สยามชำนาญกิจ
SIAM CHAMNAN KIT

Secure Coding

Secure Coding

DevSecOps

https://github.com/up1/course-secure-coding

Goals

Process with security standard
Protect data from breaches
Reduce risk
Early detection

Topics

Secure in Software development life cycle
Secure by Design
OWASP Top 10 (Web and API)
Secure coding guideline and review
DevSecOps and Shift left security
Use cases and workshop

ISO 27001

Standard for managing information security

ISO 27001, A.14

System acquisition, development and maintenance

Security requirement	Security testing and review
Update and patch Software	Protect malware and unwanted code

ISO 27001, A.14

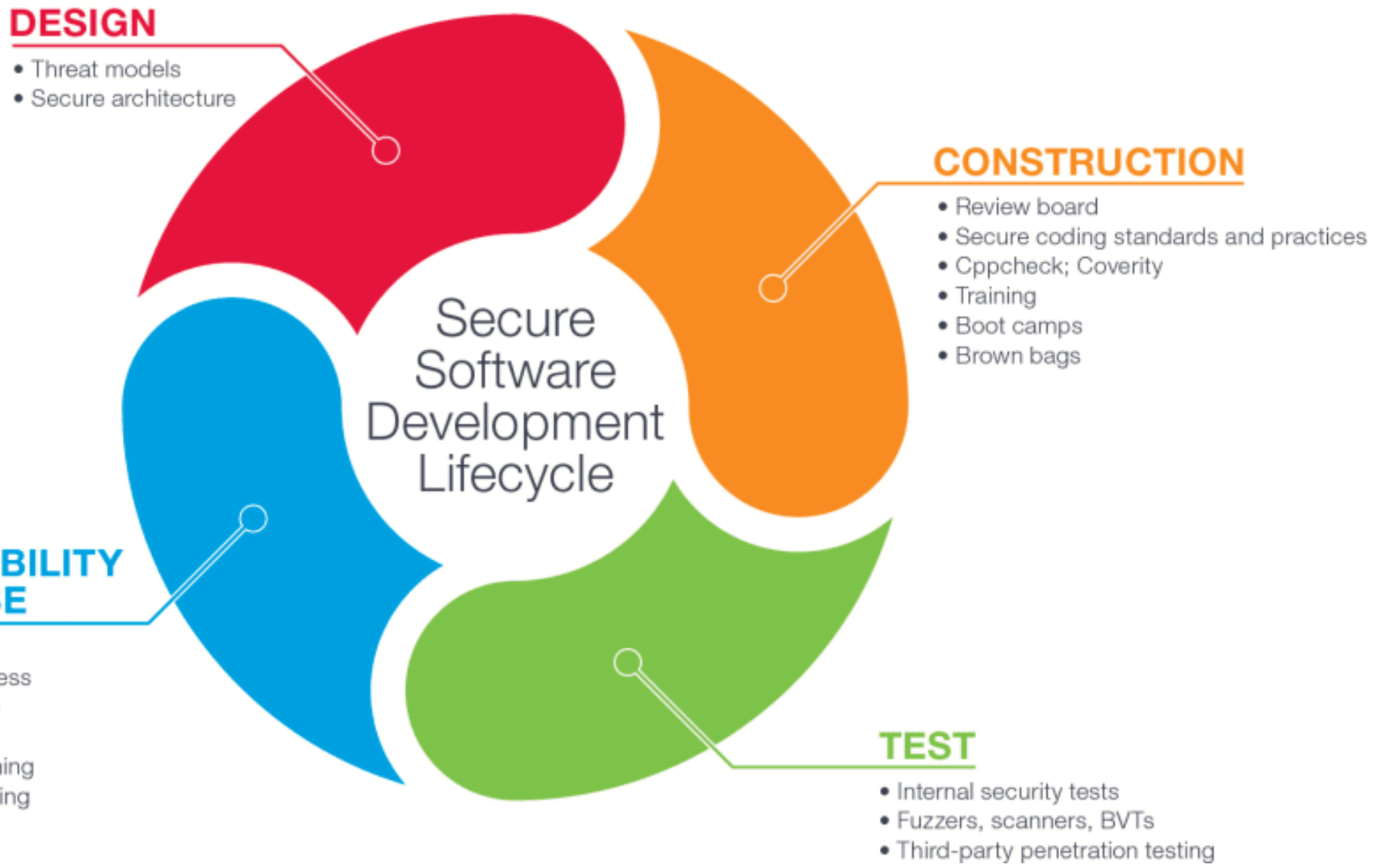
A14.1
Security requirements of information systems

A14.2
Security in development and support processes

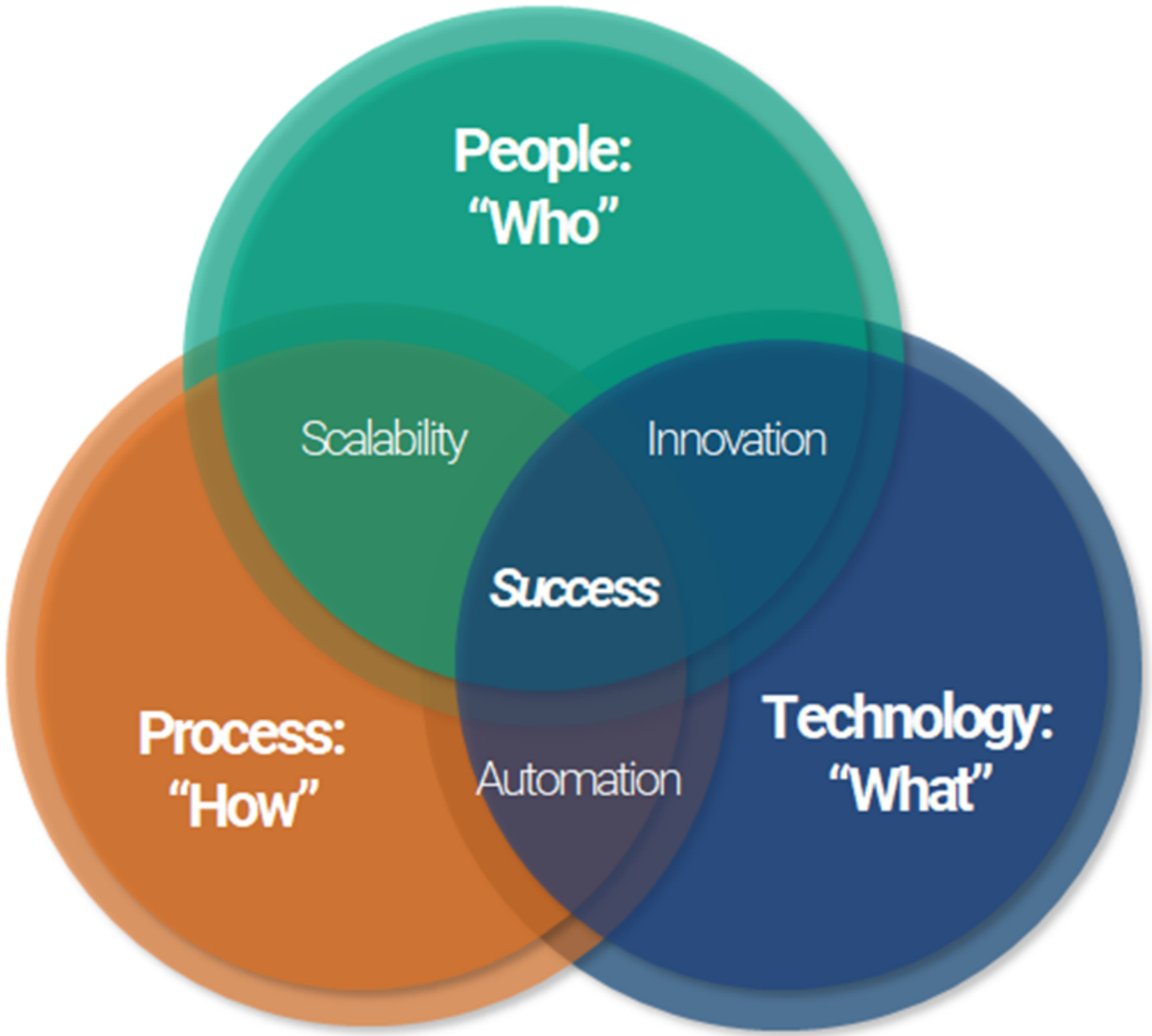
A14.3
Test data

https://iso-docs.com/blogs/iso-27001-standard/iso-27001-annex-a-14-system-acquisition-development-and-maintenance

SDLC with Secure



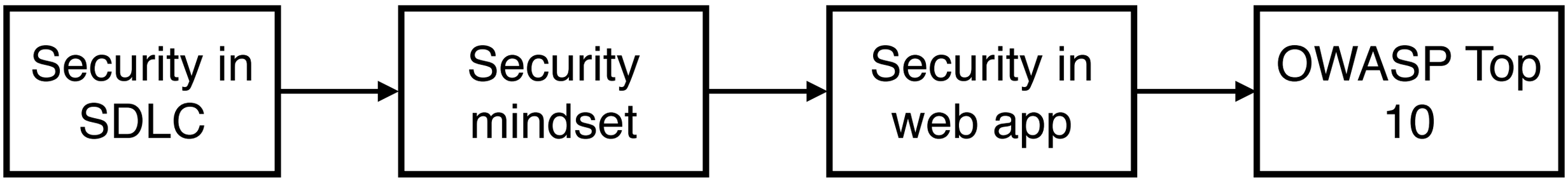
People, Process, Technology



Software Delivery

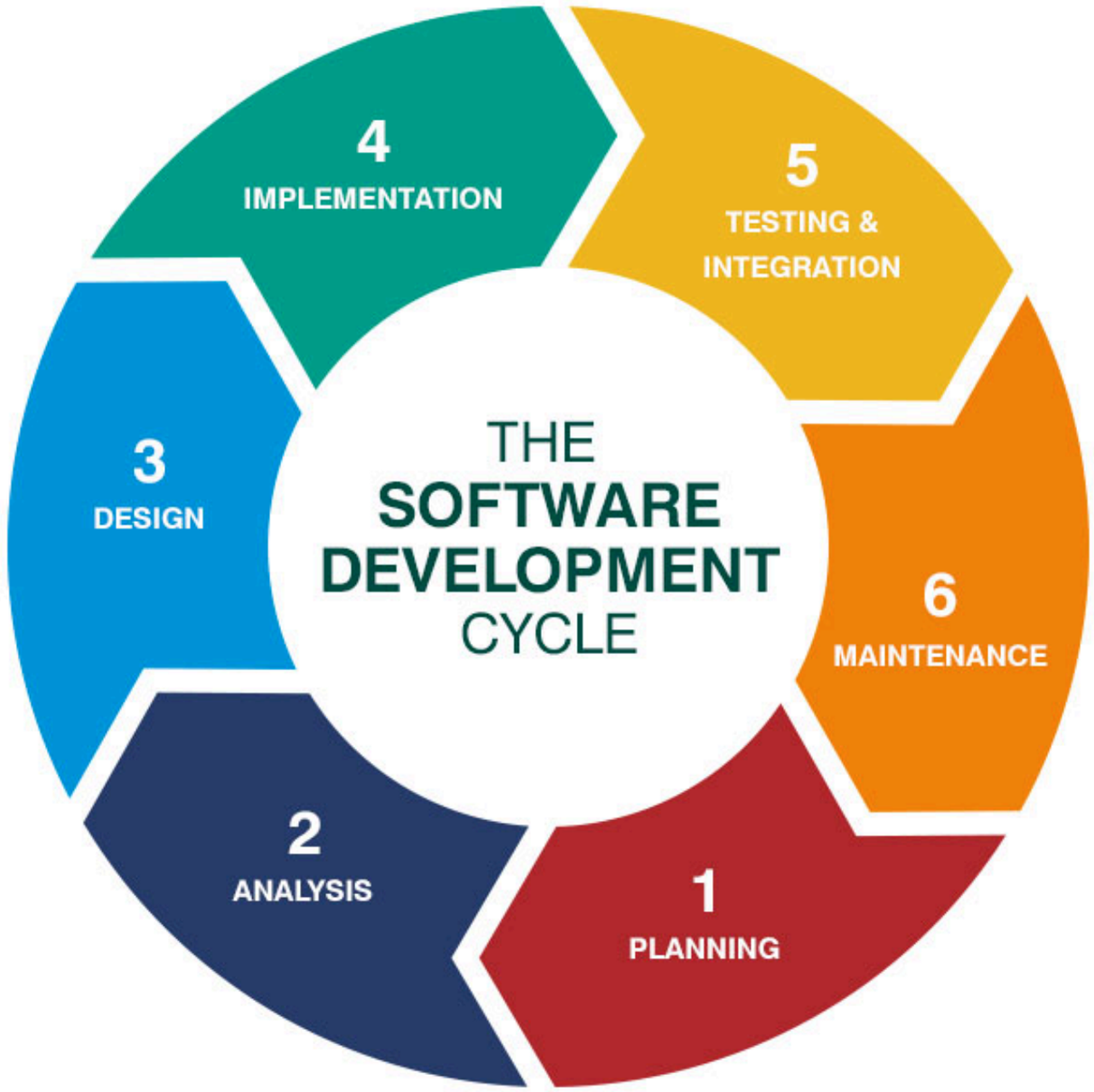
Fast (Time to market)
High quality
Scalable
More secure

Learning Path

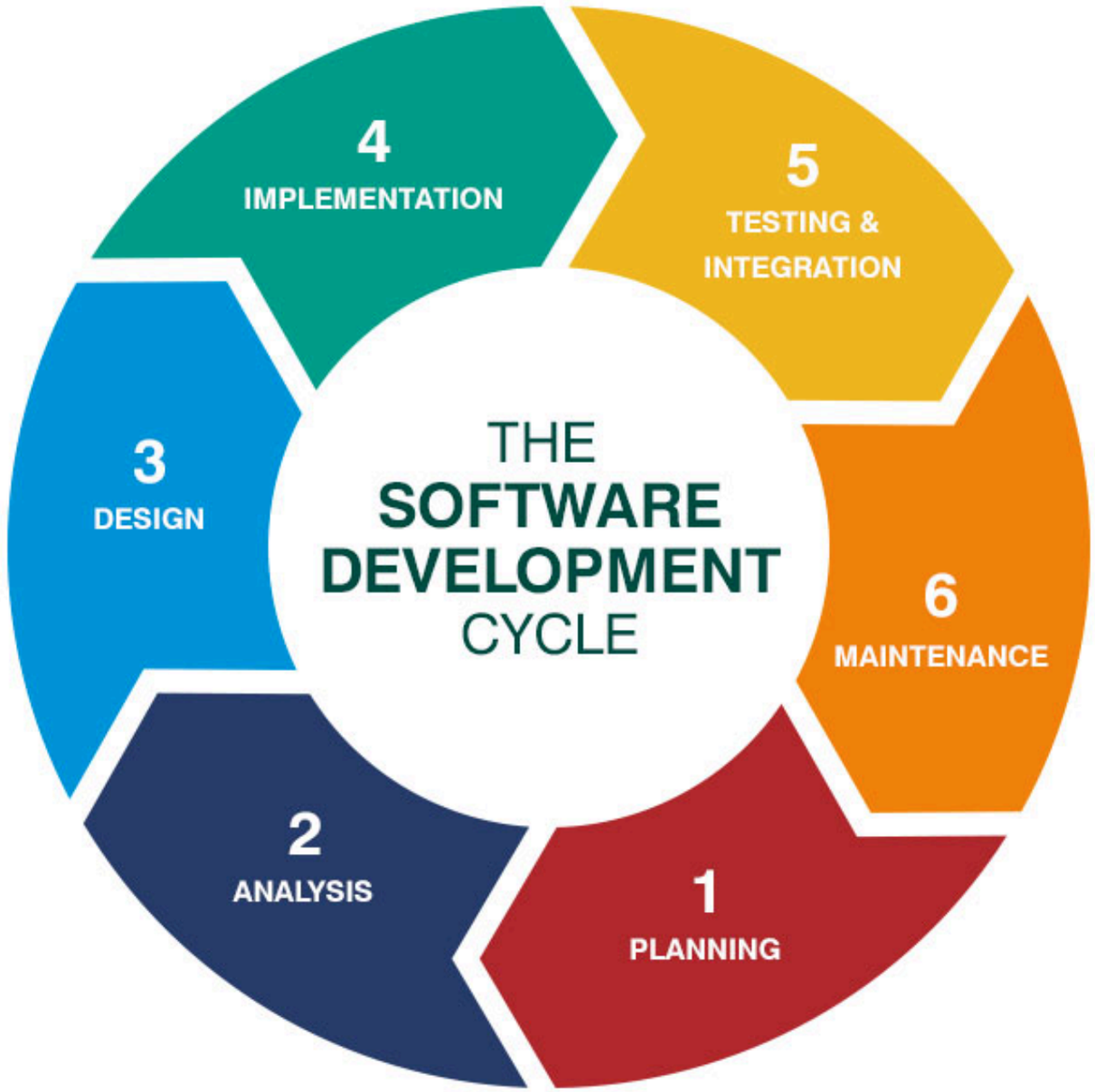


Use cases and Workshop

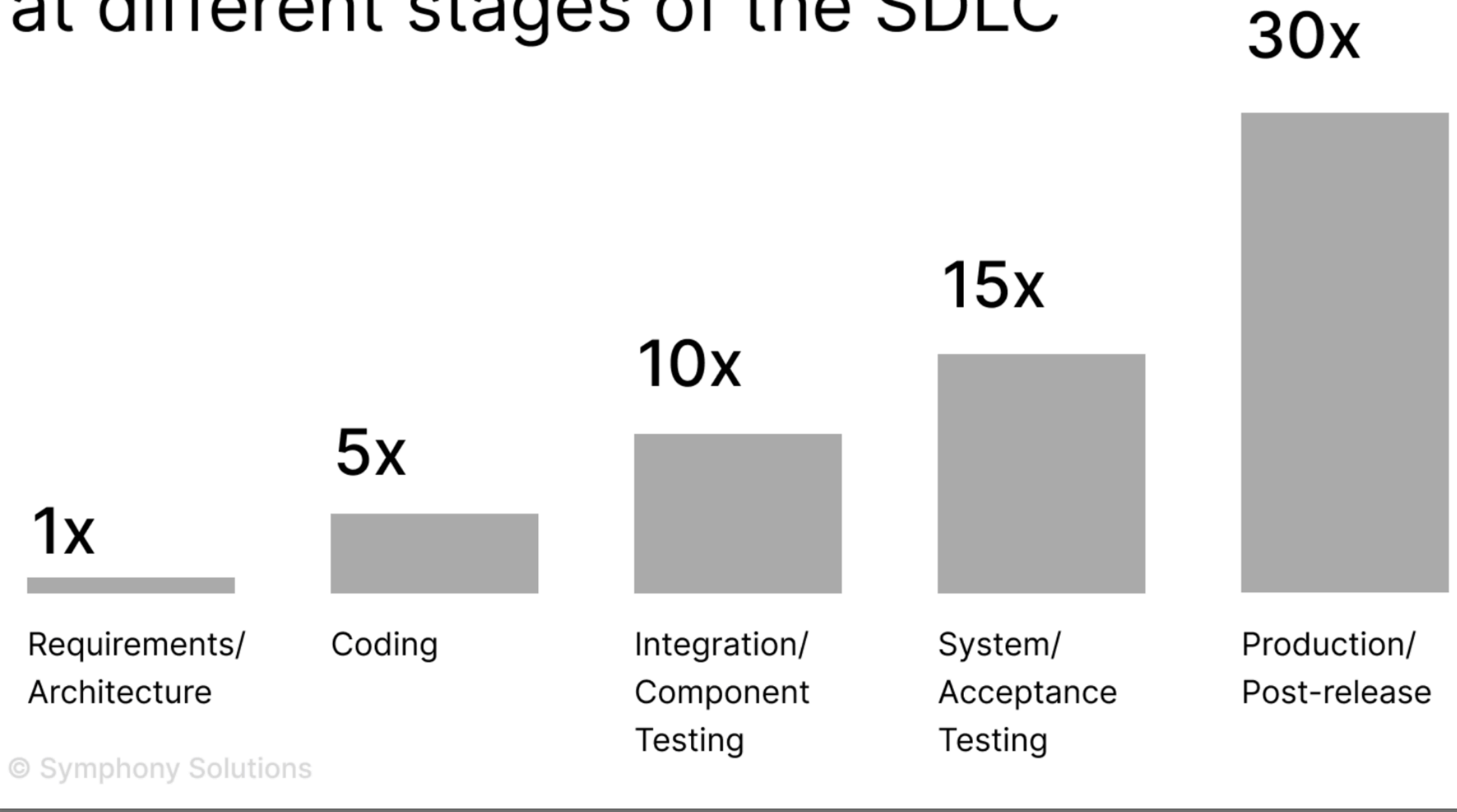
Software Development Life Cycle



Security ?

