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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

Polymorphic base class destructor should be either public virtual or protected non-virtual

Analyze your code

Code Smell | Major | cppcoreguidelines denial-of-service cert

When a class with no `virtual` destructor is used as a base class, surprises can occur if pointers to instances of this class are used. Specifically, if an instance of a derived class is `deleted` through a pointer to the base type, the behavior is undefined and can lead to resource leaks, crashes or corrupted memory.

If it is not expected for base class pointers to be deleted, then the destructor should be made `protected` to avoid such a misuse.

Noncompliant Code Example

```
class Base { // Noncompliant: no destructor is supplied, and
public:
  Base() {}
  virtual void doSomething() {}
};

class Derived : public Base {
}

void f() {
  Base *p = new Derived();
  delete p; // Undefined behavior
}
```

Compliant Solution

```
class Base {
public:
  Base() {}
  virtual ~Base() = default;
  virtual void doSomething() {}
};
```

See

- CERT, OOP52-CPP. - Do not delete a polymorphic object without a virtual destructor
- Virtuality article
- C++ Core Guidelines C.35 - A base class destructor should be either public and virtual, or protected and nonvirtual
- C++ Core Guidelines C.127 - A class with a virtual function should have a virtual or protected destructor

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