Soft4Soft
RESORT Code Analysis

RESORT Static Analysis Tool

❑ Static Analysis Tool

- C, C++, C#, Java(JSP), R, Python, JavaScript, Flex, ABAP
- (Swift, Objective-C)
- Android (Kotlin, Android-Java)

❑ *IDE Plug-in*

- Eclipse, Intellij, Android Studio, Visual Studio, Xcode, UtraEdit, etc.
- Jenkins, etc.

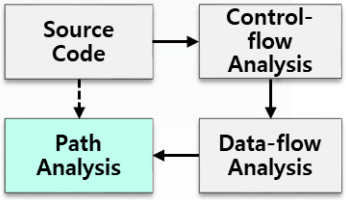
❑ Static Analysis Process

Code Analysis
Inter-procedure
↓
Defect Detection
Defect Code
Security Hole
↓
Defect Dashboard
Code Violation
Rule Compliance
↑
Safety & Security Consulting Service

❑ Certification

- ISO 26262
- IEC 61508
- EN 50128
- ISO 9001
- CWE Compatibility

❑ Static Code Analysis Techniques



RESORT static analysis automatically extracts the feasible paths according to the correct execution order of subprograms and functions within the entire program. It then checks and verifies code defects and security vulnerabilities with the code state values on each feasible path.

❑ Static Code Analysis Features

- **(no Compile Step)** Static code analysis without the compile build step
- **(no False Positive)** Inter-procedural path analysis-powered path data-flow analysis
- **(no Rule Option)** All code checks of code standards, safety, security, and code metrics
  - The concept of "One Guide to One Rule" to prevent duplicate detection
- **(Tool Qualification)** ISO 26262, IEC 61508, EN 50128, CWE Compatibility, etc.

Coding Standards

- MISRA-C, MISRA-C++, JSF++, Java Code Convention, JPL Java & C
- Automotive Embedded C, C++ Coding Guide Compliance
- Language Coding Standards: JavaScript, Python, R, ABAP, Mobile(iOS, Android)

Safety (Run-time Analysis)

- CWE-658(for C), CWE-659(for C++), CWE-660(for Java), AUTOSAR C++14
- Automotive Embedded C, C++ Run-time Compliance

Security (Security Vulnerability)

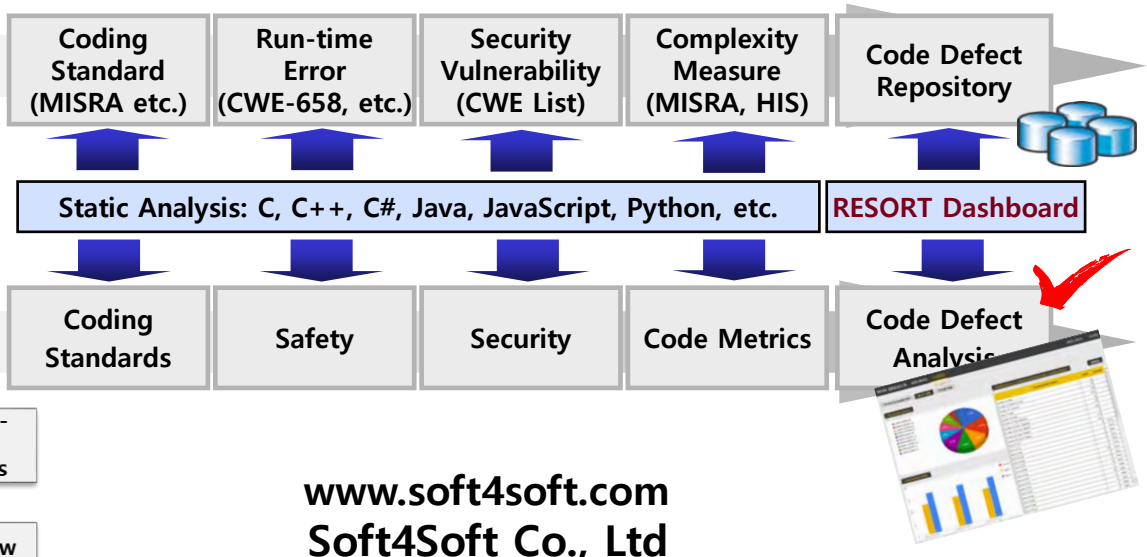
- CWE, OWASP, CERT
- Automotive Embedded C, C++, Java Security Compliance