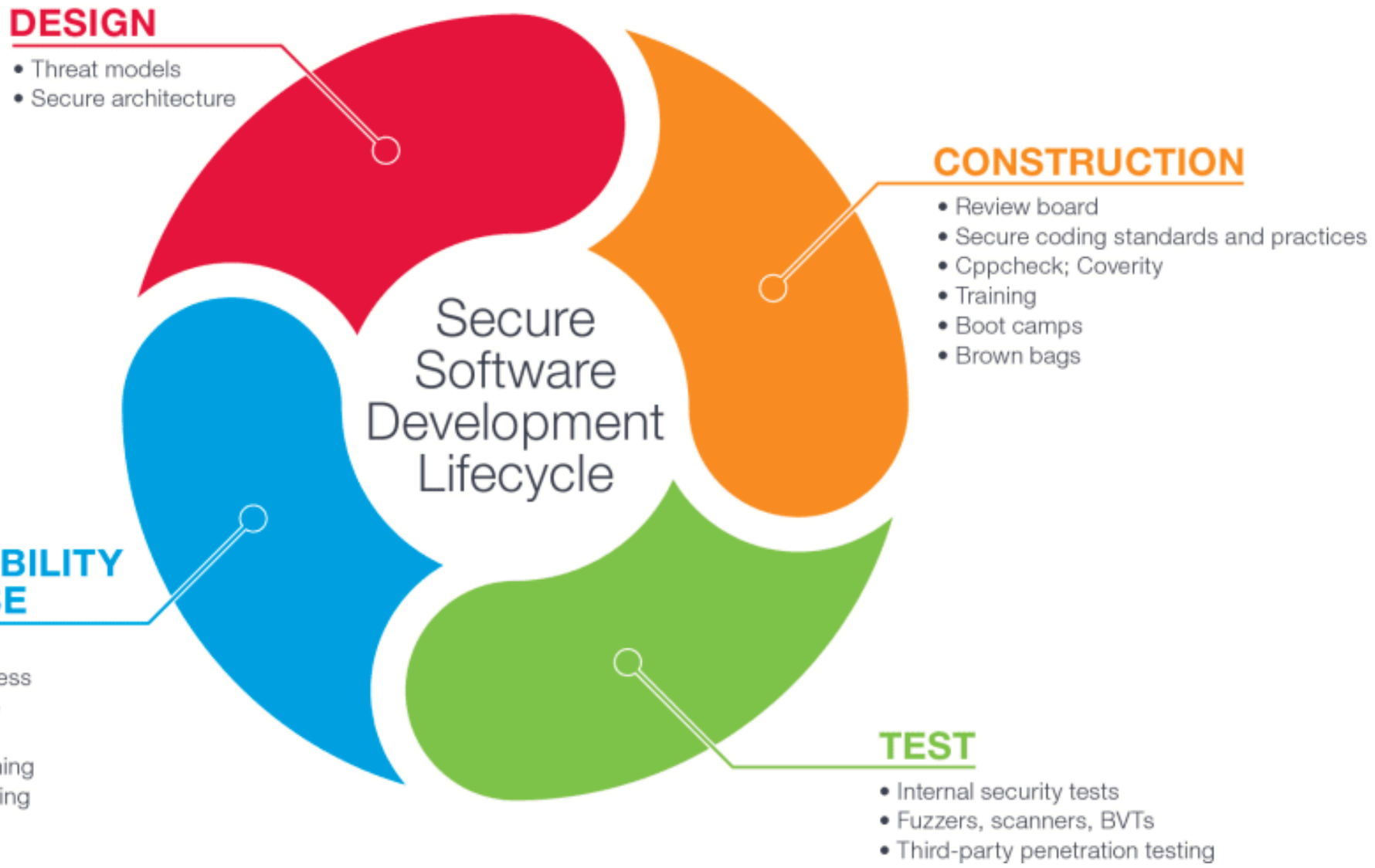


The relative cost of fixing a flaw at different stages of the SDLC

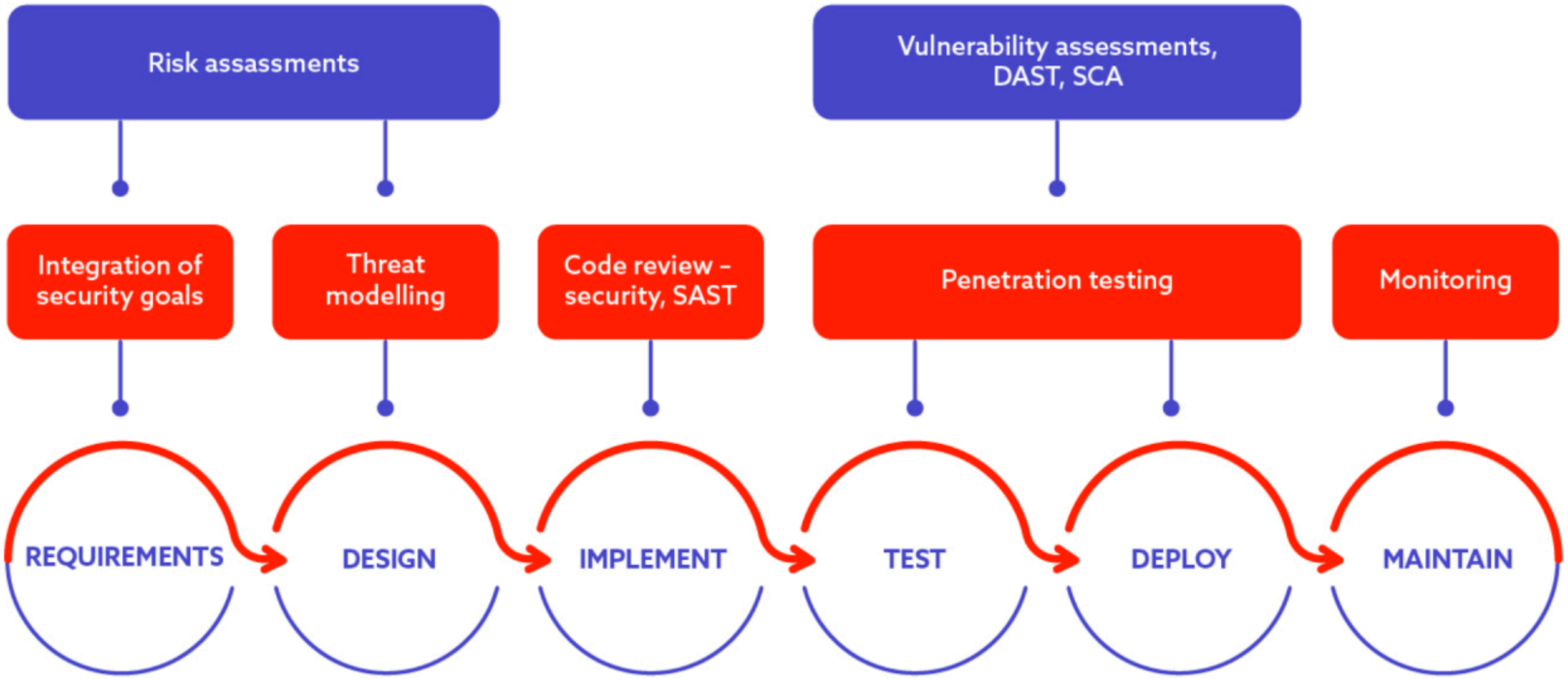


https://symphony-solutions.com/insights/secure-software-development-lifecycle

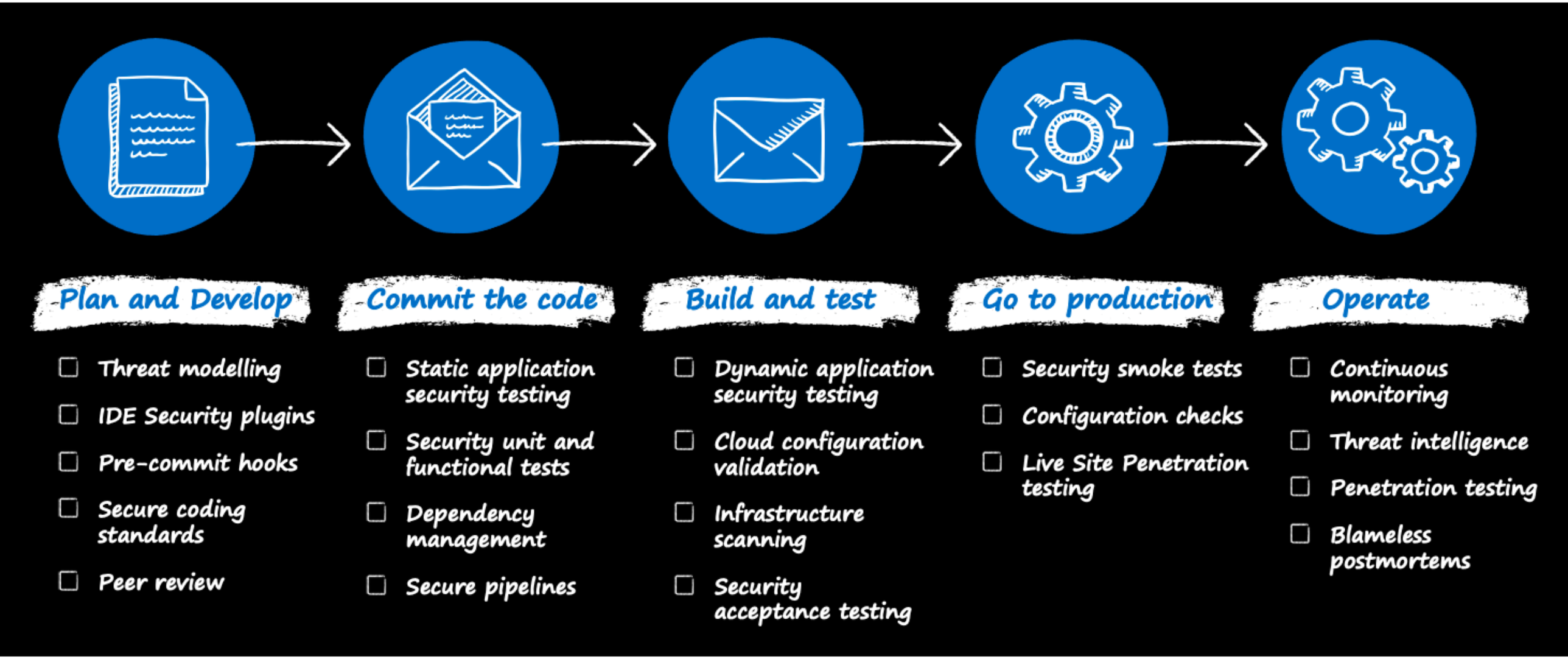
SDLC with Secure



SDLC with Secure

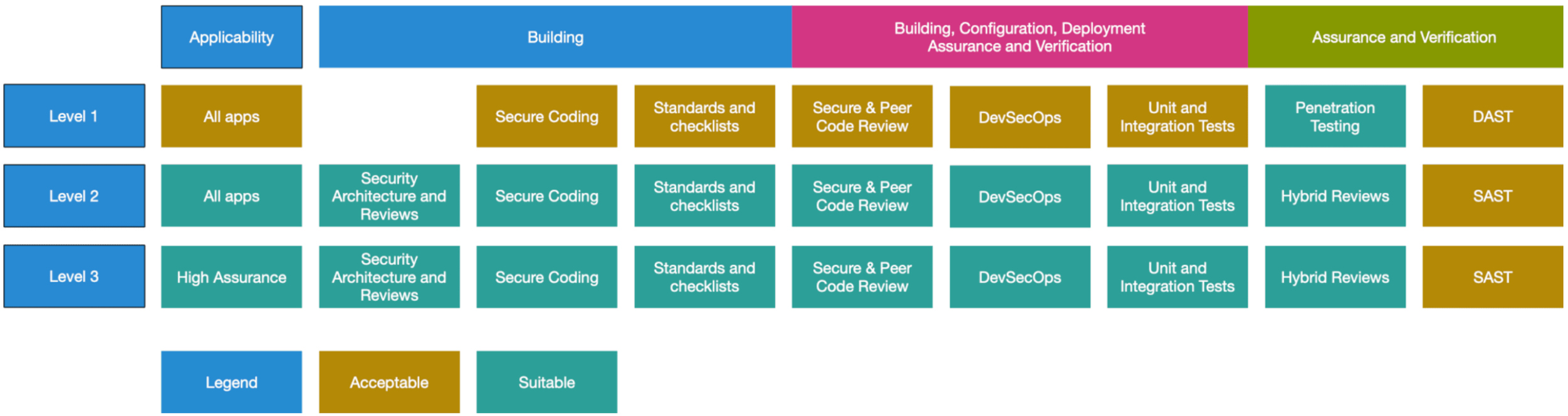


SDLC with Secure



https://learn.microsoft.com/en-us/azure/cloud-adoption-framework/secure/devsecops-controls

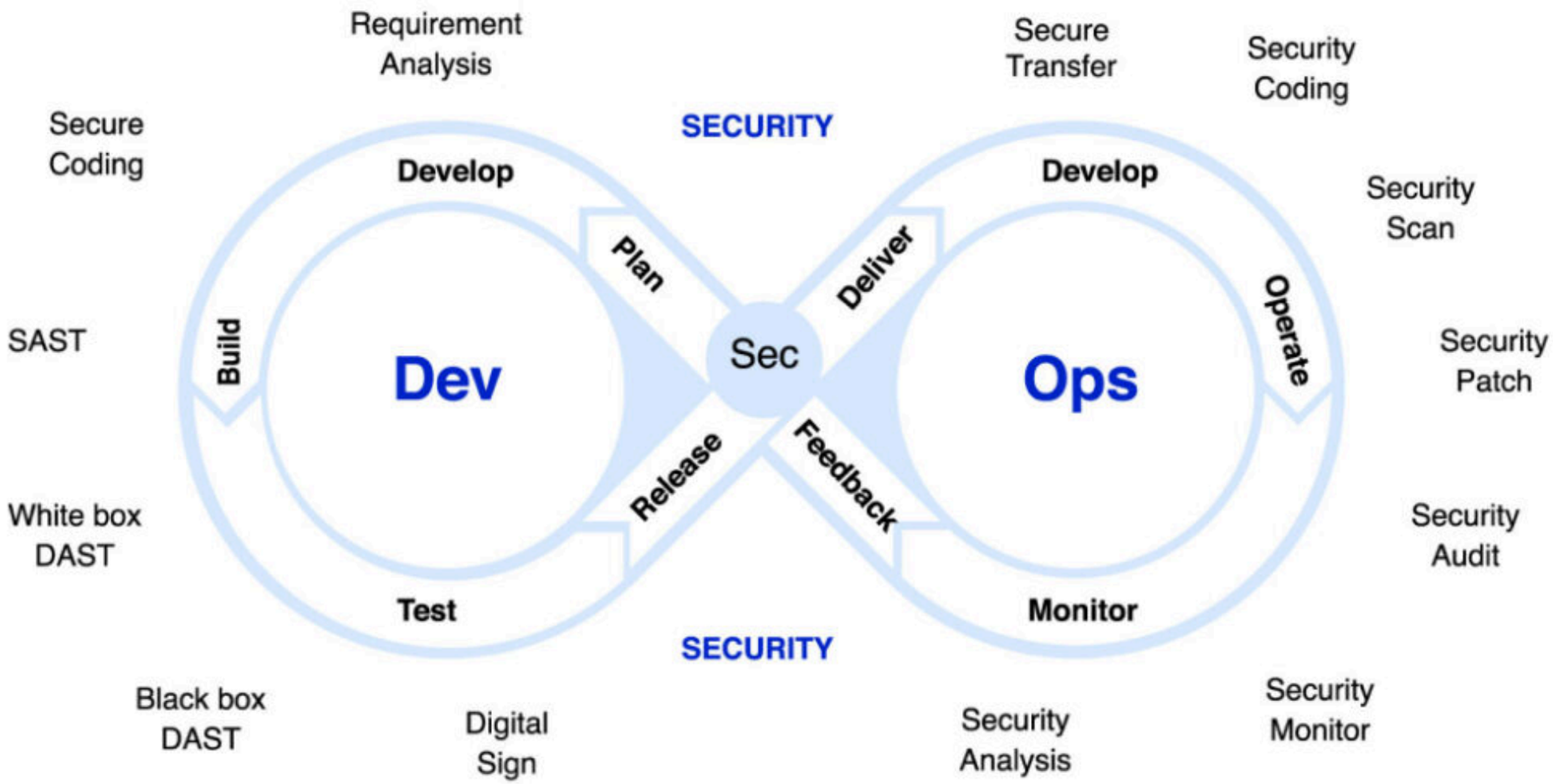
Application Security Verification Standard (ASVS)



https://owasp.org/www-project-application-security-verification-standard/

DevSecOps

Continuous improvement process
Plan-Do-Check-Act



Start with Requirements !!

