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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

Macros should not be used to define constants

Analyze your code

Code Smell | Critical | cppcoreguidelines bad-practice clumsy

A macro is a textual replacement, which means that it's not respecting the type system, it's not respecting scoping rules... There is no reason not to use a constant instead.

Most of the time, a macro can be replaced by a `constexpr` declaration (a constant that is guaranteed to be computed during compilation). If your compiler is too old to properly handle `constexpr`, you may use `const` instead.

If you have a series of related integer macros, you might also consider replacing them by an `enum`.

Noncompliant Code Example

```
#define MAX_MEMORY 640 // Noncompliant

#define LEFT   0 // Noncompliant
#define RIGHT  1 // Noncompliant
#define JUMP   2 // Noncompliant
#define SHOOT  3 // Noncompliant
```

Compliant Solution

```
constexpr size_t MAX_MEMORY = 640;
enum class Actions {Left, Right, Jump, Shoot};
```

See

- C++ Core Guidelines - ES.31 - Don't use macros for constants or "functions"
- C++ Core Guidelines - Enum.1 - Prefer enumerations over macros

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