Code Metrics (Complexity)

- MISRA Software Metrics
- HIS Source Code Metrics: C, C++, C#, Java

Software Safety Compliance

- ISO 26262(automotive), IEC 61508(electrical/electronic), EN 50128(railway), etc.
- ISO 9001



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Soft4Soft
RESORT Code Analysis

RESORT Software & Firmware Test Tools

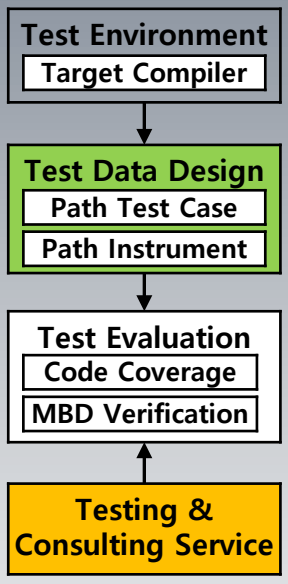
❑ Test Tool

- C, C++, C#, Java
  - Automated White-box Path Test
  - Path-based Fault Injection Test
  - GUI SW Test
  - Firmware Test

❑ Supported Compilers

- C/C++/C# test supports all compiler families based on build approach

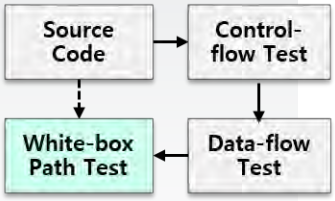
❑ Test Process



❑ Certification

- IEC 62279

❑ Test Design Techniques



RESORT tools supporting wide lifecycle from code verification to system (firmware) testing through path analysis of source code.

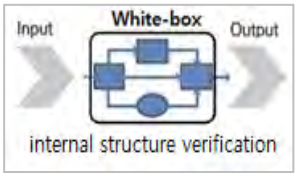
RESORT software and firmware tests automatically generate test data for the feasible paths and support all validations from unit to system test.

❑ Software & Firmware Testing Features

- **(no Compile Step)** Automated Software & Firmware test after build target
- **(White-box Path Test)** Feasible path test based on code in the host
  - Automated Generation of the feasible paths per function and their test cases
  - Integrated support for path-based fault injection test
- **(GUI SW Test)** Desktop/web/mobile GUI Software test based on binary code
- **(Firmware Test)** Firmware test based on binary code in the target hardware

White-box Path Test(Unit/Integration Test)

- White-box Path Test based on Path or Instrumented Technologies
- Automated Test Case Generation for Code Coverage



GUI Software Test

- GUI SW Test (Client and/or Server Application)
- GUI Requirement Scenario Test
- Extraction of Real-time Structural Coverage during GUI operation

Firmware Test

- Firmware Test (SW(binary) + HW(board) + Communication(UART)
- UART(RS232, 422, 485) Protocol Scenario Test
- Extraction of Real-time Structural Coverage during CPU operation in ECU/MCU

Code Coverage

- Structure Coverage: Statement, Branch, MC/DC, Path, Function, Call
- Requirement Coverage: Requirement Traceability and Consistency

Model-Based Design(MBD) Verification

- (test-to-path) Verification of Testing Path for Branch, MC/DC: Control-flow Graph
- (test-to-scenario) Verification of Scenario(integration) Testing: Call Graph
- (test-to-code) Visualization of Structural Coverage Type for Code: File Code View

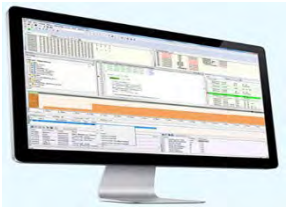
Software Test Requirement Compliance

- IEC 62279(railway)

Firmware Test's One Workbox Workflow

- Test Workflow of Firmware Test and Embedded Workbench
- Verification of firmware based on UART protocol scenarios on actual hardware
- (verification) SW & HW Safety
- (verification) Real-time Timing Requirements

RESORT Firmware Test



Embedded Workbench