Share and focus on security requirement

Security Checklist	Secure Coding standard	Application security guidelines

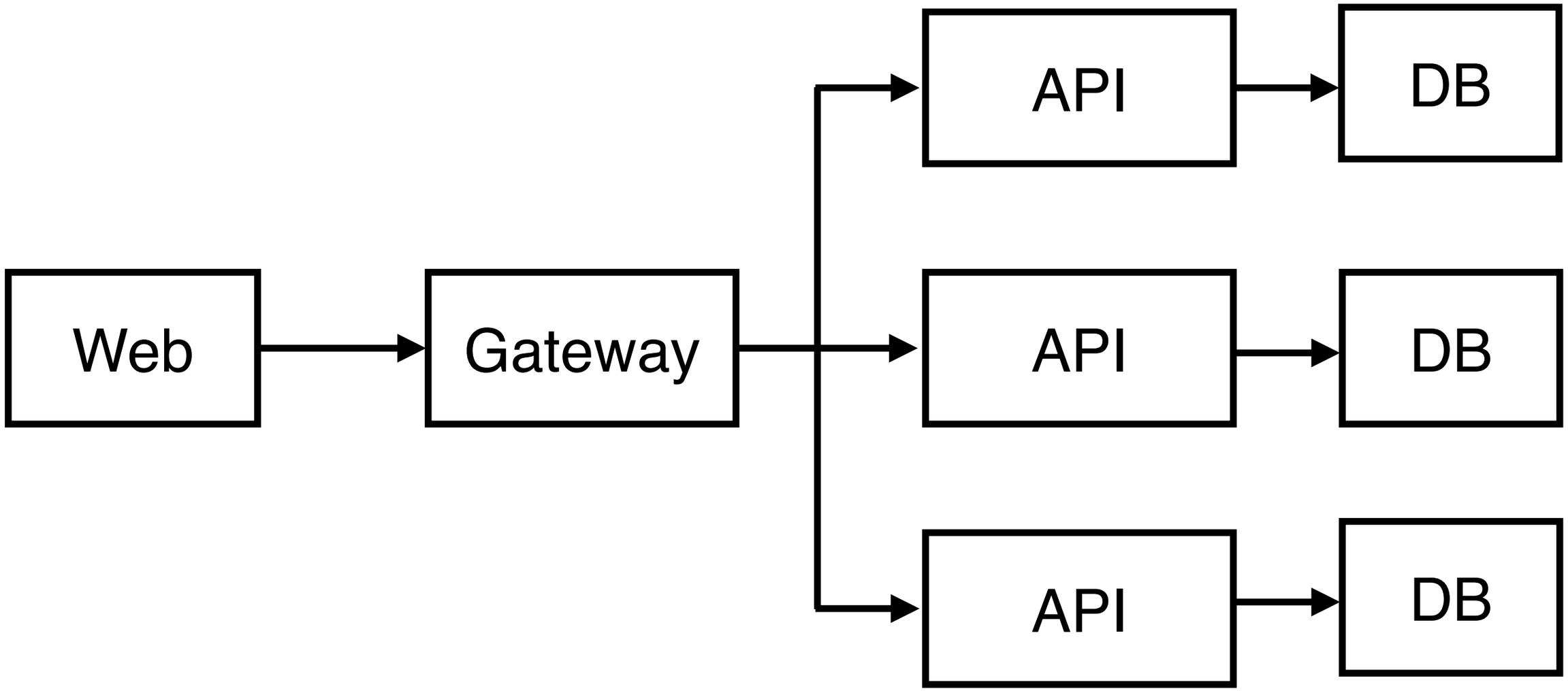
Secure Coding Standard

Avoid vulnerabilities
Focus on Web and API security

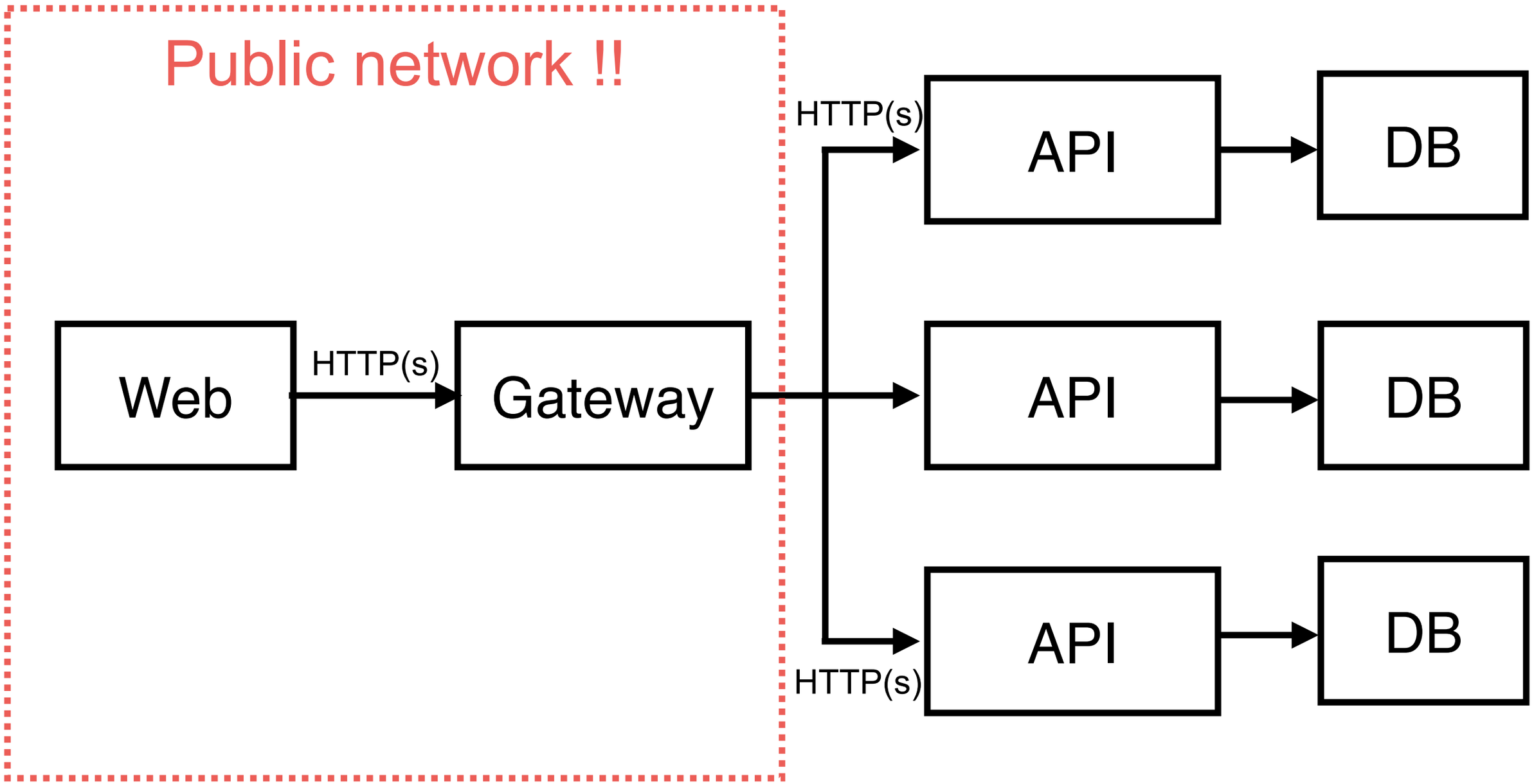
Web	**API**
OWASP Top 10	

SANS
20 software errors

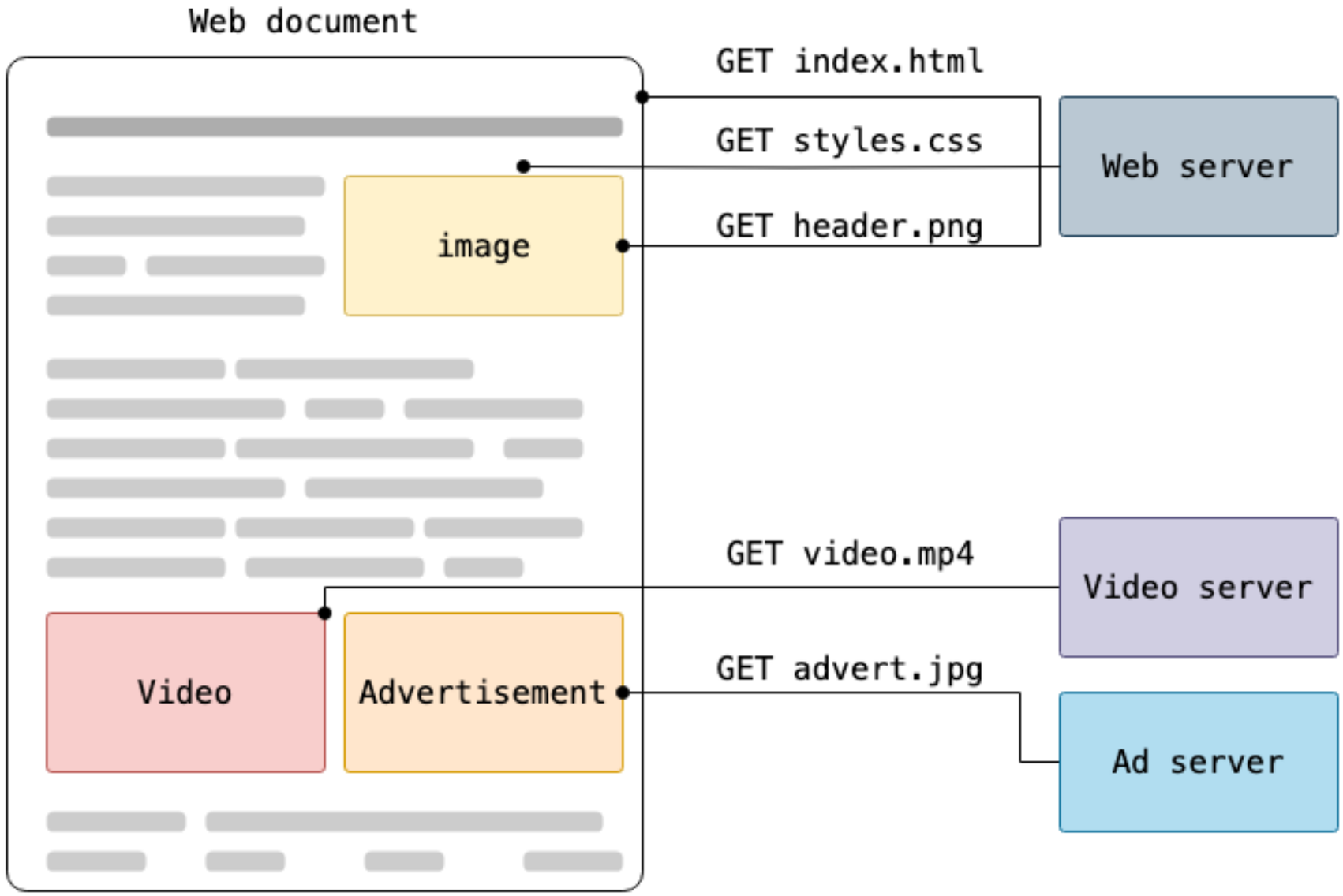
Software Architecture



Software Architecture + Network

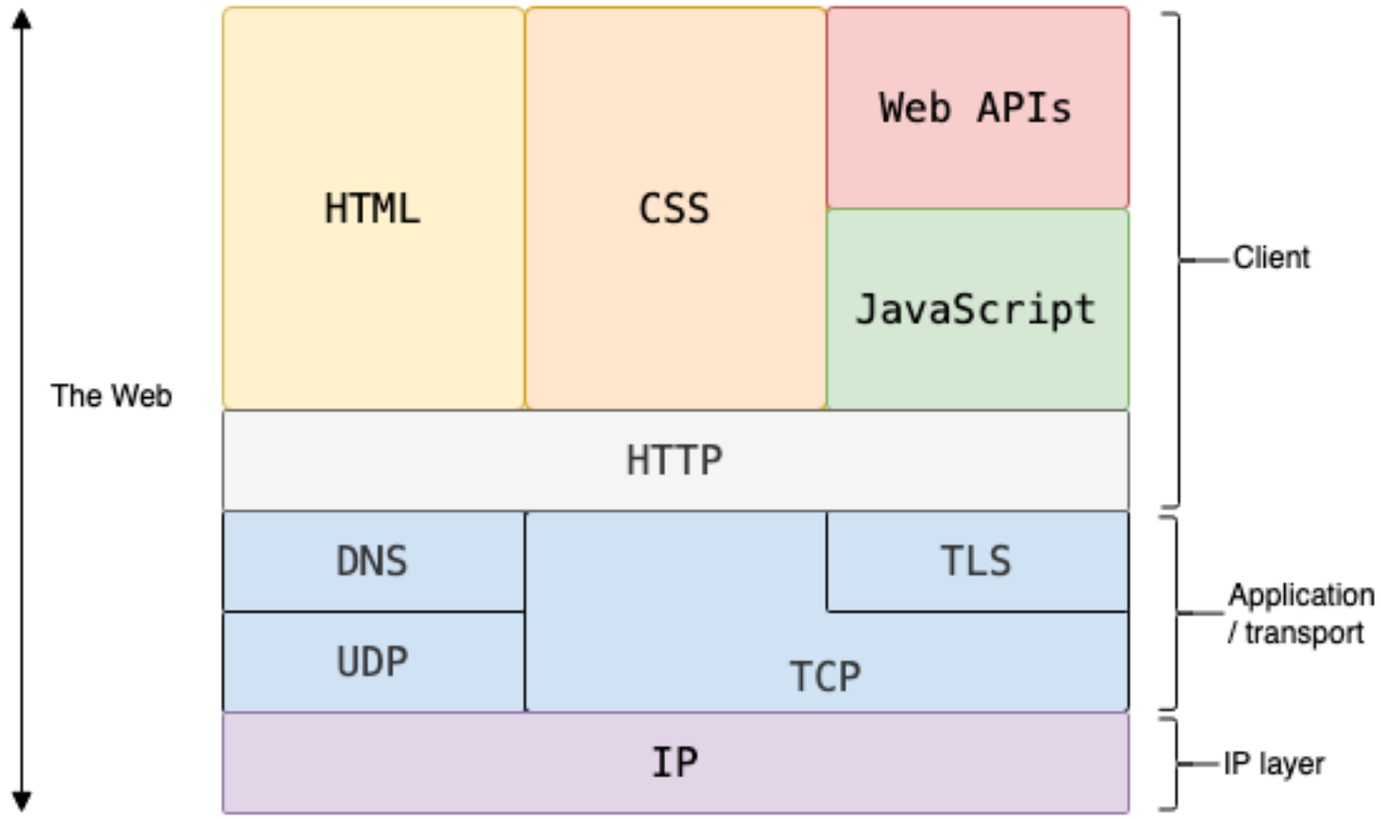


Overview of HTTP



https://developer.mozilla.org/en-US/docs/Web/HTTP/Overview

Overview of HTTP



https://developer.mozilla.org/en-US/docs/Web/HTTP/Overview

Structure of HTTP

Request

Method Path Protocol version

```
GET / HTTP/1.1
Host: developer.mozilla.org
Accept-Language: fr
```

Headers

Response

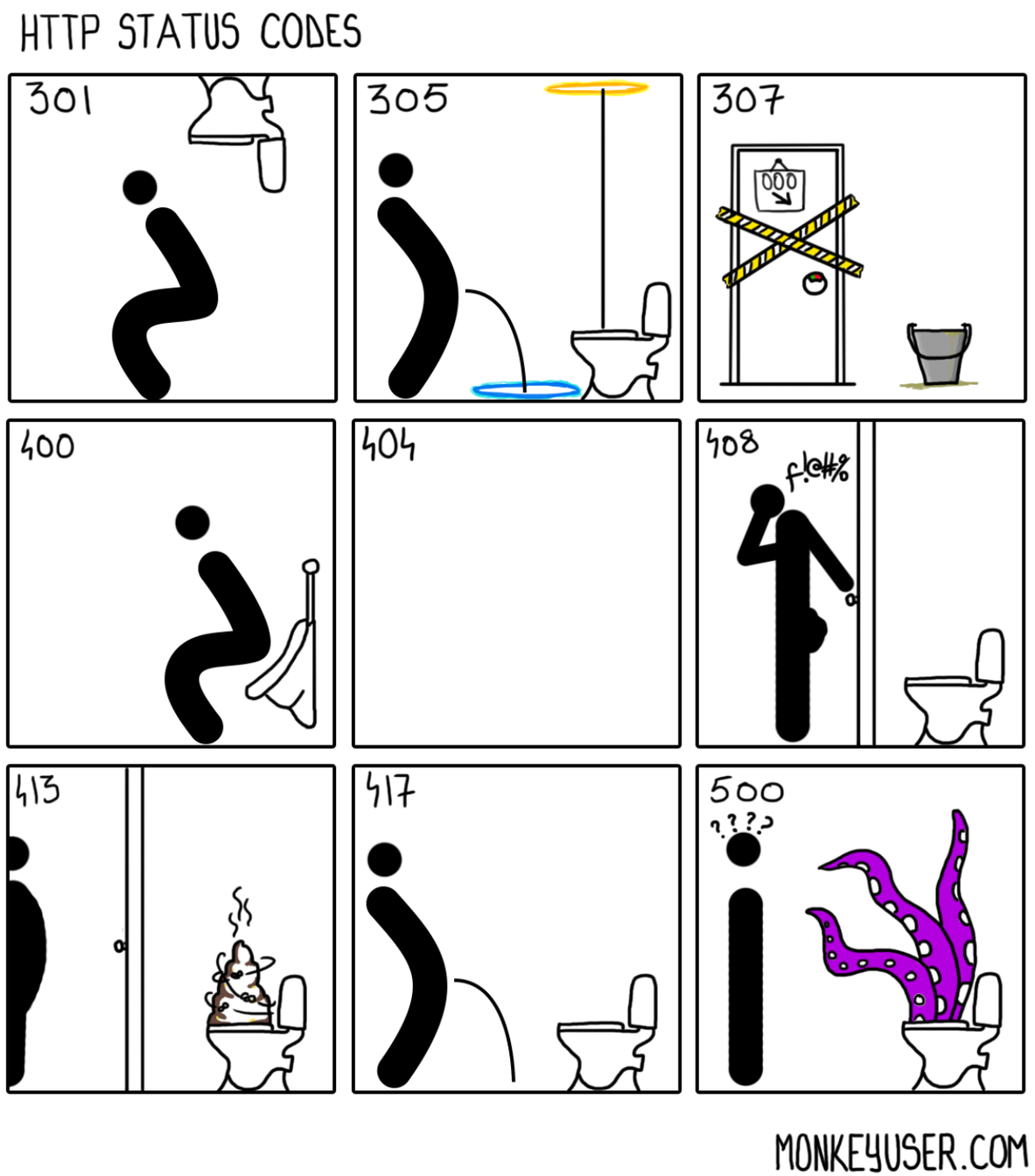
Protocol version Status code Status message

```
HTTP/1.1 200 OK
date: Tue, 18 Jun 2024 10:03:55 GMT
cache-control: public, max-age=3600
content-type: text/html
```

Headers

https://developer.mozilla.org/en-US/docs/Web/HTTP/Overview

HTTP response status code

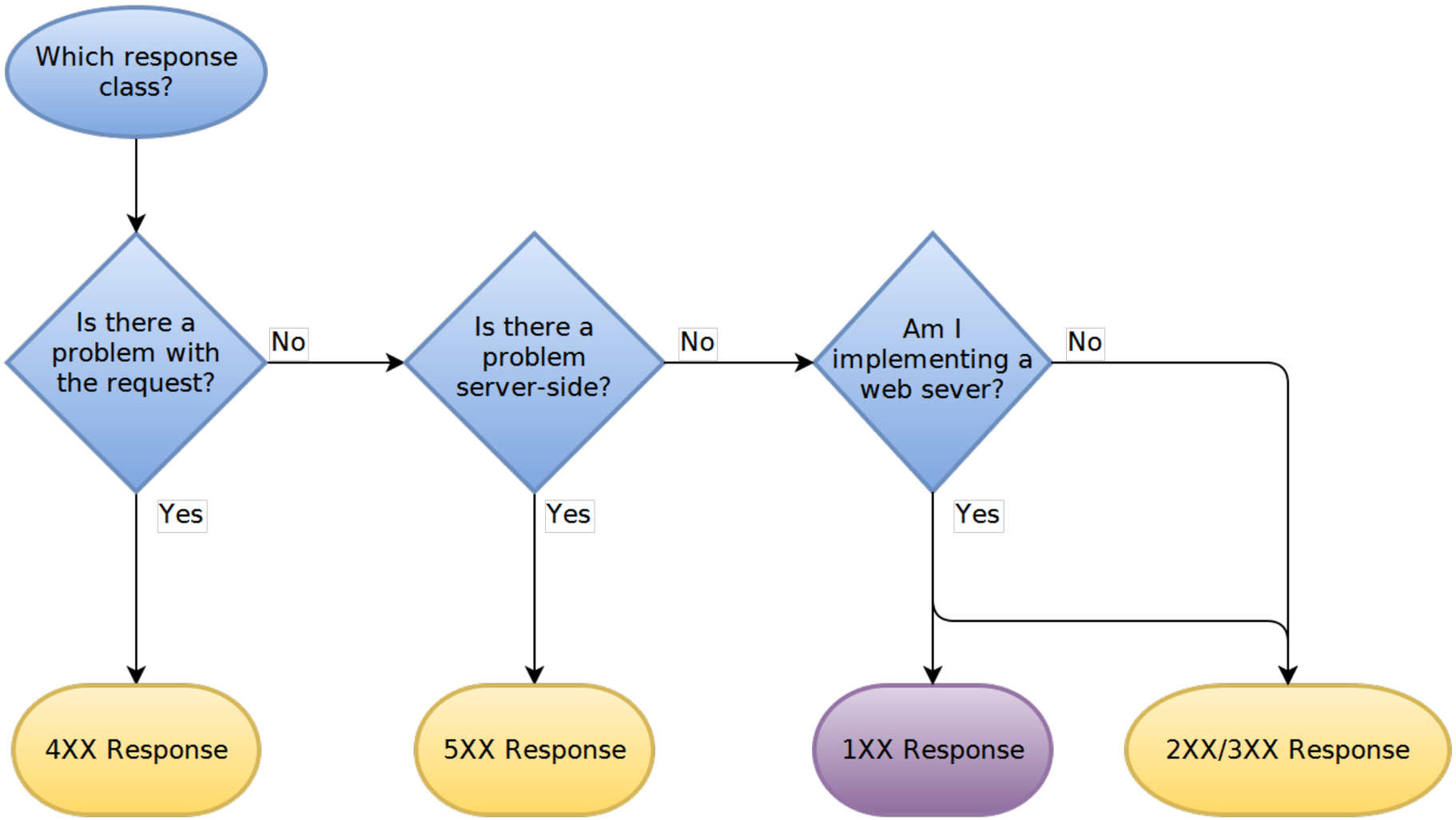


HTTP response status code

Status Code	Description
1xx	Informational response
2xx	Successful response
3xx	Redirection message
4xx	Client error response
5xx	Server error response

https://developer.mozilla.org/en-US/docs/Web/HTTP/Status

How to choose code ?

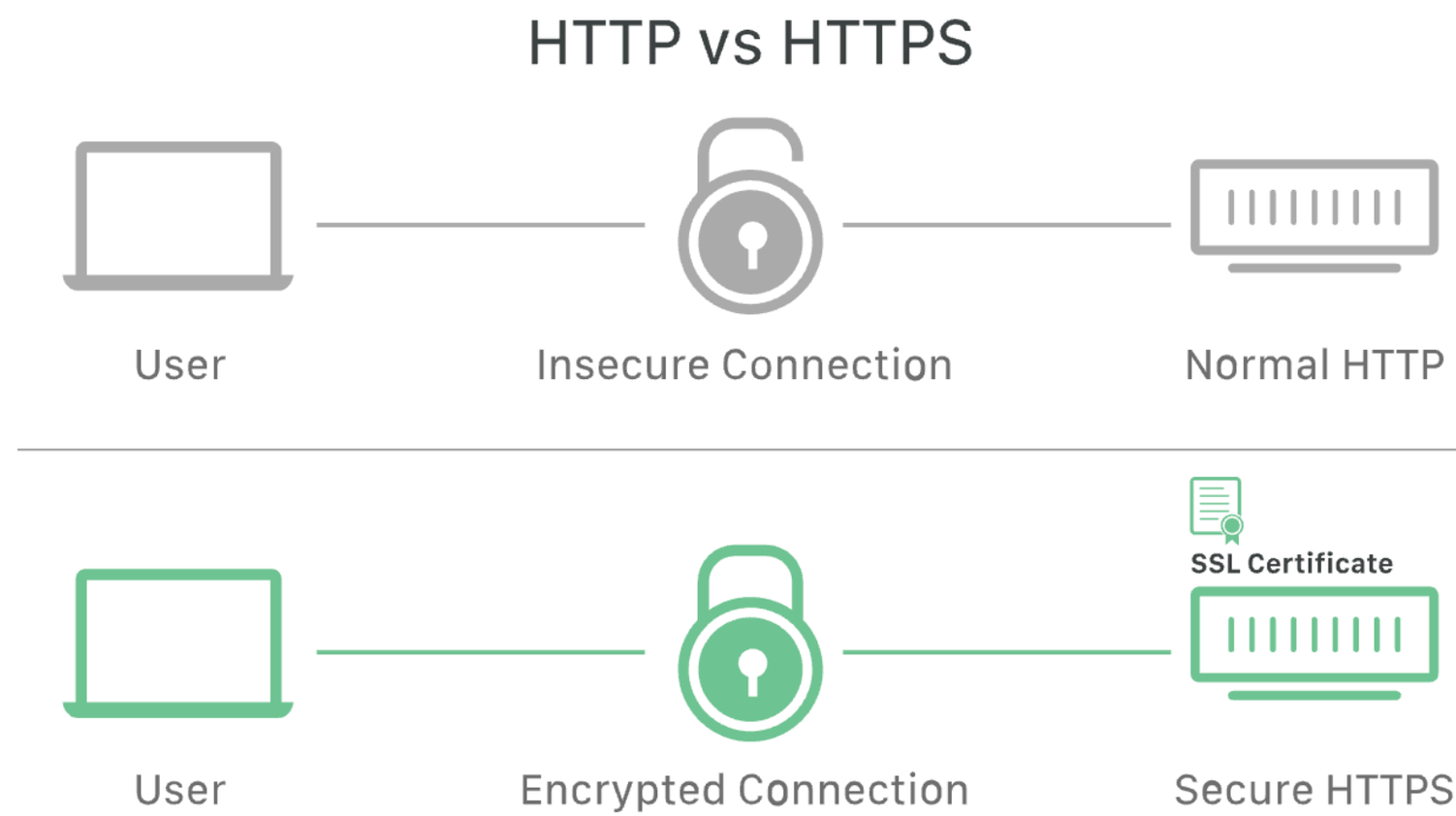


https://www.codetinkerer.com/2015/12/04/choosing-an-http-status-code.html

HTTP vs HTTPS

HTTPS

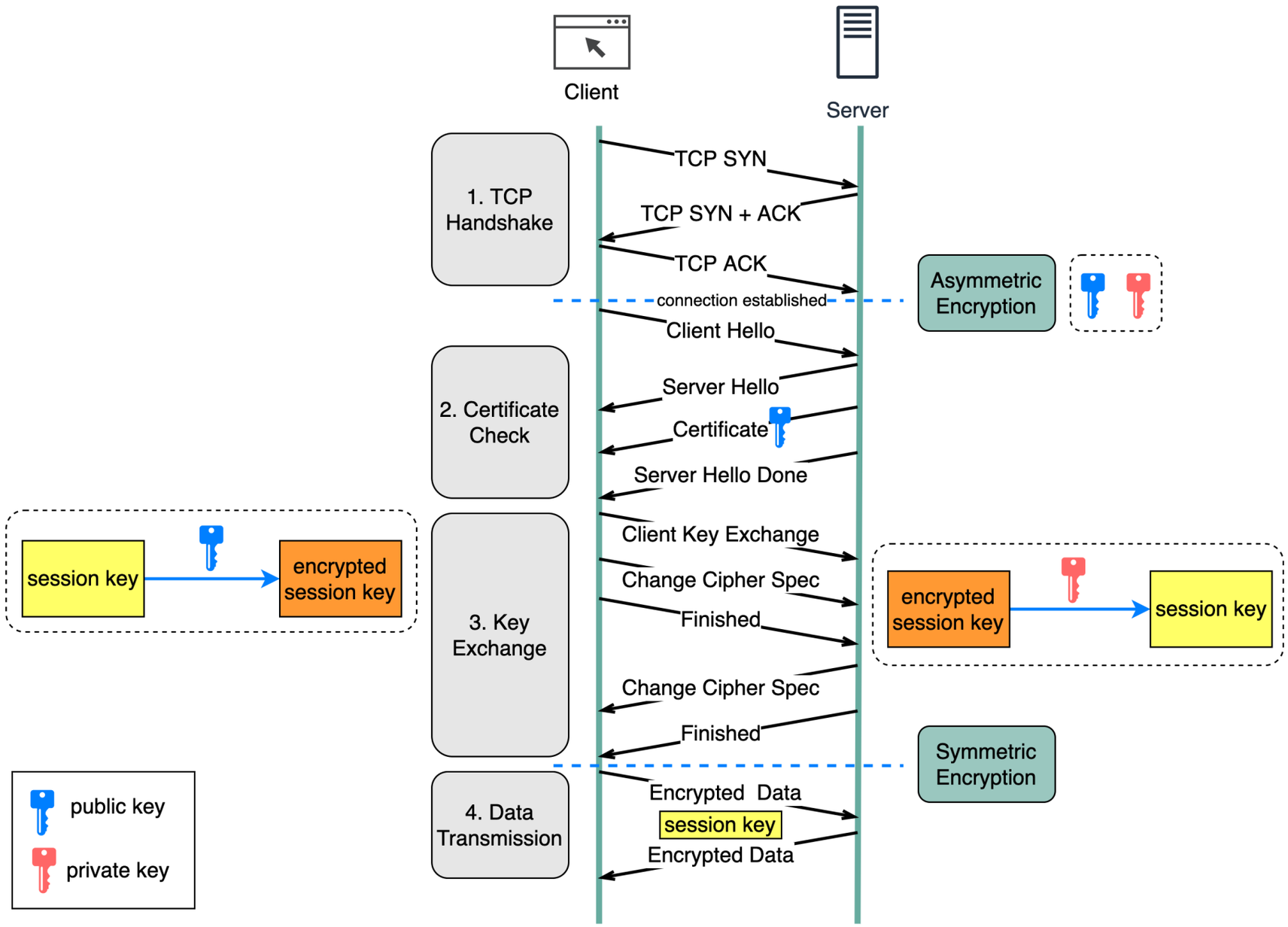
HTTP with encryption and verification



HTTPS works ?

