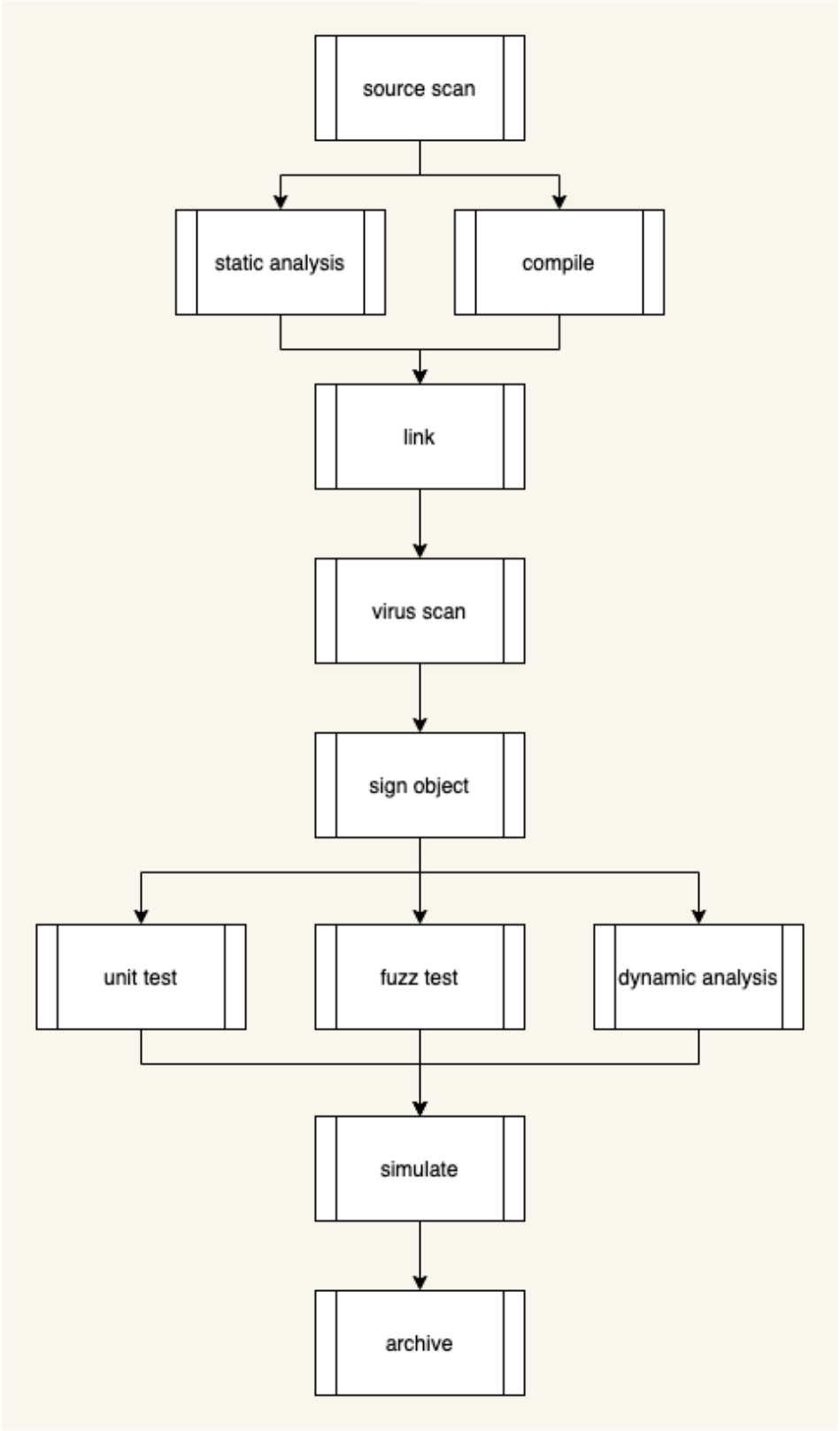
Overview

Compilers and other development tools may provide security checking. Security-relevant tools must be enumerated, their security scope identified, and their use justified. It is important to realize that there is no single tool or process which when applied will detect every security issue. Because of this, multiple tools and processes may be employed to attain the level of coverage as deemed appropriate for the product and its application.

The following diagram illustrates a typical build workflow where the activities all have security relevancy:



Documentation

This documentation is intended as a high-level summary showing how the various tools provide security coverage. It draws upon information curated in both during tool ingest and identification of available security-related options.

For each activity in the build process with security relevancy, the following must be detailed:

Information	Description
Activity	Activity name
Function	Activity performed
Tool	Tool used to perform activity
Input	What the activity consumes
Output	What the activity produces
Security relevancy	Why the activity is security relevant
Security coverage	What security issues are detected

For example:

Activity	compile
Function	code compilation
Tool	clang
Input	source code
Output	object code, diagnostics
Security relevancy	function-scoped security checks
Security coverage	bad pointer behavior, uninitialized variable use

Note: The **List of Approved Tools** AVCDL secondary document covers the ingest of tools used in product creation and their tracking.

Note: The **Secure Settings Document** AVCDL secondary document covers the specifics of individual tool security options and their justifications.

References

1. **SAFECode Fundamental Practices for Secure Software Development**: *Use Current Compiler and Toolchain Versions and Secure Compiler Options* https://safecodedev.wpengine.com/wp-content/uploads/2018/03/SAFECode_Fundamental_Practices_for_Secure_Software_Development_March_2018.pdf
2. **C-Based Toolchain Hardening** https://wiki.owasp.org/index.php/C-Based_Toolchain_Hardening
3. **List of Tools Used** (AVCDL secondary document)
4. **Secure Settings Document** (AVCDL secondary document)