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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

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"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

Lines starting with "#" should contain valid preprocessing directives

Analyze your code

 Bug  Major  based-on-misra preprocessor

Preprocessing directives (lines that start with #) can be used to conditionally include or exclude code from compilation. Malformed preprocessing directives could lead to the exclusion or inclusion of more code than was intended. Therefore all preprocessing directives should be syntactically meaningful.

Noncompliant Code Example

```
#define AAA 2
...
int foo(void)
{
    int x = 0;
    ...

#ifdef AAA
    x = 1;
#else /* Noncompliant */
    x = AAA;
#endif

    ...
    return x;
}
```

Compliant Solution

```
#define AAA 2
...
int foo(void)
{
    int x = 0;
    ...

#ifdef AAA
    x = 1;
#else
    x = AAA;
#endif

    ...
    return x;
}
```

See

- MISRA C:2004, 19.16 - Preprocessing directives shall be syntactically meaningful even when excluded by preprocessor.
- MISRA C++:2008, 16-0-8 - If the # token appears as the first token on a line, then it shall be immediately followed by a preprocessing token.
- MISRA C:2012, 20.13 - A line whose first token is # shall be a valid preprocessing directive

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