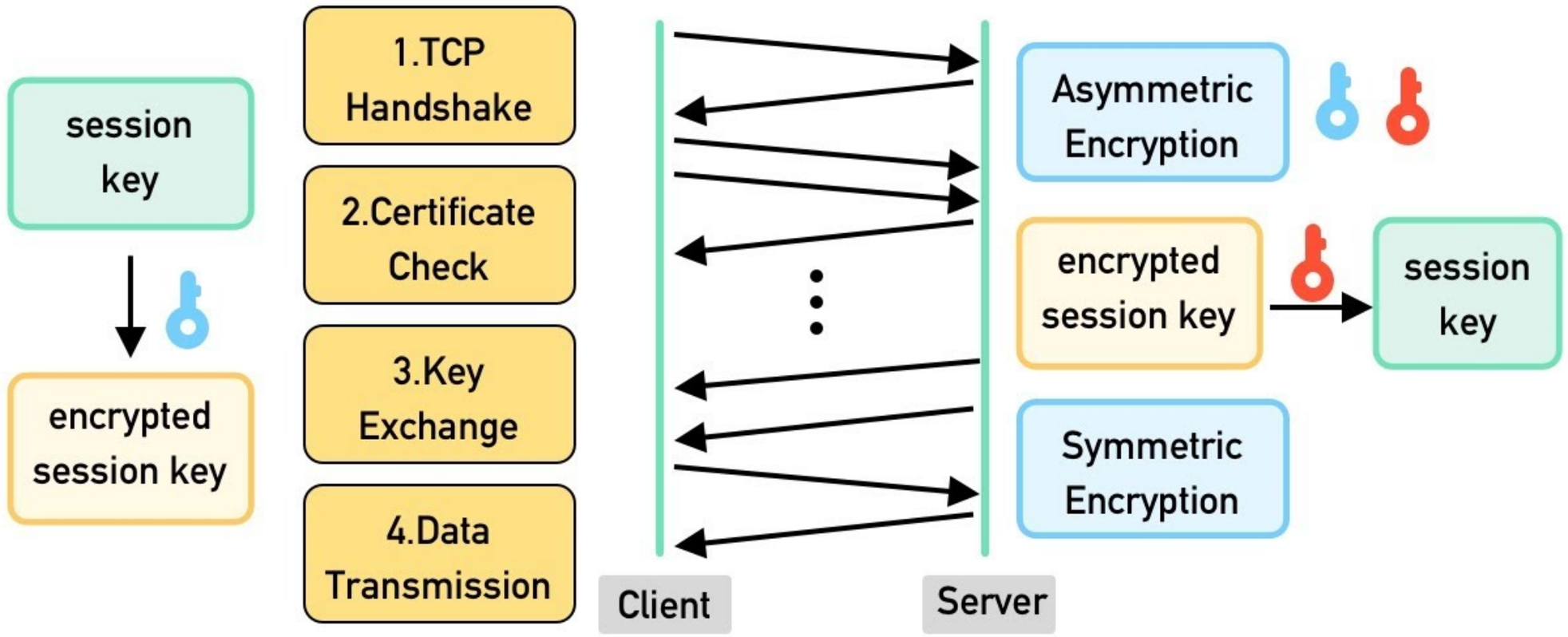
How does HTTPS Work?

blog.bytebytego.com



https://blog.bytebytego.com/p/how-does-https-work-episode-6

How Does HTTPS Work?



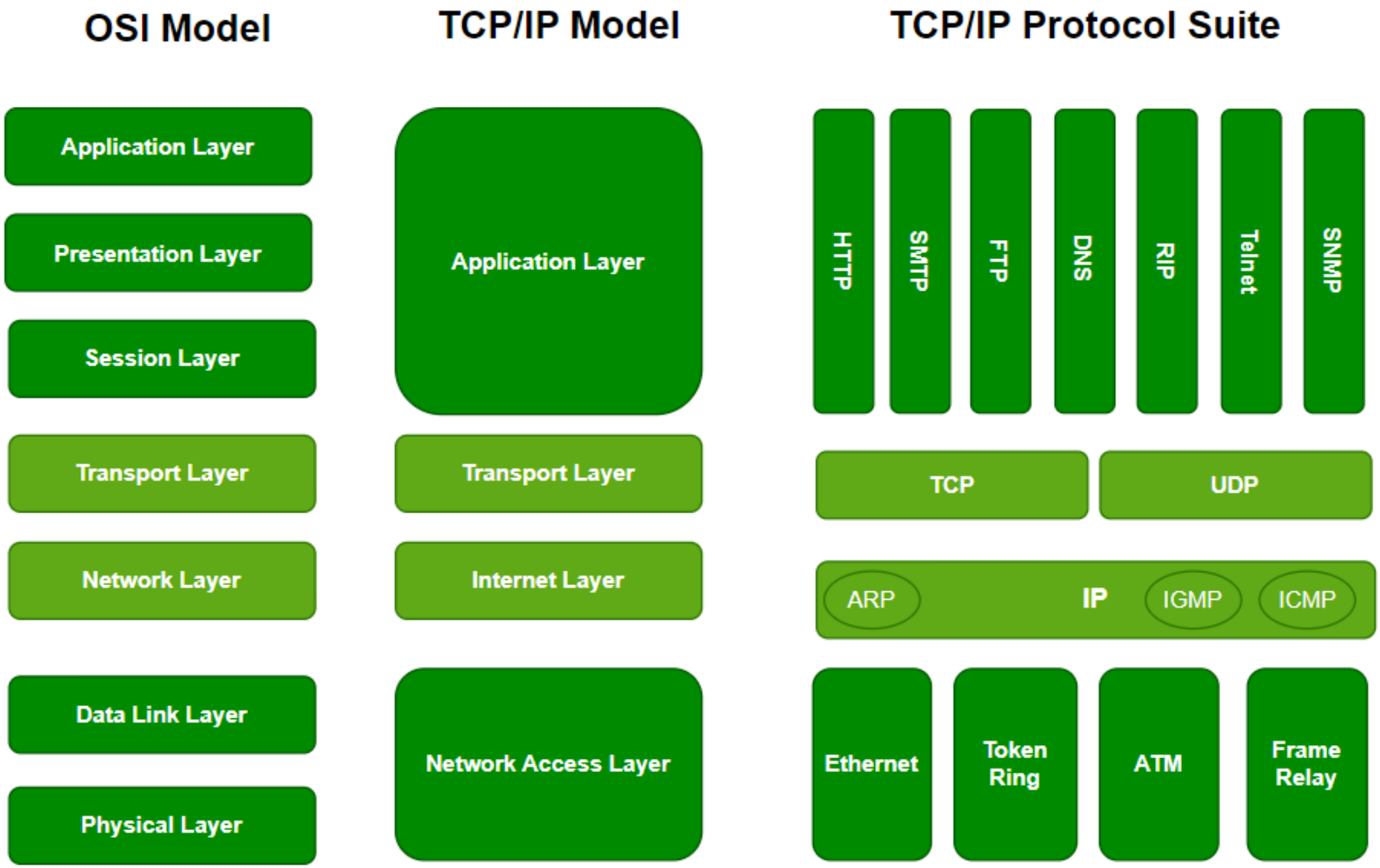
https://blog.bytebytego.com/p/how-does-https-work-episode-6

HTTP vs HTTPs

Feature	HTTP	HTTPS
OSI Layer	Application layer	Transport layer
Security	No encrypt	Encrypt using TLS/SSL
Port	80	443
Data encryption	No	Yes
Authentication	No, prone to MITM attacks	Use SSL/TLS certificates
Data integrity		
Performance	Faster	Slower with encryption, improve in HTTP/2

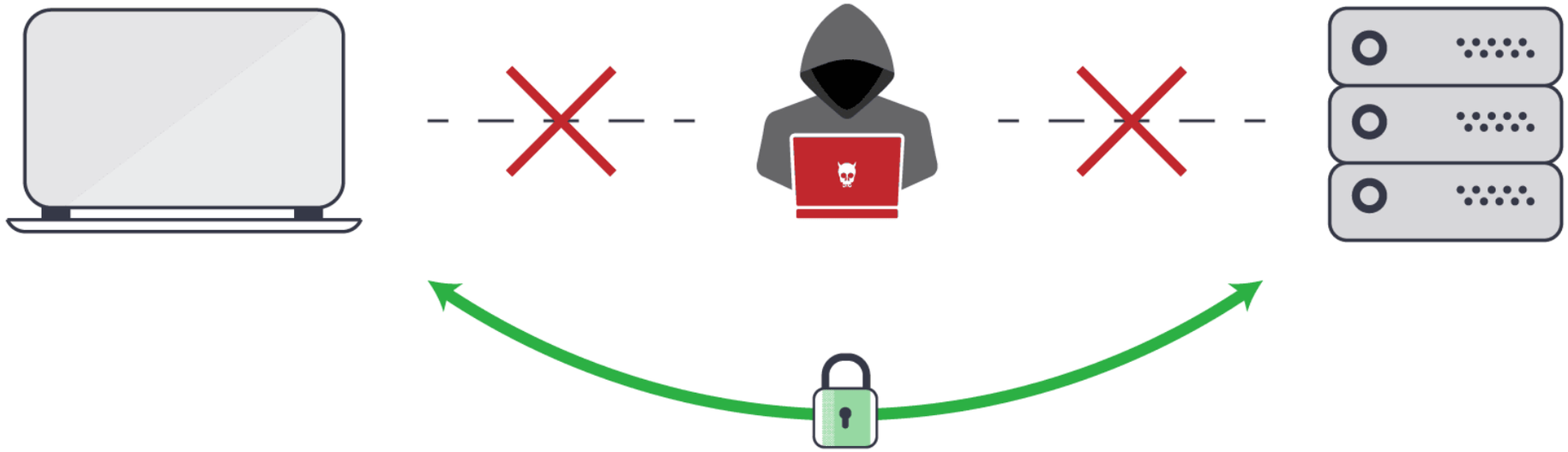
https://www.geeksforgeeks.org/explain-working-of-https/

OSI Model



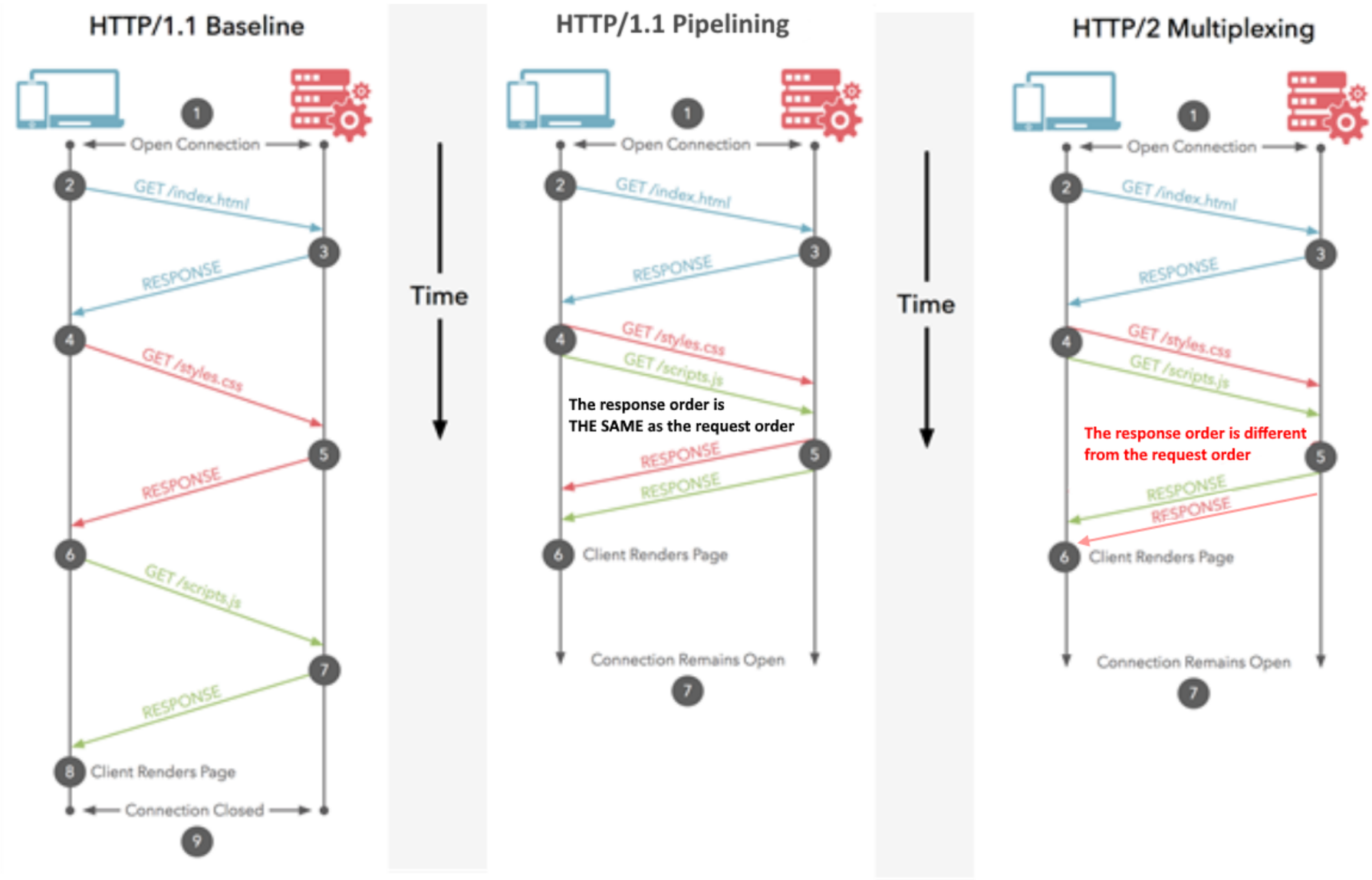
https://www.geeksforgeeks.org/difference-between-osi-model-and-tcp-ip-model/

Man-in-the-Middle



HTTP/2

Try to solve problem in HTTP 1

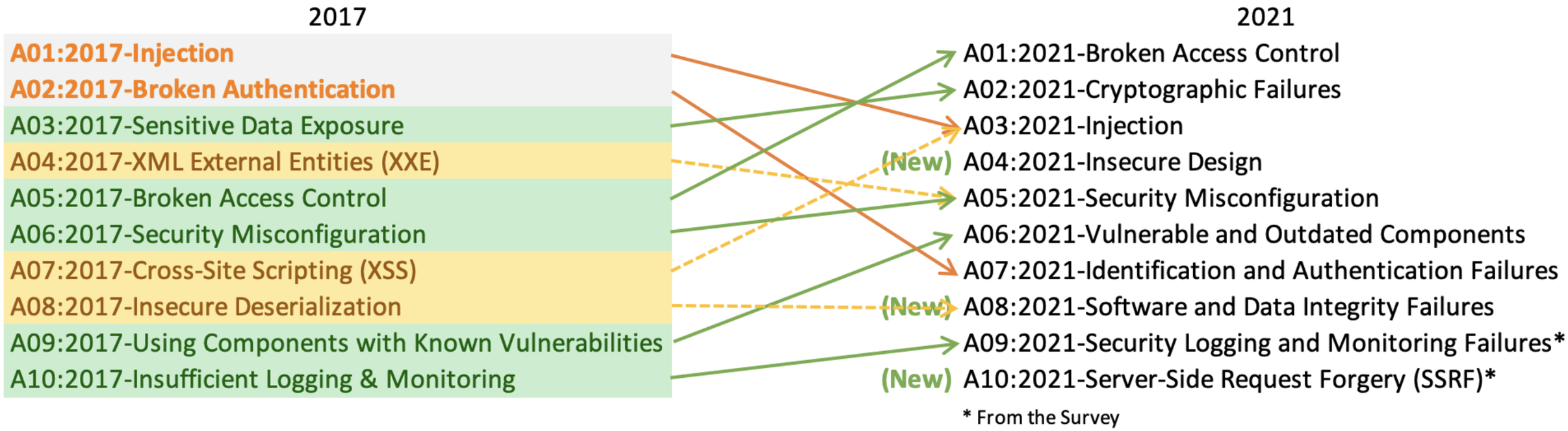


Security Guideline ?

