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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 409

Vulnerability 34

Bug 76

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Quick Fix 52

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Empty statements should be removed

Code Smell

Fields should not have public accessibility

Code Smell

URIs should not be hardcoded

Code Smell

Types should be named in PascalCase

Code Smell

Track uses of "TODO" tags

Code Smell

Classes with "IDisposable" members should implement "IDisposable"

Bug

Calls to "async" methods should not be blocking

Code Smell

Child class fields should not shadow parent class fields

Code Smell

Track lack of copyright and license headers

Code Smell

Exit methods should not be called

Code Smell

Classes should "Dispose" of members from the classes' own "Dispose" methods

Bug

Reading the Standard Input is security-sensitive

Security Hotspot

Using hardcoded IP addresses is security-sensitive

Analyze your code

Security Hotspot Major owasp

Hardcoding IP addresses is security-sensitive. It has led in the past to the following vulnerabilities:

- [CVE-2006-5901](#)
- [CVE-2005-3725](#)

Today's services have an ever-changing architecture due to their scaling and redundancy needs. It is a mistake to think that a service will always have the same IP address. When it does change, the hardcoded IP will have to be modified too. This will have an impact on the product development, delivery, and deployment:

- The developers will have to do a rapid fix every time this happens, instead of having an operation team change a configuration file.
- It misleads to use the same address in every environment (dev, sys, qa, prod).

Last but not least it has an effect on application security. Attackers might be able to decompile the code and thereby discover a potentially sensitive address. They can perform a Denial of Service attack on the service, try to get access to the system, or try to spoof the IP address to bypass security checks. Such attacks can always be possible, but in the case of a hardcoded IP address solving the issue will take more time, which will increase an attack's impact.

Ask Yourself Whether

The disclosed IP address is sensitive, e.g.:

- Can give information to an attacker about the network topology.
- It's a personal (assigned to an identifiable person) IP address.

There is a risk if you answered yes to any of these questions.

Recommended Secure Coding Practices

Don't hard-code the IP address in the source code, instead make it configurable with environment variables, configuration files, or a similar approach. Alternatively, if confidentially is not required a domain name can be used since it allows to change the destination quickly without having to rebuild the software.

Sensitive Code Example

```
var ip = "192.168.12.42";
var address = IPAddress.Parse(ip);
```

Compliant Solution

```
var ip = ConfigurationManager.AppSettings["myapplication.ip"]
var address = IPAddress.Parse(ip);
```

Exceptions

Using command line arguments is security-sensitive

 Security Hotspot


Using Sockets is security-sensitive

 Security Hotspot

Encrypting data is security-sensitive

 Security Hotspot

Using regular expressions is security-sensitive

 Security Hotspot

Interface methods should be callable by derived types

No issue is reported for the following cases because they are not considered sensitive:

- Loopback addresses 127.0.0.0/8 in CIDR notation (from 127.0.0.0 to 127.255.255.255)
- Broadcast address 255.255.255.255
- Non routable address 0.0.0.0
- Strings of the form 2.5.<number>.<number> as they often match Object Identifiers (OID).

See

- [OWASP Top 10 2021 Category A1](#) - Broken Access Control
- [OWASP Top 10 2017 Category A3](#) - Sensitive Data Exposure

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