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C++ static code analysis

Unique rules to find Bugs, Vulnerabilities, Security Hotspots, and Code Smells in your C++ code

All rules 578 | Vulnerability 13 | Bug 111 | Security Hotspot 18 | Code Smell 436 | Quick Fix 68

Tags

Search by name...

"memset" should not be used to delete sensitive data
Vulnerability

POSIX functions should not be called with arguments that trigger buffer overflows
Vulnerability

XML parsers should not be vulnerable to XXE attacks
Vulnerability

Function-like macros should not be invoked without all of their arguments
Bug

The address of an automatic object should not be assigned to another object that may persist after the first object has ceased to exist
Bug

Assigning to an optional should directly target the optional
Bug

Result of the standard remove algorithms should not be ignored
Bug

"std::scoped_lock" should be created with constructor arguments
Bug

Objects should not be sliced
Bug

Immediately dangling references should not be created
Bug

"pthread_mutex_t" should be unlocked in the reverse order they were locked
Bug

"pthread_mutex_t" should be properly initialized and destroyed
Bug

"pthread_mutex_t" should not be consecutively locked or unlocked twice

"for" loop stop conditions should be invariant

Analyze your code

Code Smell | Major | based-on-misra pitfall

A `for` loop stop condition should test the loop counter against an invariant value (i.e. one that is true at both the beginning and ending of every loop iteration). Ideally, this means that the stop condition is set to a local variable just before the loop begins.

Stop conditions that are not invariant are slightly less efficient, as well as being difficult to understand and maintain, and likely lead to the introduction of errors in the future.

This rule tracks three types of non-invariant stop conditions:

- When the loop counters are updated in the body of the `for` loop
- When the stop condition depend upon a method call
- When the stop condition depends on an object property, since such properties could change during the execution of the loop.

Noncompliant Code Example

```
for (int i = 0; i < 10; i++) {
  ...
  i = i - 1; // Noncompliant
  ...
}

for (int i = 0; i < getMaximumNumber(); i++) {  // Noncomplia
}
```

Compliant Solution

```
for (int i = 0; i < 10; i++) {
  ...
}
int stopCondition = getMaximumNumber();
for (int i = 0; i < stopCondition; i++) {
}
```

See

- MISRA C:2004, 13.6 - Numeric variables being used within a *for* loop for iteration counting shall not be modified in the body of the loop.
- MISRA C++:2008, 6-5-3 - The *loop-counter* shall not be modified within *condition* or *statement*.

Available In:

sonarlint | sonarcloud | sonarqube Developer Edition

Bug

"std::move" and "std::forward" should not be confused

Bug

A call to "wait()" on a "std::condition_variable" should have a condition

Bug

A pointer to a virtual base class shall only be cast to a pointer to a derived class by means of dynamic_cast

Bug

Functions with "noreturn" attribute should not return

Bug

RAII objects should not be temporary

Bug

"memcmp" should only be called with pointers to trivially copyable types with no padding

Bug

"memcpy", "memmove", and "memset" should only be called with pointers to trivially copyable types

Bug

"std::auto_ptr" should not be used

Bug

Destructors should be "noexcept"

Bug