TOP 10

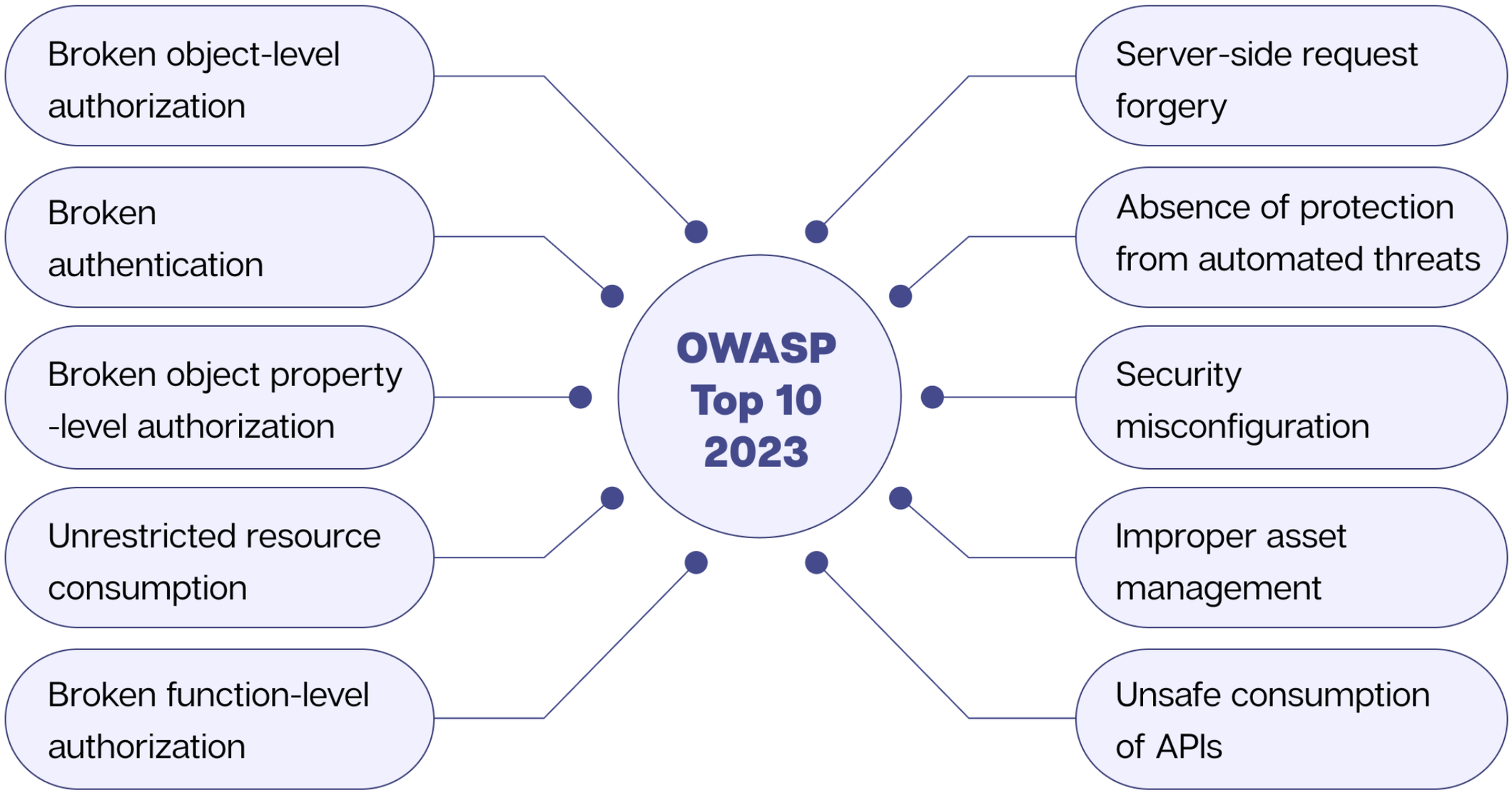
https://owasp.org/Top10/

OWASP Top 10

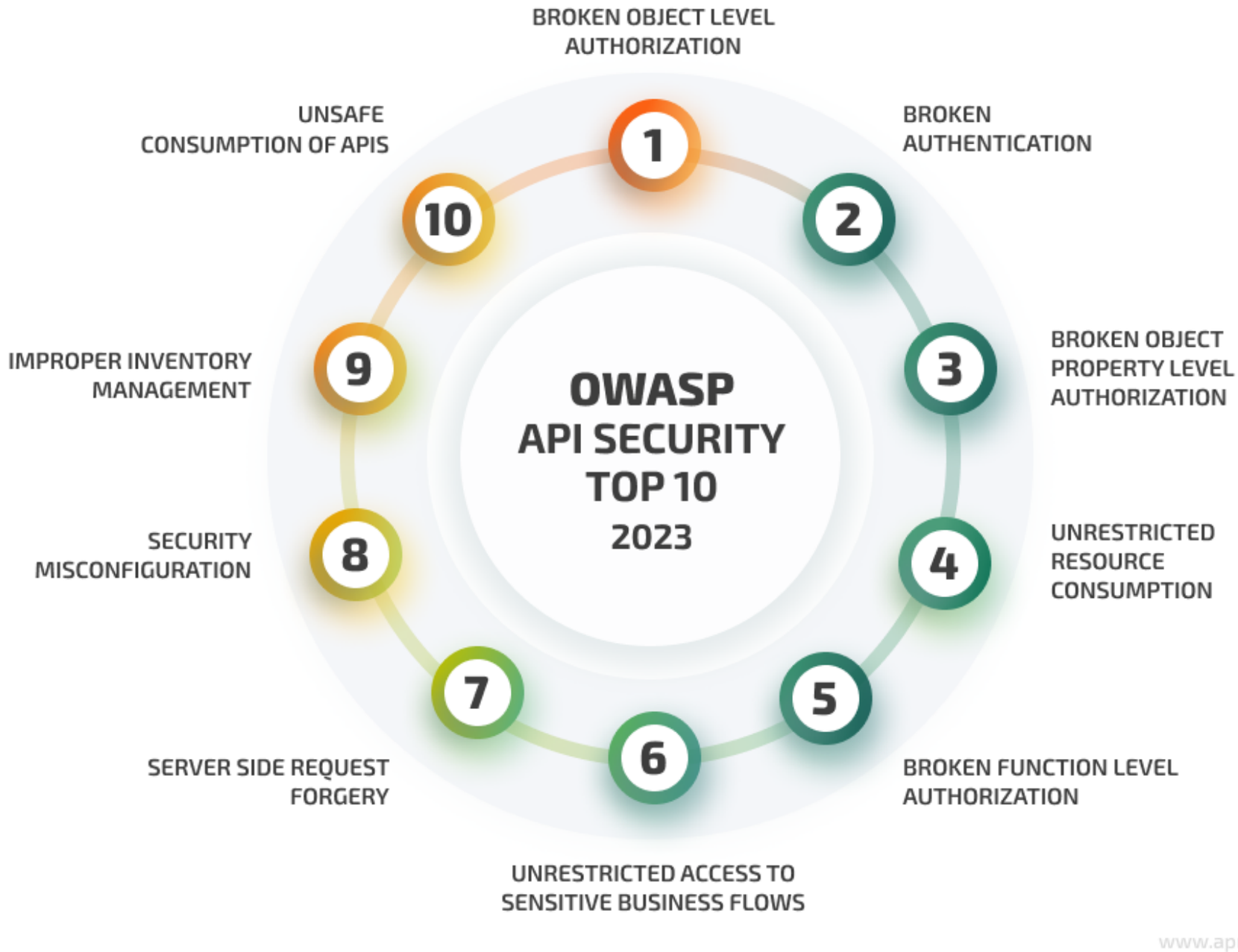


https://owasp.org/API-Security/editions/2023/en/0x11-t10/

OWASP Top 10 2023



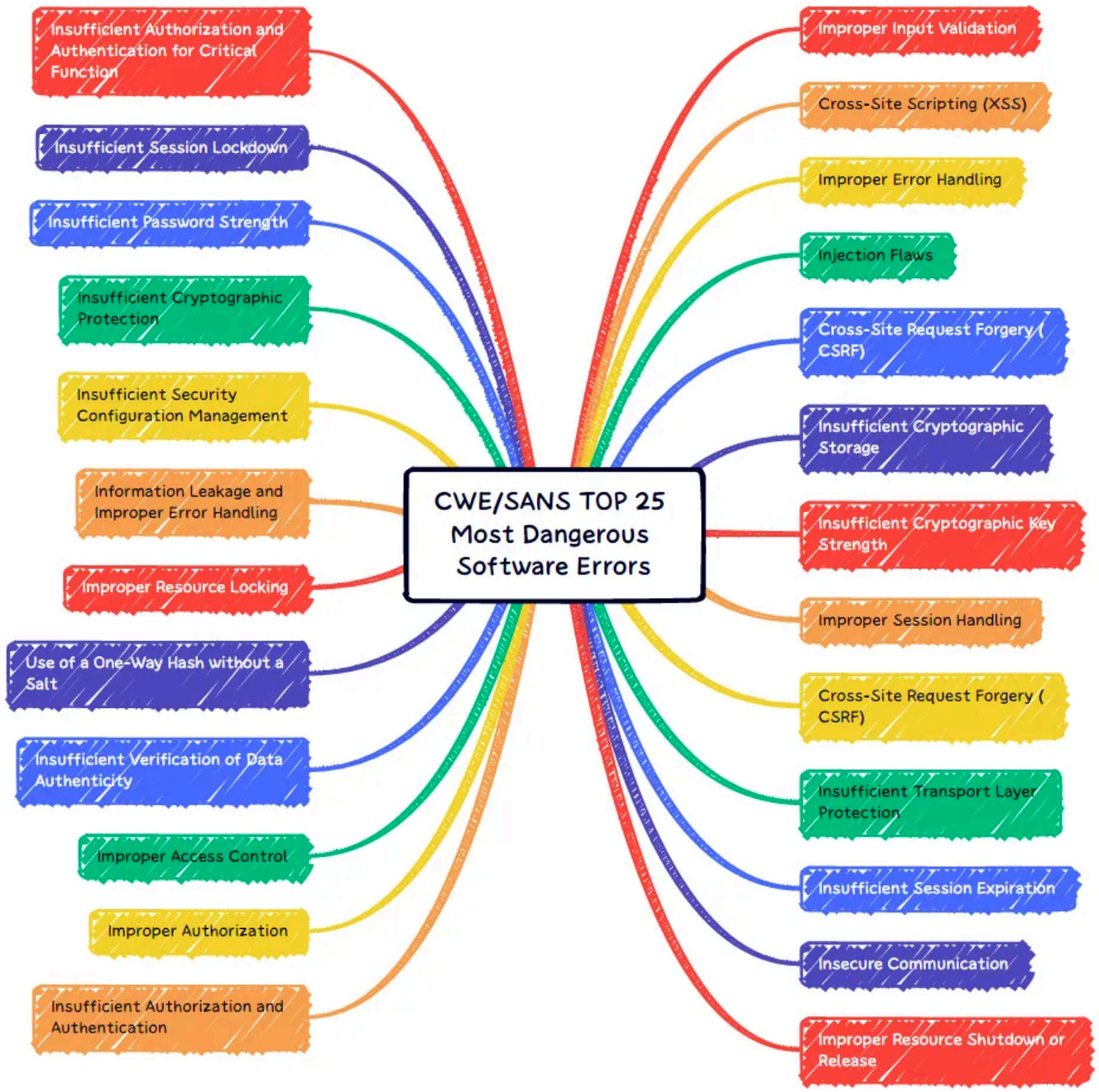
https://owasp.org



https://owasp.org/API-Security/editions/2023/en/0x11-t10/

https://owasp.org/www-project-mobile-top-10/

CWE/SANS Top 25 Errors



https://cwe.mitre.org/top25/

More …

Access administration
Authentication and authorization
Logging and monitoring system

A01
Broken Access Control

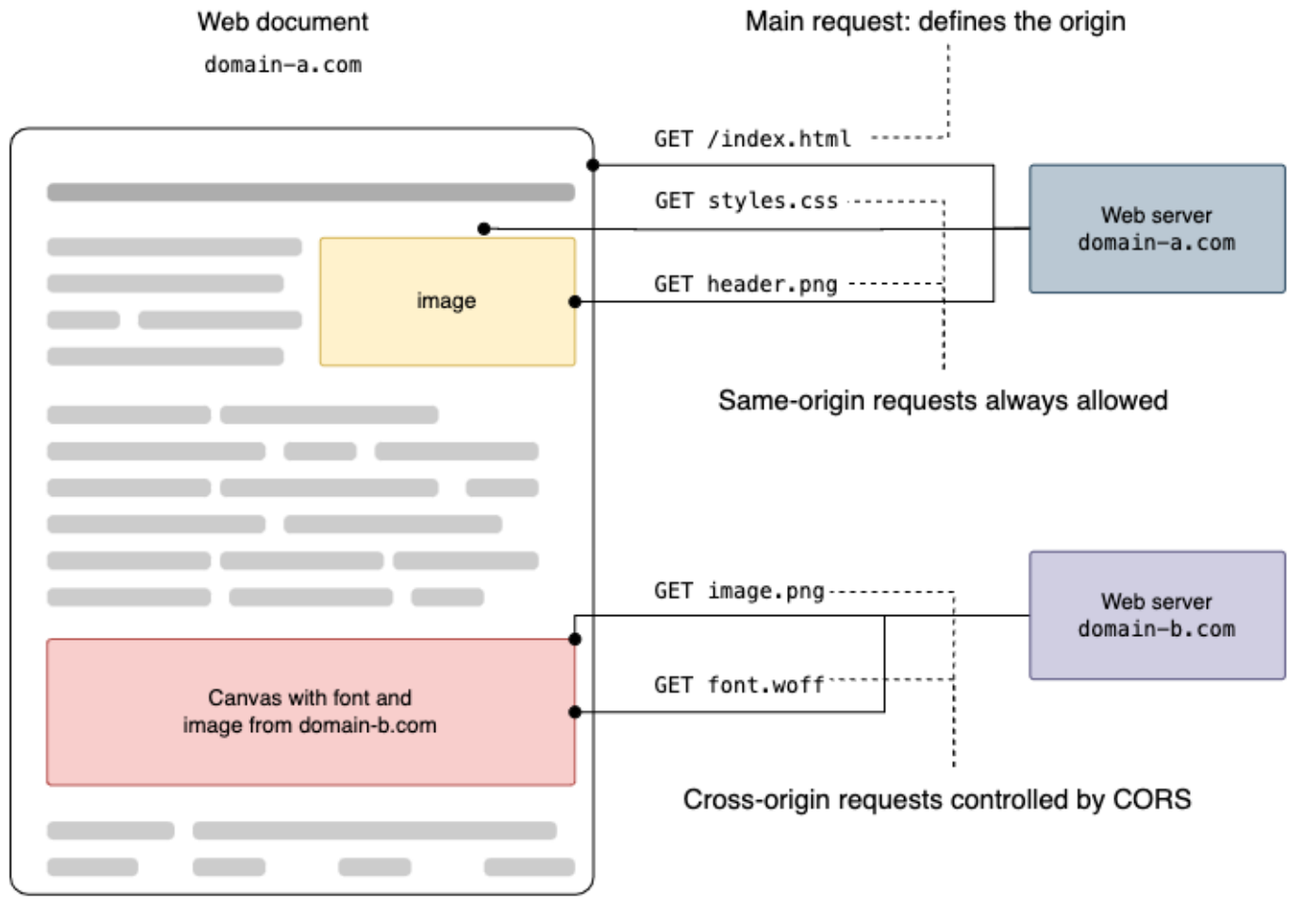
https://owasp.org/Top10/A01_2021-Broken_Access_Control/

Broken Access Control

Violation of the principle of least privilege
Bypassing access control
Access API with mission access control
CORS misconfiguration
CORS allows untrusted origin

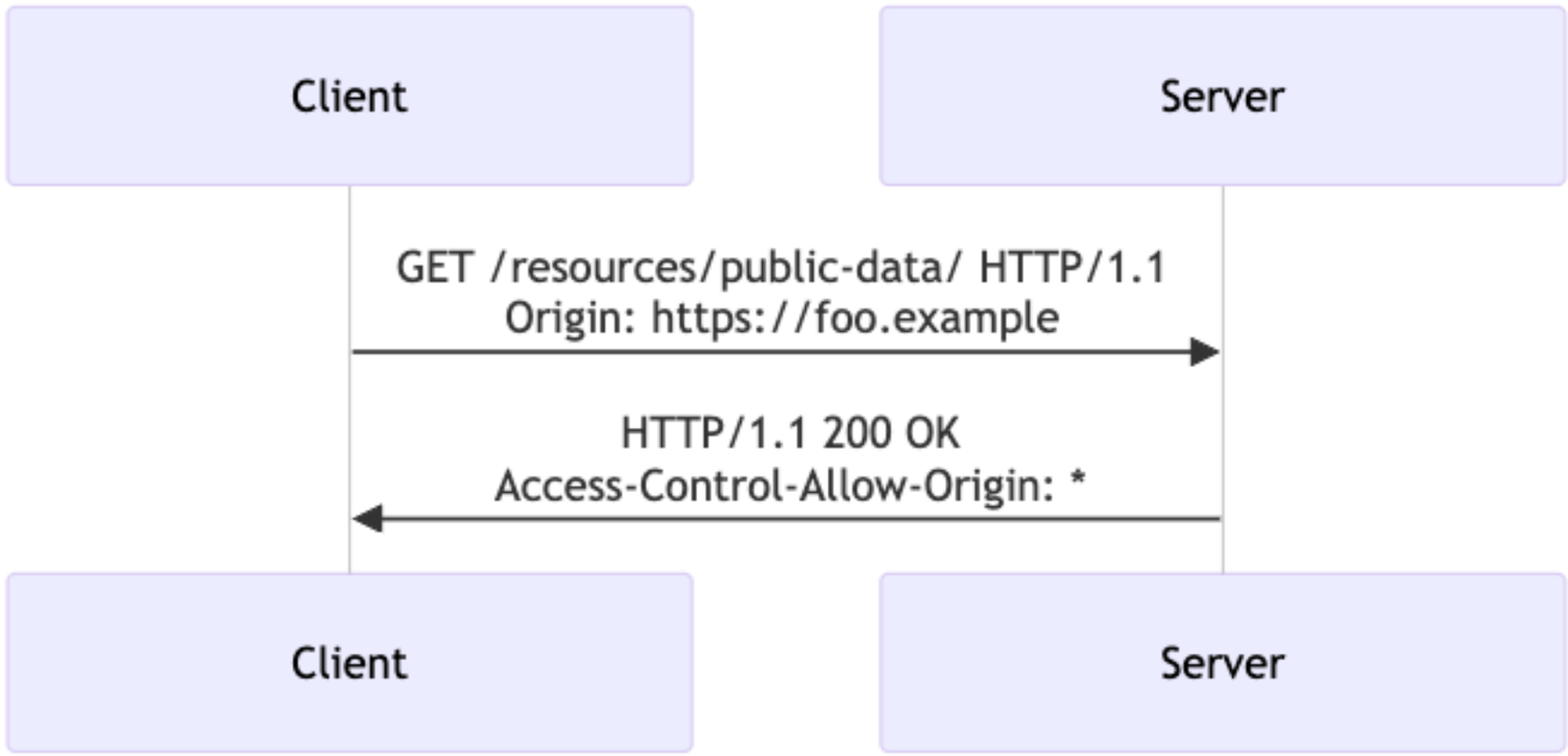
CORS

Cross-Origin Resource Sharing
HTTP-header based mechanism
Allow server to indicate any origin (domain, port)



https://developer.mozilla.org/en-US/docs/Web/HTTP/CORS

CORS



https://developer.mozilla.org/en-US/docs/Web/HTTP/CORS

CORS

Request from browser

```
GET /resources/public-data/ HTTP/1.1
Host: bar.other
User-Agent: xxx
Accept-Language: en-us,en;q=0.5
Accept-Encoding: gzip,deflate
Connection: keep-alive
Origin: https://foo.example
```

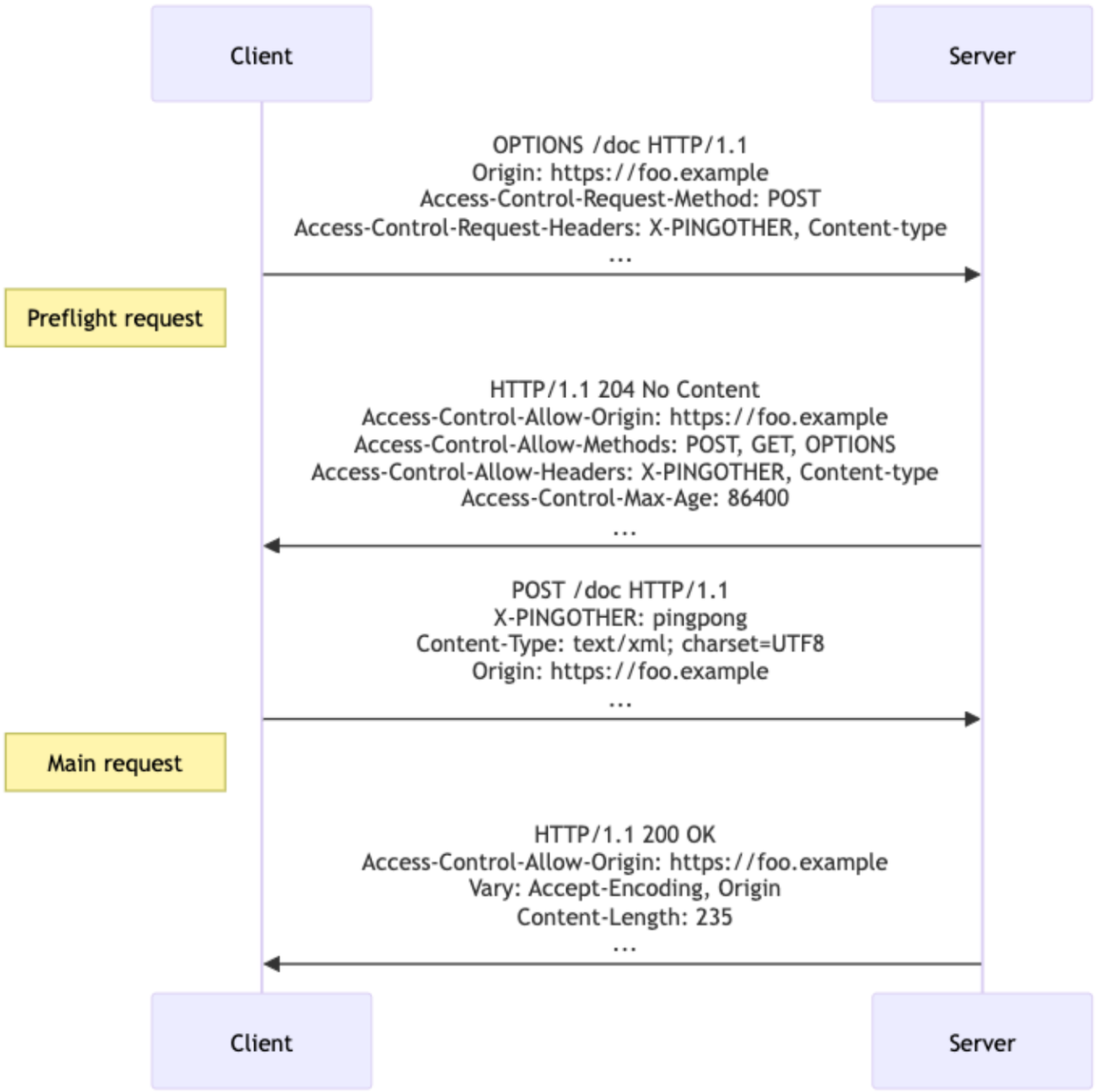
Response from server

```
HTTP/1.1 200 OK
Server: Apache/2
Access-Control-Allow-Origin: *
Keep-Alive: timeout=2, max=100
Connection: Keep-Alive
Transfer-Encoding: chunked
Content-Type: application/json

[… Data…]
```

https://developer.mozilla.org/en-US/docs/Web/HTTP/CORS

CORS with preflight request



https://developer.mozilla.org/en-US/docs/Web/HTTP/CORS#preflighted_requests

Workshop

Working with CORS

Broken Access Control

Expose sensitive information to unauthorized user
Insertion of sensitive information to sent data
Cross-Site Request Forgery (CSRS)

Required

User should only act based on specific permission
Incorrect permission -> unauthorized access

How to prevent ?

Deny access by default
Avoid duplication of access control log
Enforce **user ownership** when manipulating data

Workshop

Broken Access Control !!

GET /profile?username=alice

GET /profile?username=bob

Potential Security Issues

SQL Injection

Authentication

Input validation

Data exposure

Dependency security

Error handling

Solutions !!

Create and run automated test
Check JWT token in HTTP request header

Multiple factor authentication (MFA)	Strong password	Log all failed attempt

A02 :: Cryptographic Failure

https://owasp.org/Top10/A02_2021-Cryptographic_Failures/

Cryptographic Failure

Weak or inexistent **cryptography** of sensitive data
Anything protected by privacy laws or regulations

Password	Credit-card number	Personal information
Health record	Business secret	

Cryptographic Failure

Use plaintext protocol
Unsecured algorithms
Not. Check server certificate
Use simple random function
Wrong encryption key

Common mistake !!

Weak or outdated cryptographic algorithm

Common mistake !!

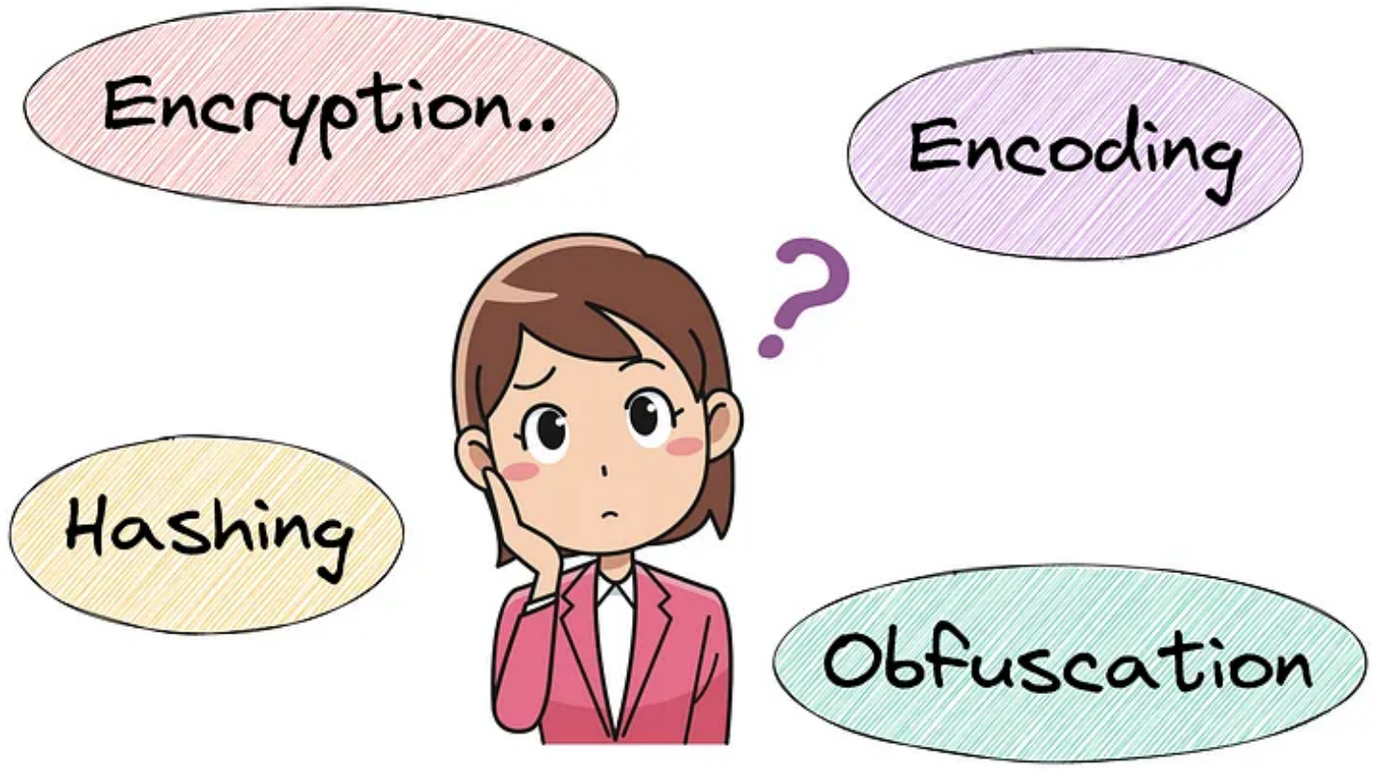
Weak secret keys, use default

Use keys from online tutorials

Lack of traffic encryption (HTTPS)

Insufficient entropy in seed generation

Encoding, Encryption, Hash ?

