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Python static code analysis

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

All rules 216

Vulnerability 29

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Code Smell 101

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Functions should not have too many lines of code
Code Smell
Track uses of "NOSONAR" comments
Code Smell
Track comments matching a regular expression
Code Smell
Statements should be on separate lines
Code Smell
Functions should not contain too many return statements
Code Smell
Files should not have too many lines of code
Code Smell
Lines should not be too long
Code Smell
Methods and properties that don't access instance data should be static
Code Smell
New-style classes should be used
Code Smell
Parentheses should not be used after certain keywords
Code Smell
Track "TODO" and "FIXME" comments that do not contain a reference to a person
Code Smell
Module names should comply with a naming convention

Using hardcoded IP addresses is security-sensitive

Analyze your code

Security Hotspot

Minor ?

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 confidentiality 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

```
ip = '192.168.12.42'
sock = socket.socket()
sock.bind((ip, 9090))
```

Compliant Solution

 Code Smell
Comments should not be located at the end of lines of code  Code Smell
Lines should not end with trailing whitespaces  Code Smell
Files should contain an empty newline at the end  Code Smell
Long suffix "L" should be upper case  Code Smell

```
ip = config.get(section, ipAddress)
sock = socket.socket()
sock.bind((ip, 9090))
```

Exceptions

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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