

































-  Secrets
-  ABAP
-  Apex
-  C
-  **C++**
-  CloudFormation
-  COBOL
-  C#
-  CSS
-  Flex
-  Go
-  HTML
-  Java
-  JavaScript
-  Kotlin
-  Kubernetes
-  Objective C
-  PHP
-  PL/I
-  PL/SQL
-  Python
-  RPG
-  Ruby
-  Scala
-  Swift
-  Terraform
-  Text
-  TypeScript
-  T-SQL
-  VB.NET
-  VB6
-  XML



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

 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

Loops should not have more than one "break" or "goto" statement

Analyze your code

Code Smell Major based-on-misra confusing

Restricting the number of exits from a loop is done in the interests of good structured programming. One break or goto statement is acceptable in a loop since this allows, for example, for dual-outcome loops or optimal coding.

Noncompliant Code Example

With the default threshold of 1:

```
for (int i = 0; i < 10; i++) {
    if (...) {
        break;           // Compliant
    }
    else if (...) {
        break;           // Non-compliant - second jump from loop
    }
    else {
        ...
    }
}
while (...) {
    if (...) {
        break;           // Compliant
    }
    if (...) {
        break;           // Non-compliant - second jump from loop
    }
}
```

Compliant Solution

```
for (int i = 0; i < 10; i++) {
    if (...) {
        break;           // Compliant
    }
}
while (...) {
    if (...) {
        break;           // Compliant
    }
}
```

See

- MISRA C:2004, 14.6 - For any iteration statement there shall be at most one break statement used for loop termination.
- MISRA C++:2008, 6-6-4 - For any iteration statement there shall be no more than one break or goto statement used for loop termination.
- MISRA C:2012, 15.4 - There should be no more than one break or goto statement used to terminate any iteration statement

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