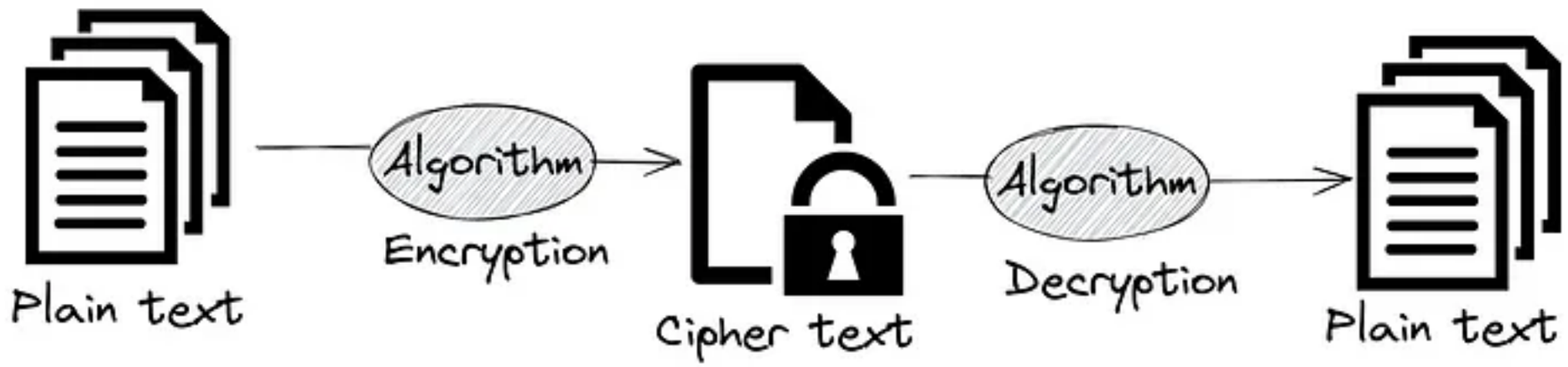


Encoding

Transform data from one format to another
Preserve data integrity
Not require key
Use for transmission and storage

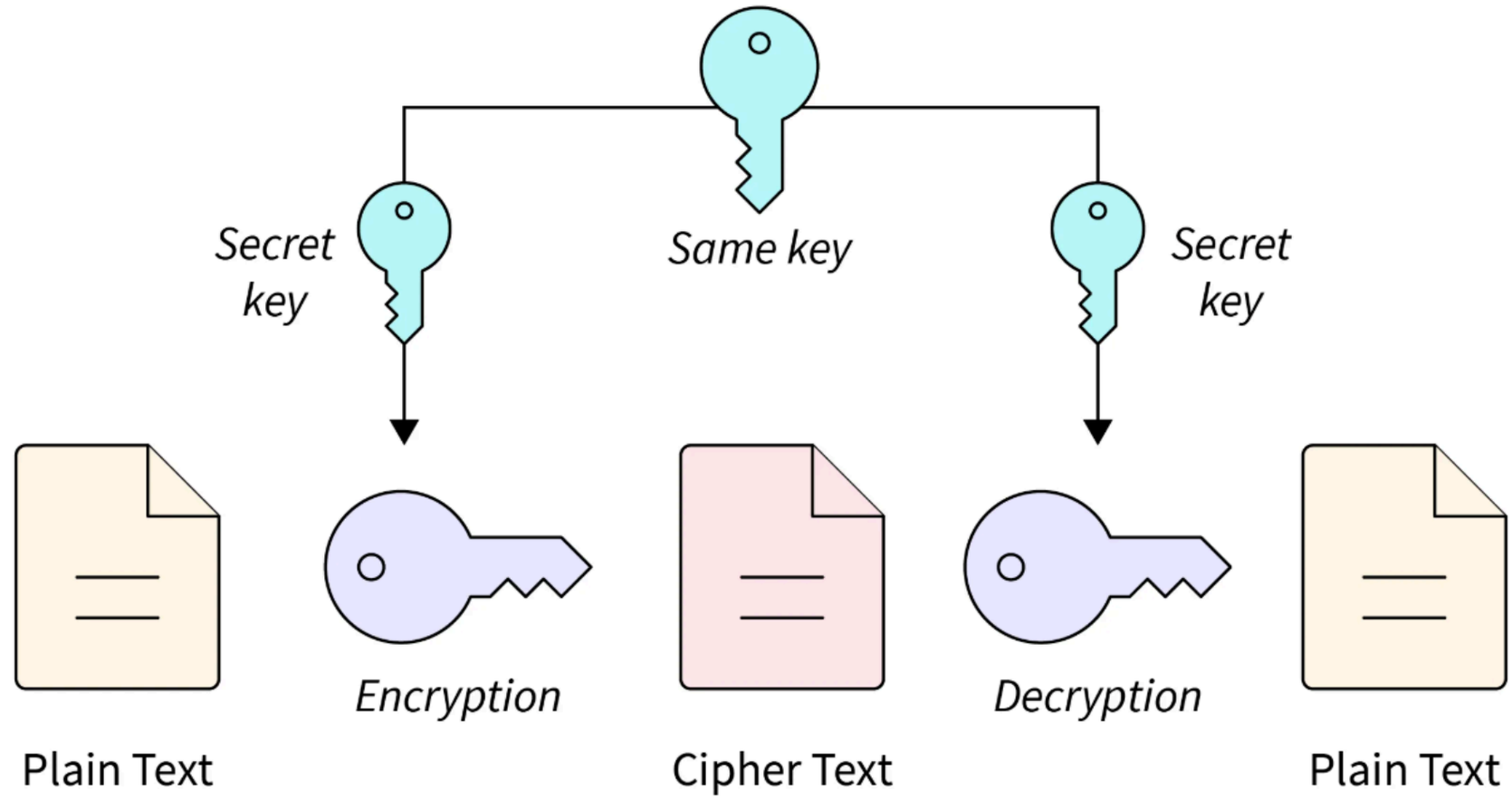
Encryption

Secure way of encoding data
Protect data confidentiality, privacy
Require key to encrypt and decrypt

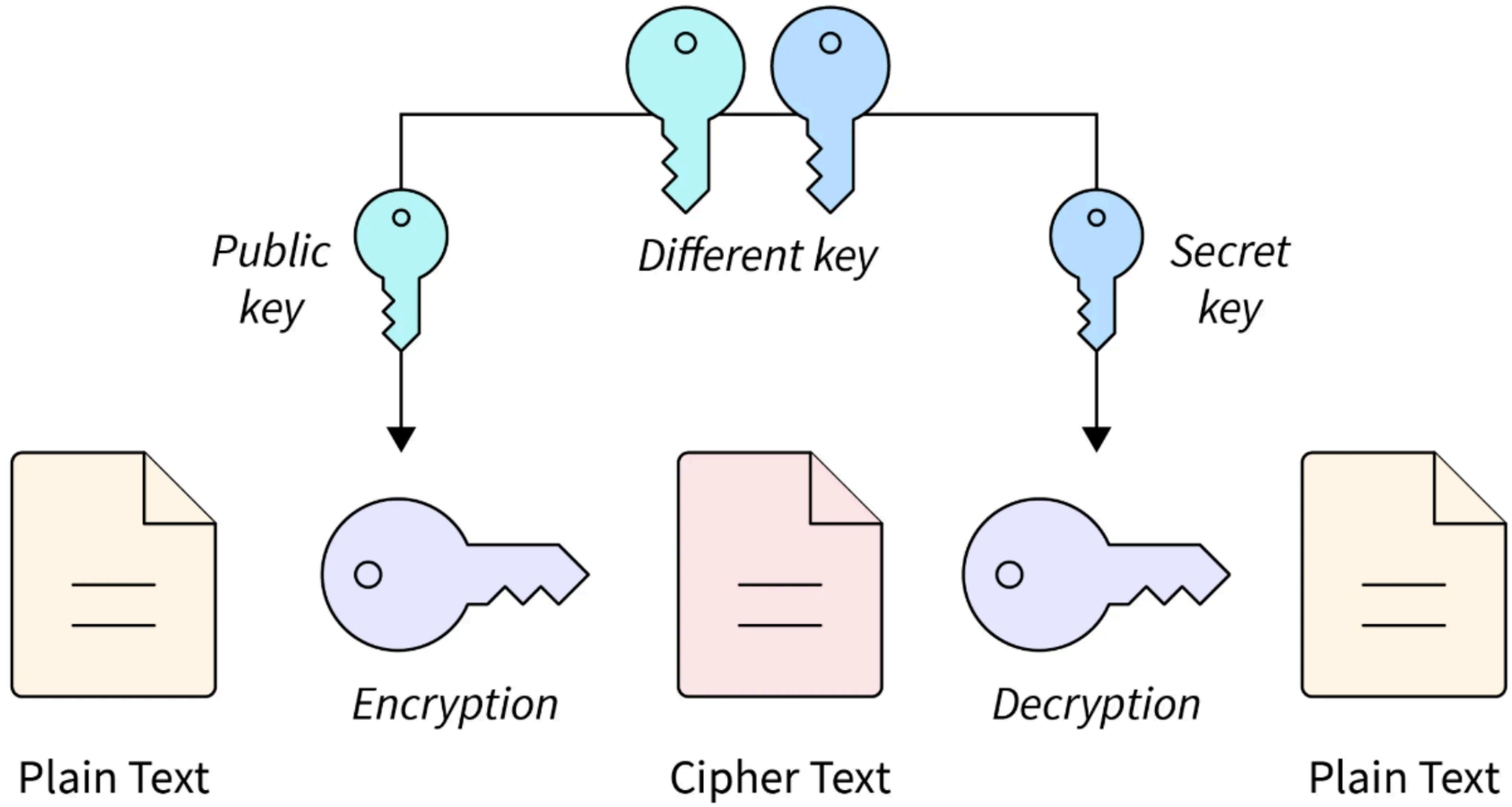


DES | AES | RSA

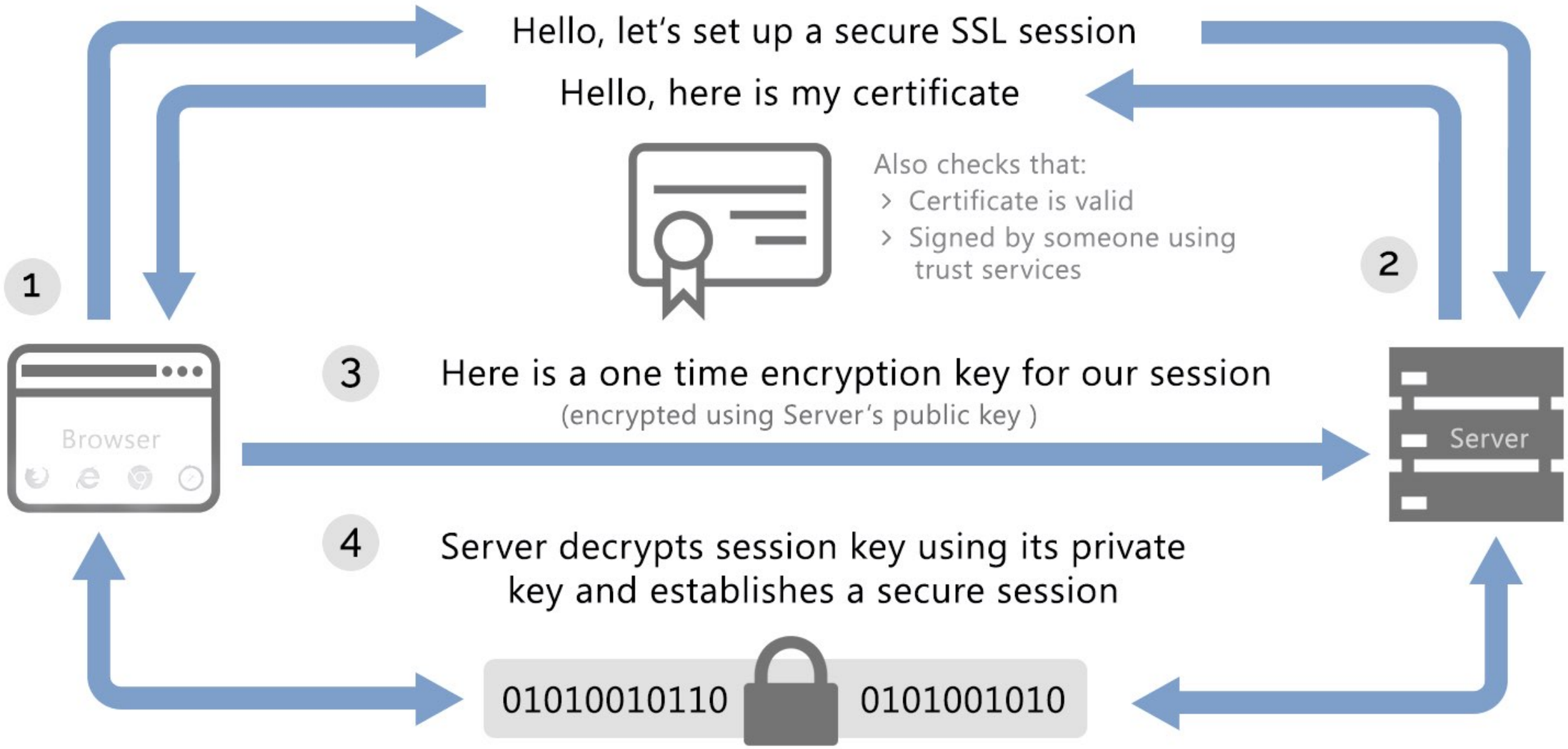
Symmetric key encryption



Asymmetric key encryption

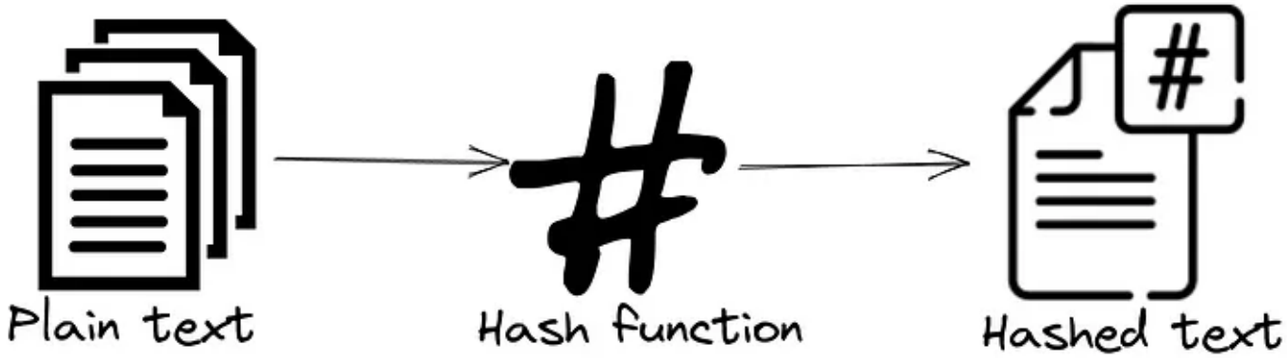


Secure with browser and server



Hashing

One-way summary of data that can’t be reversed
Validate data integrity
Protect data against unwanted changes



md5	SHA256	SHA3

How to prevent ?

Check all sensitive data is encrypted
Avoid storing sensitive data unnecessarily
Use up-to-date and strong standard algorithms
Proper key-secret management
Disable caching for response that contain sensitive data

Don’t store private keys in Git

Workshop with NodeJS

Weak hashing algorithm such as **md5**

```
let hashPassword = async function hashPassword(password) {
  return md5(password)
}

let comparePassword = async function comparePassword(password, hash) {
  return md5(password) === hash
}
```

Please change to Bcrypt

Potential Security Issues

Weak hashing algorithm

Lack of salt

Plain text password

MD5 !!

Security [edit]

One basic requirement of any cryptographic hash function is that it should be computationally infeasible to find two distinct messages that hash to the same value. MD5 fails this requirement catastrophically. On 31 December 2008, the CMU Software Engineering Institute concluded that MD5 was essentially "cryptographically broken and unsuitable for further use".[17] The weaknesses of MD5 have been exploited in the field, most infamously by the Flame malware in 2012. As of 2019, MD5 continues to be widely used, despite its well-documented weaknesses and deprecation by security experts.[18]

A collision attack exists that can find collisions within seconds on a computer with a 2.6 GHz Pentium 4 processor (complexity of $2^{24.1}$).[19] Further, there is also a chosen-prefix collision attack that can produce a collision for two inputs with specified prefixes within seconds, using off-the-shelf computing hardware (complexity 2^{39}).[20] The ability to find collisions has been greatly aided by the use of off-the-shelf GPUs. On an NVIDIA GeForce 8400GS graphics processor, 16–18 million hashes per second can be computed. An NVIDIA GeForce 8800 Ultra can calculate more than 200 million hashes per second.[21]

https://en.wikipedia.org/wiki/MD5#Security

Use Bcrypt

```
import { hash, compare } from 'bcrypt'

const saltRounds = 10

export async function hashPassword(password) {
  return await hash(password, saltRounds)
}

export async function comparePassword(password, hash) {
  return await compare(password, hash)
}
```

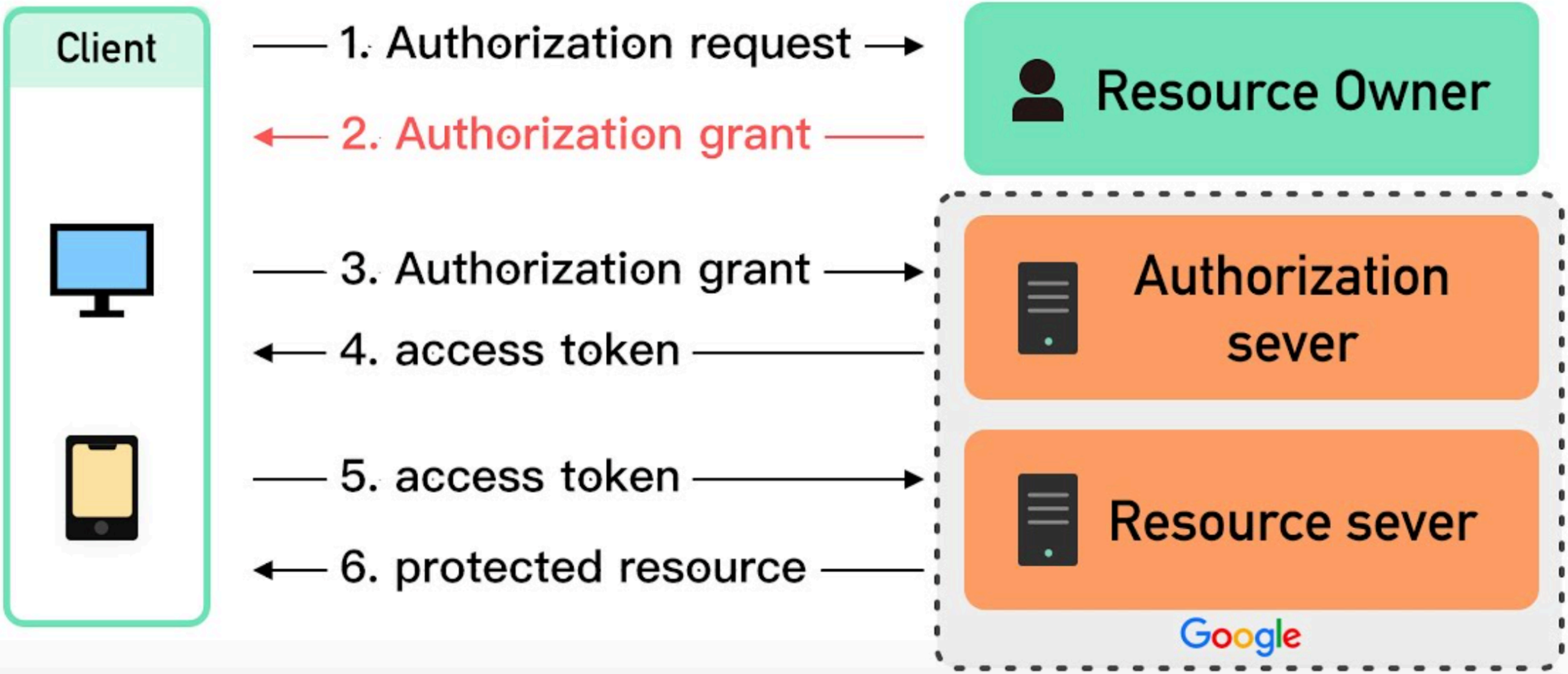
https://github.com/kelektiv/node.bcrypt.js

Testing for Weak Cryptography

Weak transport layer security (TLS)
Padding oracle
Sensitive information sent via unencrypted channel
Weak encryption

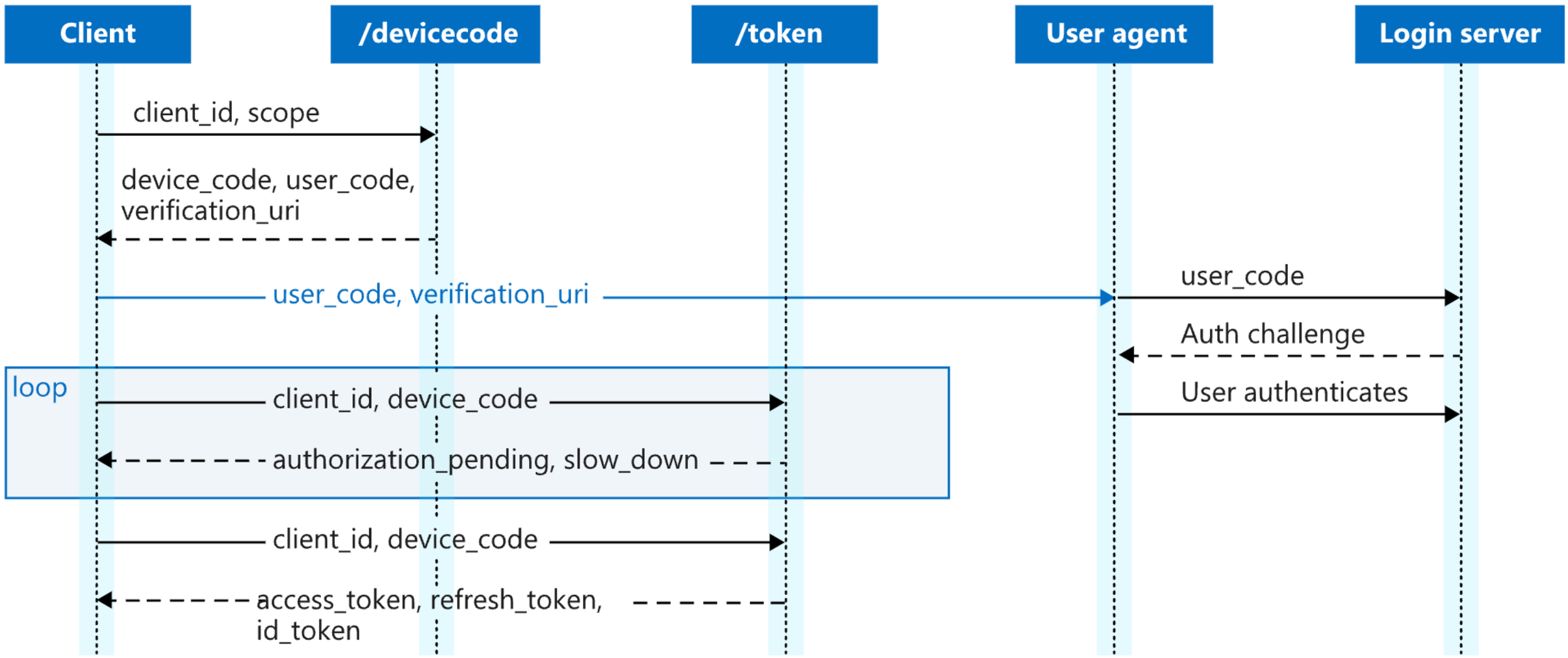
https://owasp.org/www-project-web-security-testing-guide/stable/4-Web_Application_Security_Testing/09-Testing_for_Weak_Cryptography/README

Use OAuth 2



https://oauth.net/2/

Use OAuth 2 from Microsoft



https://github.com/kelektiv/node.bcrypt.js

A03 :: Injection

https://owasp.org/Top10/A03_2021-Injection/

Injection

Cross-Site Scripting (XSS)
SQL injection
External control of filename or path

Types of Injection

SQL

NoSQL

Command

Script

LDAP

XPATH

Root cause of Injection

Lack to validate user's input

Validated	Filters	Sanitized

Input Validate Cheat Sheet

Input Validation Cheat Sheet

Introduction

This article is focused on providing clear, simple, actionable guidance for providing Input Validation security functionality in your applications.

