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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

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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

Parameters in an overriding virtual function shall either use the same default arguments as the function they override, or else shall not specify any default arguments

Analyze your code

Code Smell

Major

cppcoreguidelines misra-c++2008 pitfall

Overriding the default parameter value inherited from a parent class will lead to unexpected results when the child class is referenced from a pointer to the parent class.

Noncompliant Code Example

```
enum E_ShapeColor {E_RED, E_GREEN, E_BLUE};

class Shape
{
public:
    virtual void draw(E_ShapeColor color = E_RED) const
    {
        ...
    }
};

class Rectangle : public Shape
{
public:
    virtual void draw(E_ShapeColor color = E_BLUE) const override
    {
        ...
    }
};

int main() {
    Shape *shape = new Rectangle{};
    shape->draw(); // unexpectedly calls Rectangle::draw(RED)
}
```

Compliant Solution

```
enum E_ShapeColor {E_RED, E_GREEN, E_BLUE};

class Shape
{
public:
    virtual void draw(E_ShapeColor color = E_RED) const
    {
        ...
    }
};

class Rectangle : public Shape
{
public:
    virtual void draw(E_ShapeColor color) const override
    // OR: virtual void draw(E_ShapeColor color = E_RED) const
    {
        ...
    }
};

int main() {
```

 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

```
Shape *shape = new Rectangle{};
shape->draw(); // expectedly calls Rectangle::draw(RED)
}
```

See

- MISRA C++ 2008, 8-3-1 - Parameters in a overriding virtual function shall either use the same default arguments as the function they override, or else shall not specify any default arguments.

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