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C static code analysis

Unique rules to find Bugs, Vulnerabilities, Security Hotspots, and Code Smells in your C code

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Tags

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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

"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

Functions with "noreturn" attribute should not return
Bug

"memcmp" should only be called with pointers to trivially copyable types with no padding
Bug

"default" clauses should be first or last

Analyze your code

Code Smell | Critical | based-on-misra misra-c2004 misra-c2012

`switch` can contain a `default` clause for various reasons: to handle unexpected values, to show that all the cases were properly considered.

For readability purpose, to help a developer to quickly find the default behavior of a `switch` statement, it is recommended to put the `default` clause at the end of the `switch` statement. This rule raises an issue if the `default` clause is not the first or the last one of the `switch`'s cases.

Noncompliant Code Example

```
switch (param) {
  case 0:
    doSomething();
    break;
  default: // default clause should be the first or last one
    error();
    break;
  case 1:
    doSomethingElse();
    break;
}
```

Compliant Solution

```
switch (param) {
  case 0:
    doSomething();
    break;
  case 1:
    doSomethingElse();
    break;
  default:
    error();
    break;
}
```

See

- MISRA C:2004, 15.3 - The final clause of a switch statement shall be the default clause
- MISRA C++:2008, 6-4-6 - The final clause of a switch statement shall be the default-clause
- MISRA C:2012, 16.4 - Every switch statement shall have a default label
- MISRA C:2012, 16.5 - A default label shall appear as either the first or the last switch label of a switch statement

Stack allocated memory and non-owned memory should not be freed

Bug

Closed resources should not be accessed

Bug

Dynamically allocated memory should be released

Bug

Freed memory should not be used

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