Goals of Input Validation

Input validation is performed to ensure only properly formed data is entering the workflow in an information system, preventing malformed data from persisting in the database and triggering malfunction of various downstream components. Input validation should happen as early as possible in the data flow, preferably as soon as the data is received from the external party.

https://cheatsheetseries.owasp.org/cheatsheets/Input_Validation_Cheat_Sheet.html

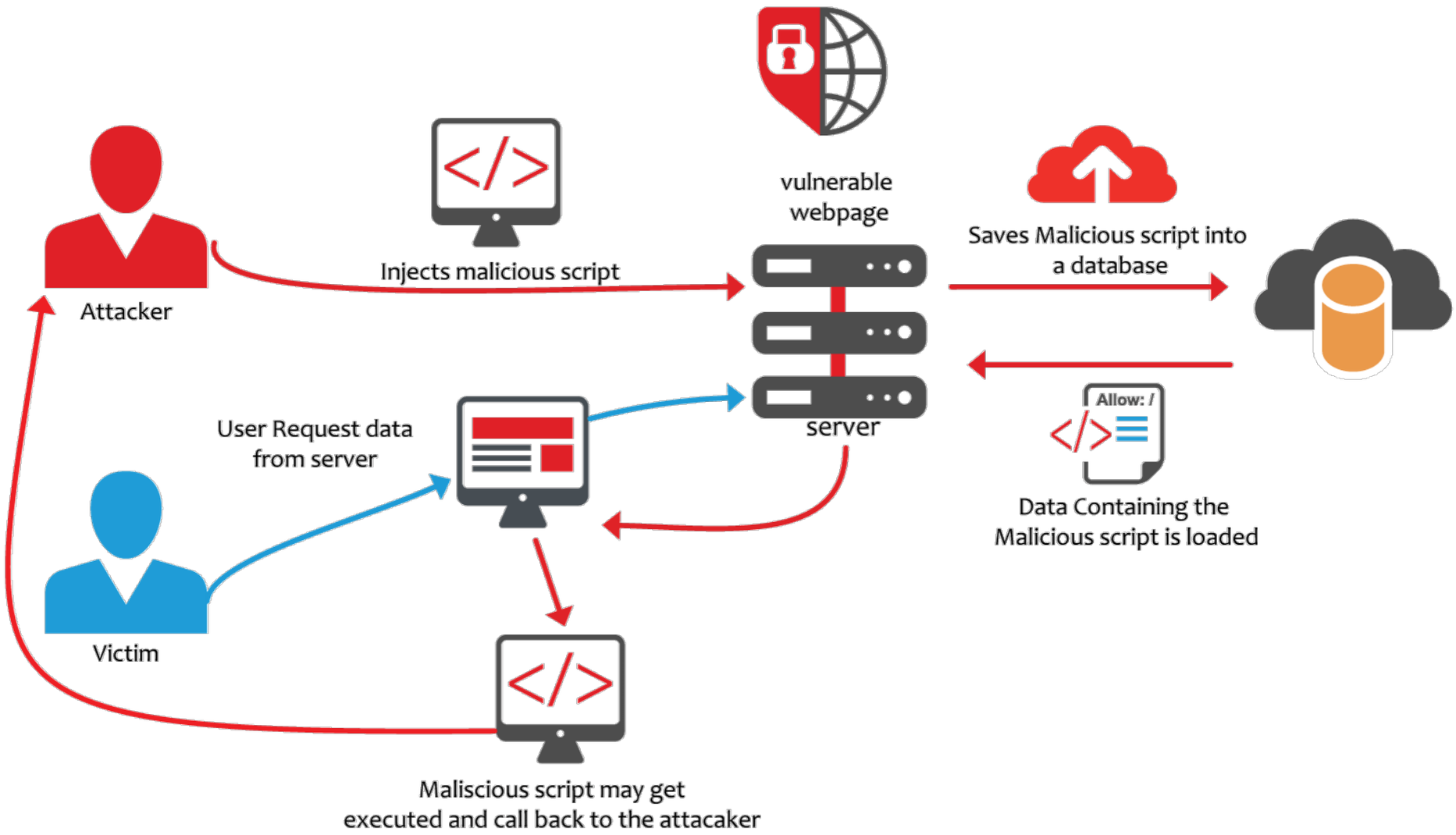
Protect SQL injection

Don’t concat string in SQL statement

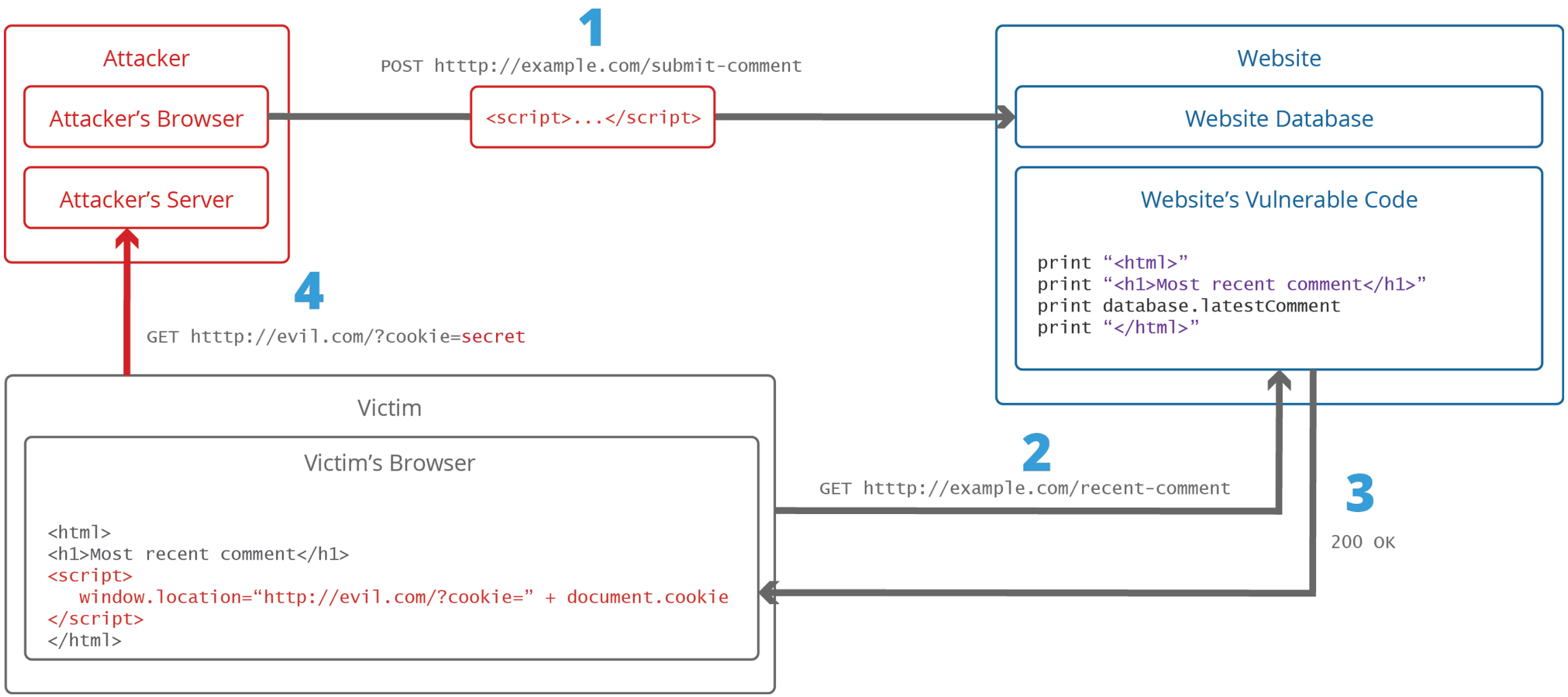
Parameterized query	ORM	Validate and allow lists

Cross-Site Scripting (XSS)

Client-side code injection attack



Cross-Site Scripting (XSS)



https://www.acunetix.com/websitesecurity/cross-site-scripting

A04 :: Insecure Design

https://owasp.org/Top10/A04_2021-Insecure_Design/

Insecure Design

Problem in design, development and delivery process
Lack of secure design patterns
Lack of coding principles

Risk assessment	Threat modeling	Attacker stories

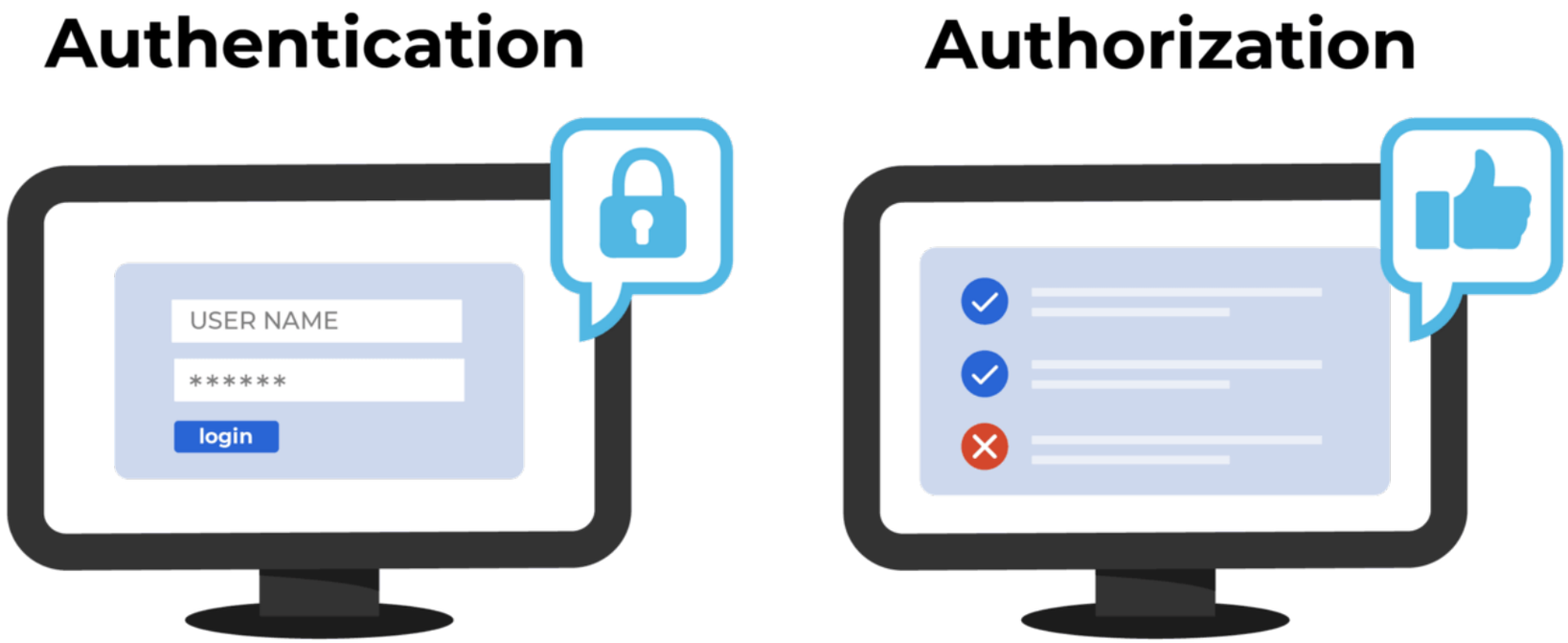
Key aspects Insecure Design

Absence of security control in critical workflow
Lack of security review
Misalign access control
Poor authentication and authorization

Example of Insecure design

Store secret data in client-side
Change user data without strong authorize process
Not protect from bot behavior !!

Web app with insecure authorize

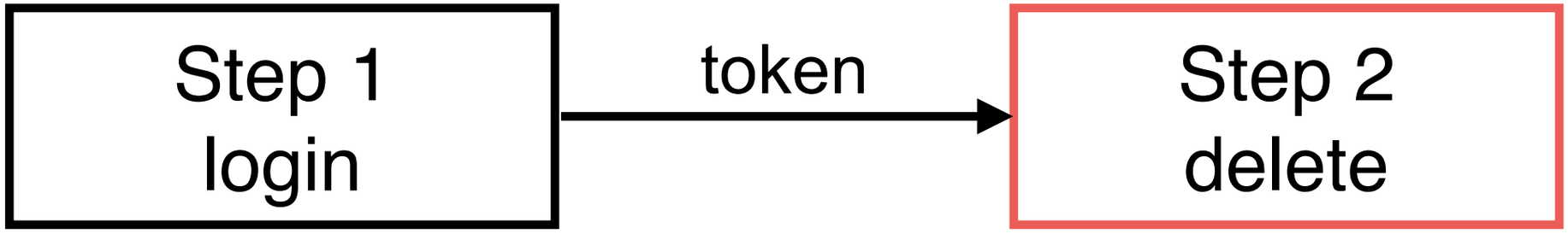


Confirms users
are who they say they are.

Gives users permission
to access a resource.

Web app with insecure authorize

POST /data/delete?id=123
Host: example.com
Authorization: Bearer token

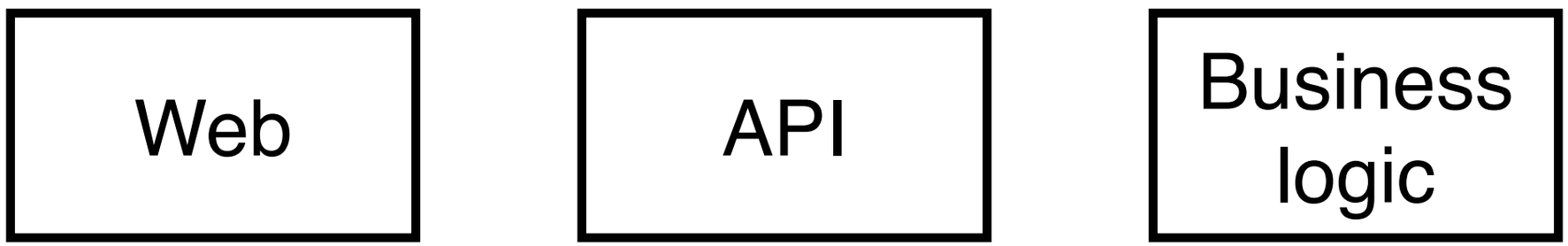


Check token ?

Check permission ?

Security Design Fix

Implement proper authorization checks
Use Role-based access control (RBAC)
Use Attribute-based access control (ABAC)
Apply secure coding principles



Workshop

Secure design and secure development practices of web applications

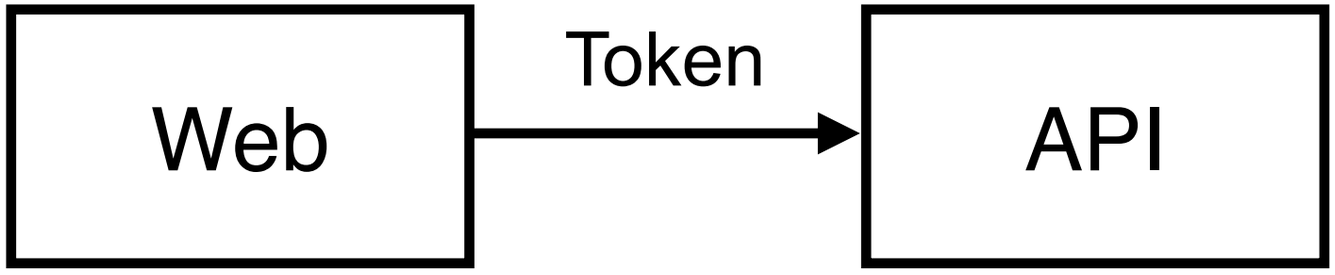
Authentication
Authorization

Web and API ?

Password hashing
JSON Web Token (JWT)
OAuth 2.0

JWT

Json Web Token
Open standard for security transmission information
Use for authentication and authorization in web app



https://jwt.io/

JWT Structure

Encoded PASTE A TOKEN HERE

```
eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.ey
JzdWIiOiIxMjM0NTY3ODkwIiwibmFtZSI6Ikpva
G4gRG9lIiwiaWF0IjoxNTE2MjM5MDIyfQ.SflKx
wRJSMeKKF2QT4fwpMeJf36POk6yJV_adQssw5c
```

Decoded EDIT THE PAYLOAD AND SECRET

HEADER: ALGORITHM & TOKEN TYPE

```
{
  "alg": "HS256",
  "typ": "JWT"
}
```

PAYLOAD: DATA

```
{
  "sub": "1234567890",
  "name": "John Doe",
  "iat": 1516239022
}
```

VERIFY SIGNATURE

```
HMACSHA256(
  base64UrlEncode(header) + "." +
  base64UrlEncode(payload),
  your-256-bit-secret
) ☐ secret base64 encoded
```

https://jwt.io/

JWT {JSON Web Token}

With Love By @Sec_88

1 {"what": "JSON"}

* A file format to store data in Key: value format

```
{
  "Key1" : "Value 1",          // can be string
  "Key2" : ["val1", "val2"],   // or list of string or Json
  "Key 3" : {                  // another Json
      Nested Json,
      [ Json, Json ]           // or list of Json
  }
}
```

Key has to be string

Just a data Structure :)

2 JWT Structure

3 parts

Header

```
{
  "alg" : "HS256"
  "type" : "JWT"
}
```

Base64 encode

data

```
{
  "key" : "foo"
}
```

Base64 encode

Signature

Base64 encode

X • Y • Z

Dots are just used for concatenation

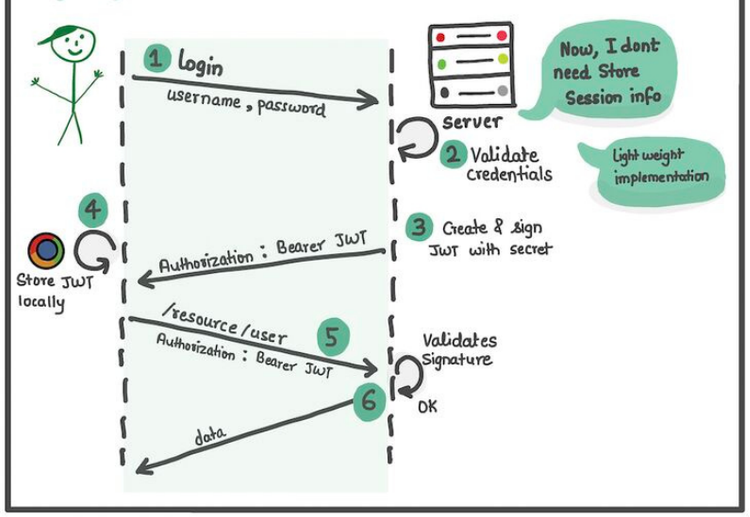
JWT = abc12aq f22401 • c2b2121l0A • 1234abcd+2l

X — I am just Encoded Header

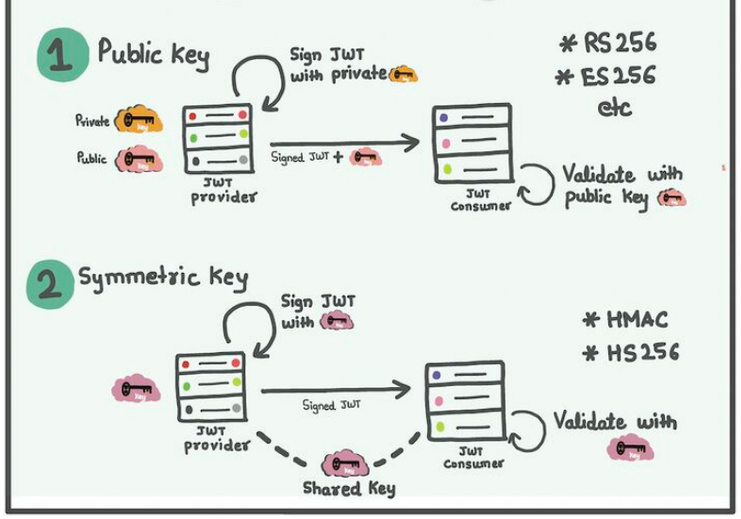
Y — I am just Encoded Data. My keys are also called "CLAIMS". You know there are a few predefined claims

Z — I am Encoded Signature Read down below

3 Working?

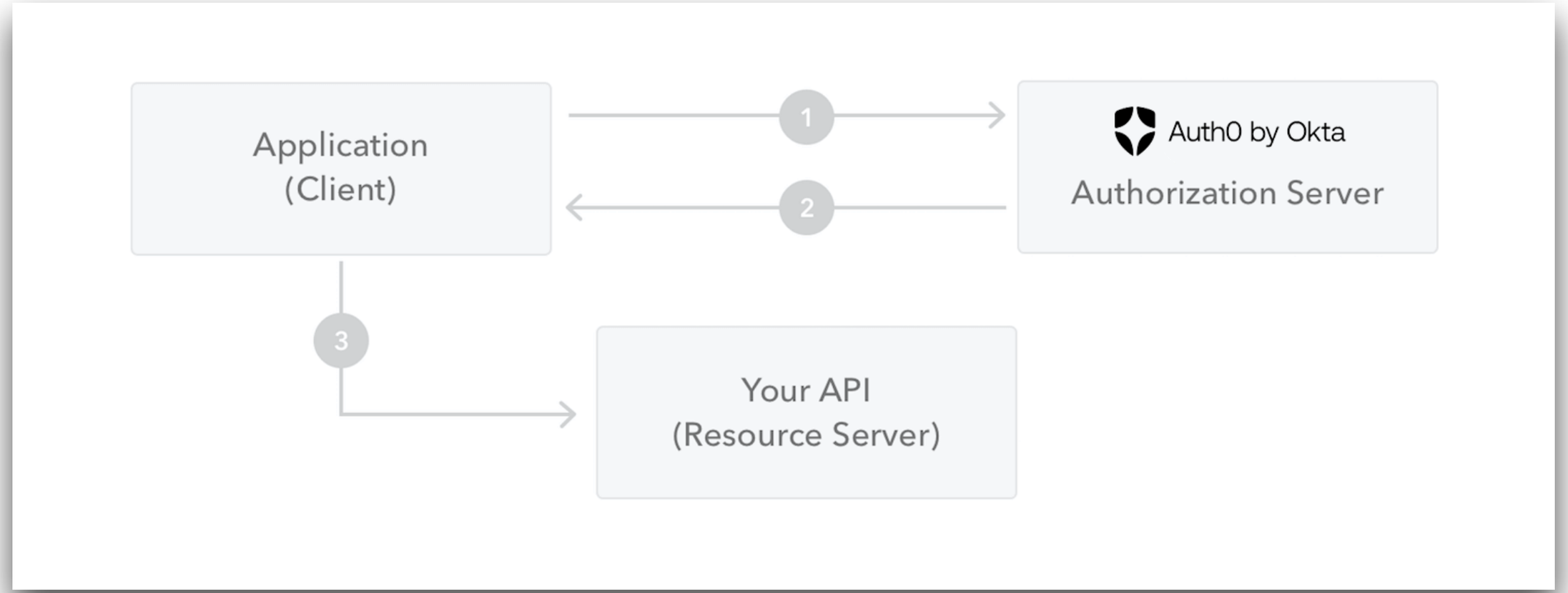


4 Signing Alg



SecurityZines.com In Collaboration with ByteByteGo

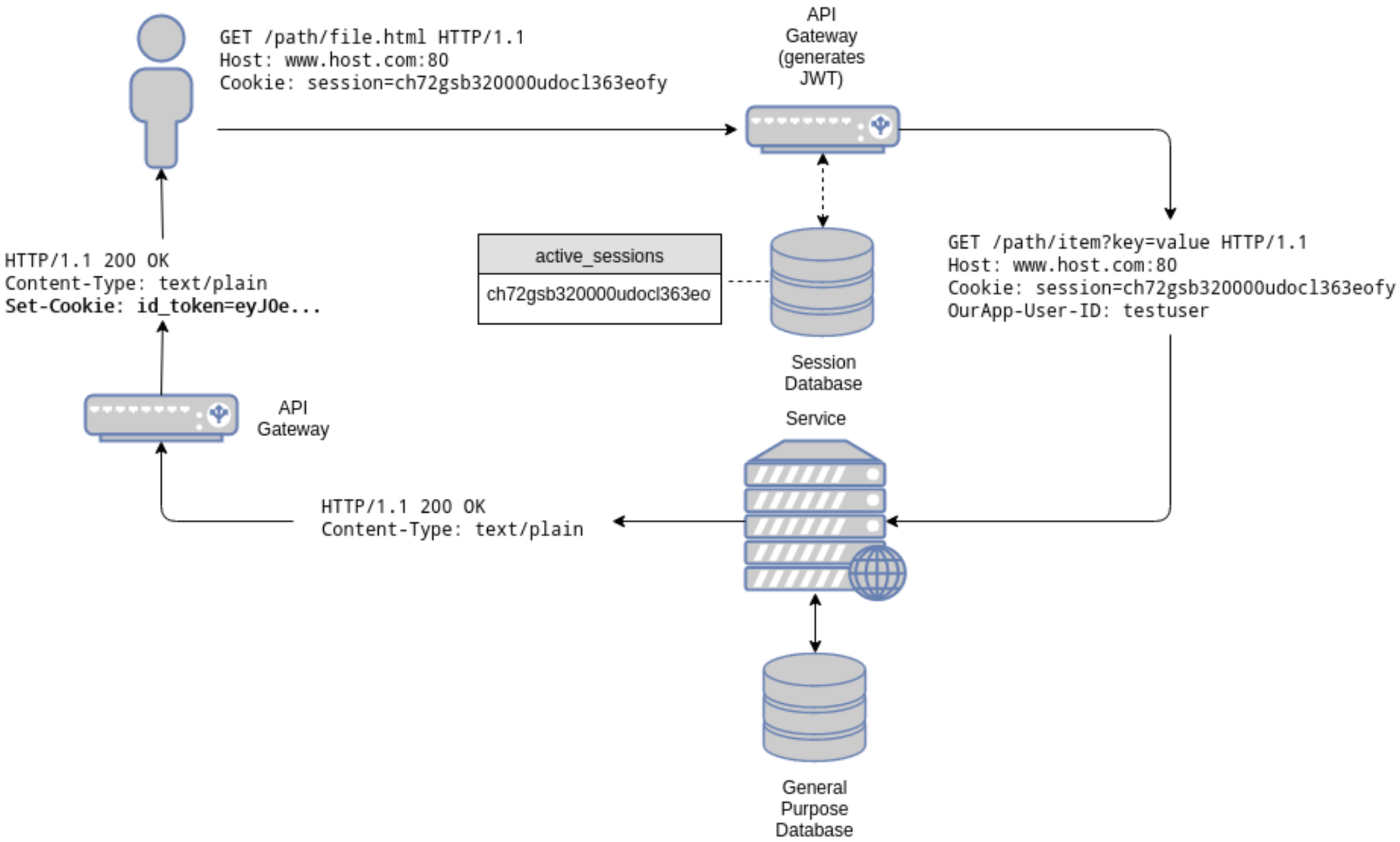
Data flow diagram of JWT



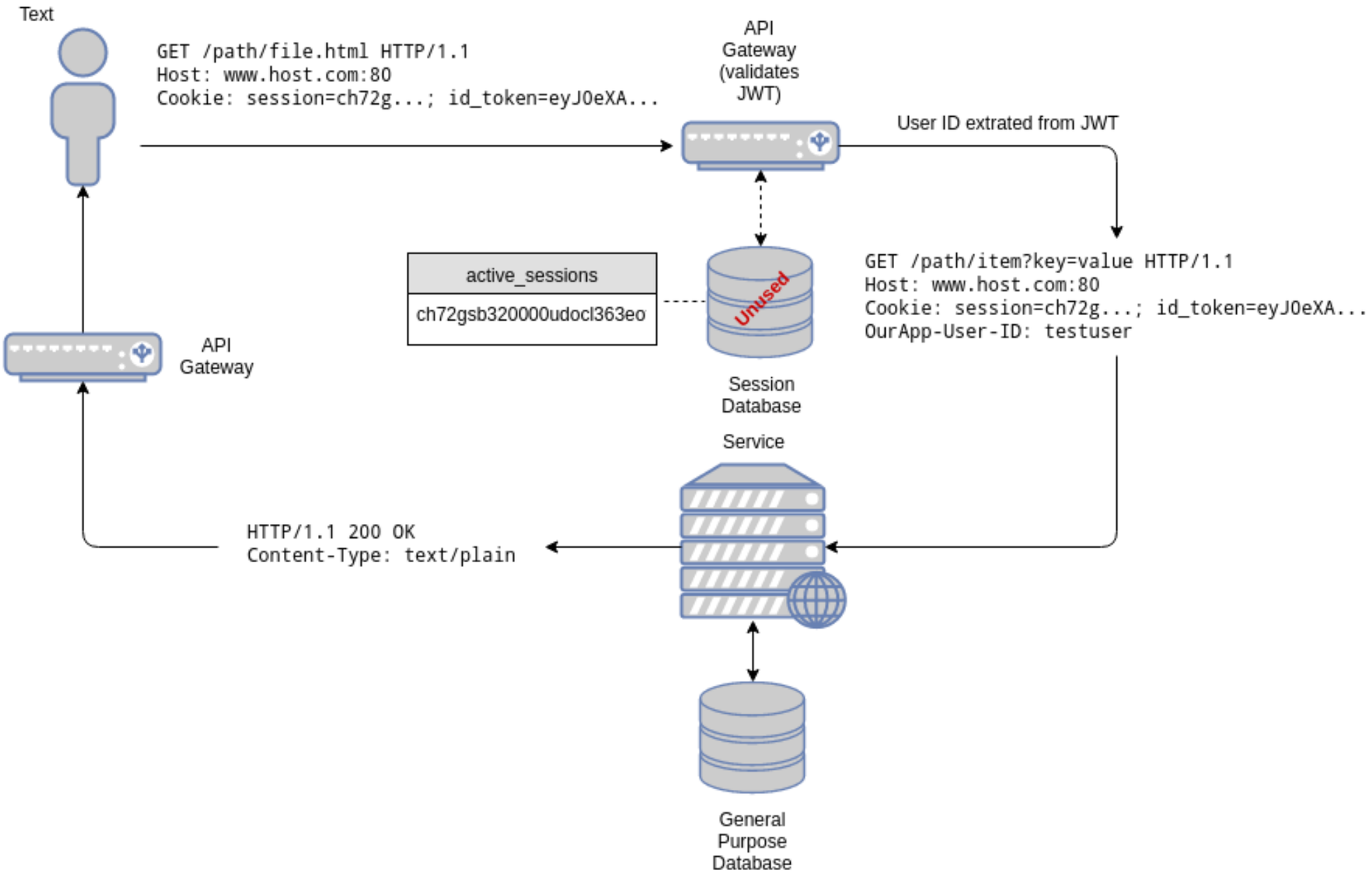
Use cases of JWT token

ID token
Access token
Refresh token

Stateful JWT



Stateless JWT



Advantages of JWT

Cross-domain support
Self-containment and extensibility
Mobile-friendly
Enhanced security

Limitation and consideration of JWT

When payload contains sensitive information
When application has strict size of request
Replay attack
Man-in-the-middle (sign with strong algorithm)

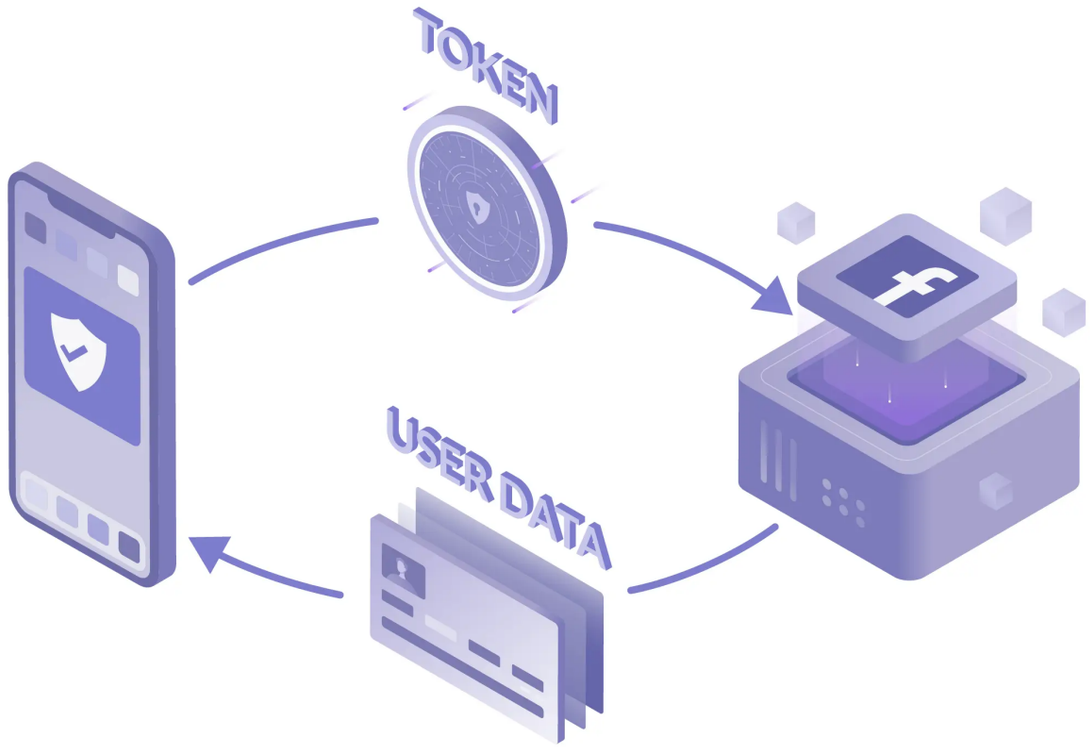
Today data in encode, not encrypt

Best practices for using JWT

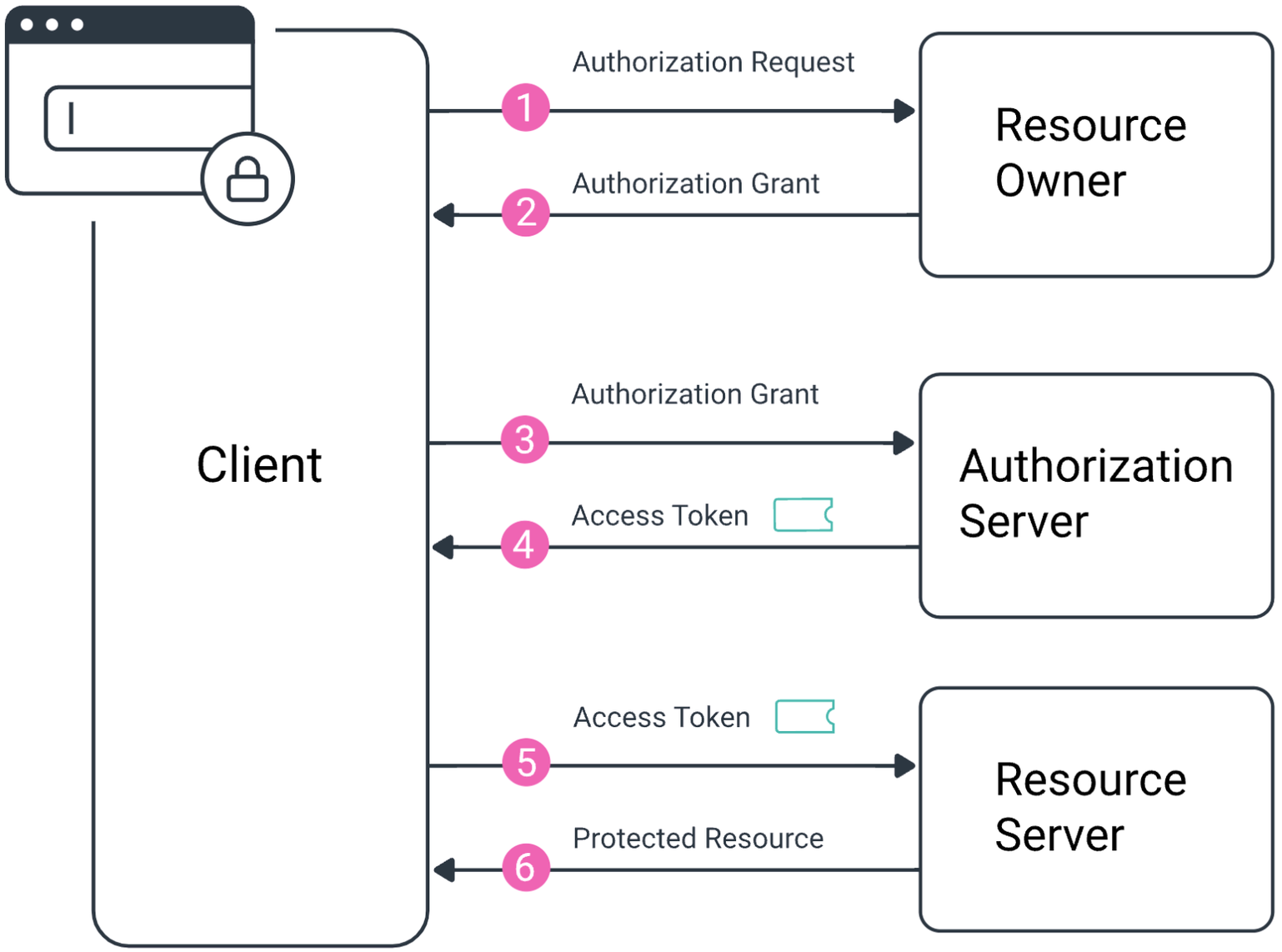
Secure the secret key
Use HTTPs
Use appropriate algorithm (Asymmetric)
Handle token revocation (short expire time)

OAuth 2.0

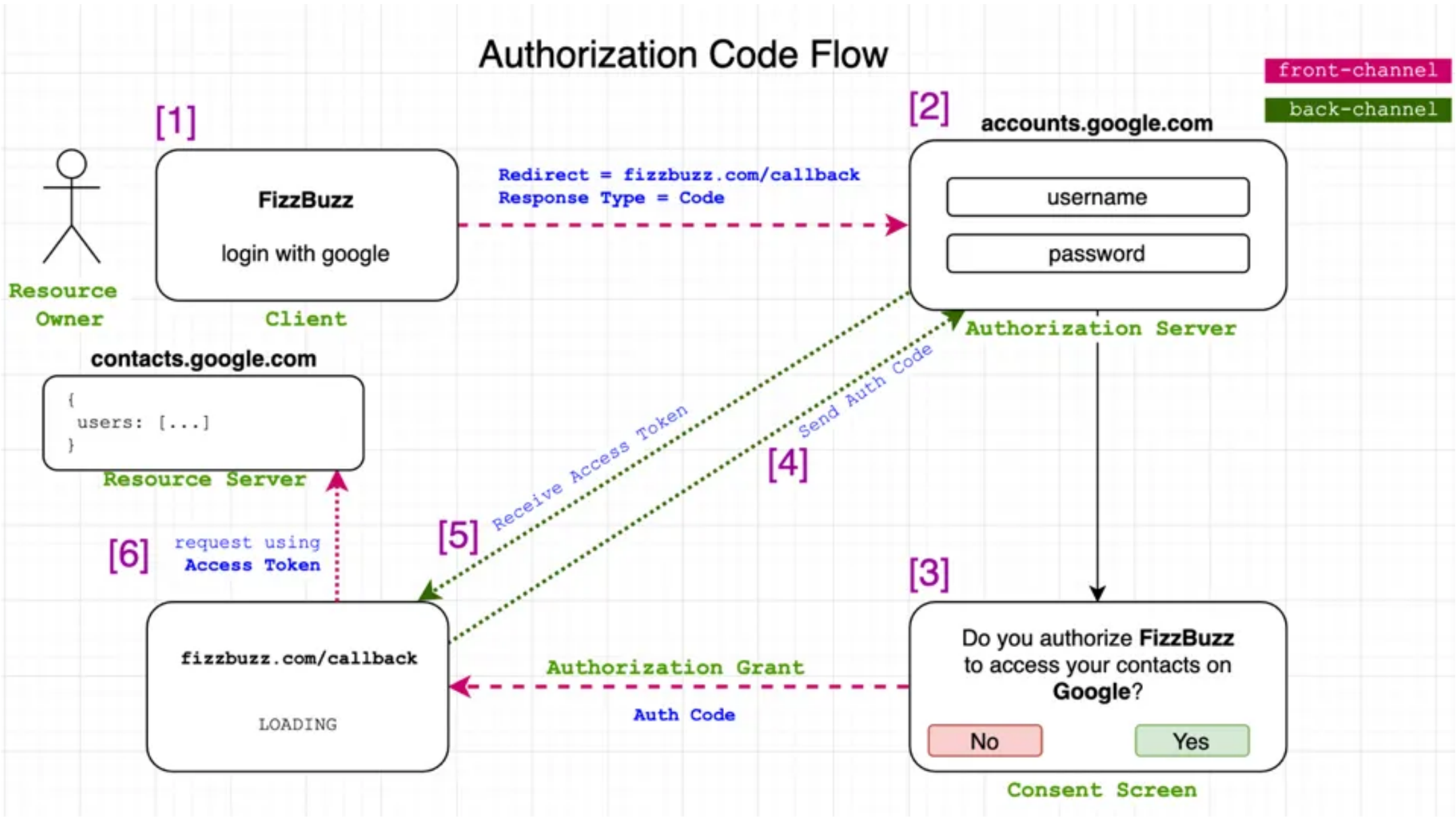
Authorization framework that enables users to safety share data between difference applications



OAuth 2.0 flow



OAuth 2.0 flow



Why OAuth 2.0 ?

Enhance security
User privacy
Simplified integration
User friendly

Best practices for using OAuth 2.0

Use HTTPs
Use PKCE (Proof key for code exchange) for mobile
Choose the right **grant type**
Implement token expiration and revocation
Enhance redirect URI security
Implement proper session management
Utilize token scope

OAuth grant types

Name	Description
Authorization code	Exchange a single-use authorization code for access token
Client credential	Use to obtain access token for client to access resource
Implicit	Return token directly to browser without an intermediate server setup
Resource owner password	Exchange a user's username and password for access token
Device code	Exchange a previously obtained device code for access token
Refresh token	Use for access token when access token has expired

https://oauth.net/2/grant-types/

Workshop

Working with JWT and OAuth 2.0

A05 :: Security Misconfiguration

https://owasp.org/Top10/A05_2021-Security_Misconfiguration/

Security Misconfiguration

Use default configuration
Show error message with real/detail information
Permission for data storage
Open more ports !!
Use outdated software

Balance between secure vs UX

A06 :: Vulnerable and outdated components

Later or Never ?

https://owasp.org/Top10/A06_2021-Vulnerable_and_Outdated_Components/

Vulnerable and outdated components

Development

Framework
Libraries

Operation/Infra

Operating System
Software

Check your dependency

OWASP Dependency-Check

Dependency-Check is a Software Composition Analysis (SCA) tool that attempts to detect publicly disclosed vulnerabilities contained within a project's dependencies. It does this by determining if there is a Common Platform Enumeration (CPE) identifier for a given dependency. If found, it will generate a report linking to the associated CVE entries.

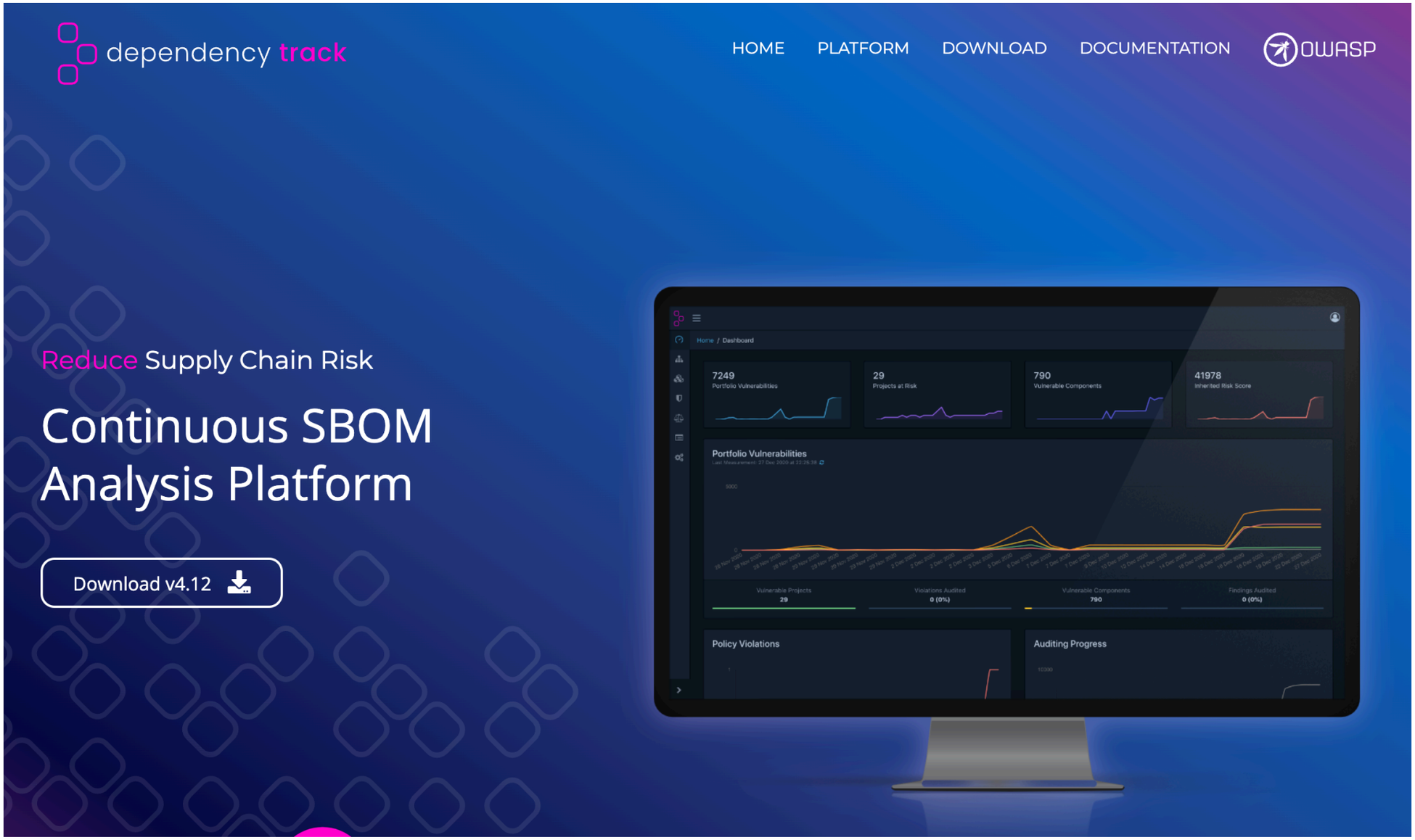
Introduction

The OWASP Top 10 2013 contains a new entry: A9-Using Components with Known Vulnerabilities. Dependency Check can currently be used to scan applications (and their dependent libraries) to identify any known vulnerable components.

The problem with using known vulnerable components was described very well in a paper by Jeff Williams and Arshan Dabirsiaghi titled, "Unfortunate Reality of Insecure Libraries". The gist of the paper is that we as a development community include third party libraries in our applications that contain well known published vulnerabilities (such as those at the National Vulnerability Database).

https://owasp.org/www-project-dependency-check/

Tracking your dependencies



https://dependencytrack.org/

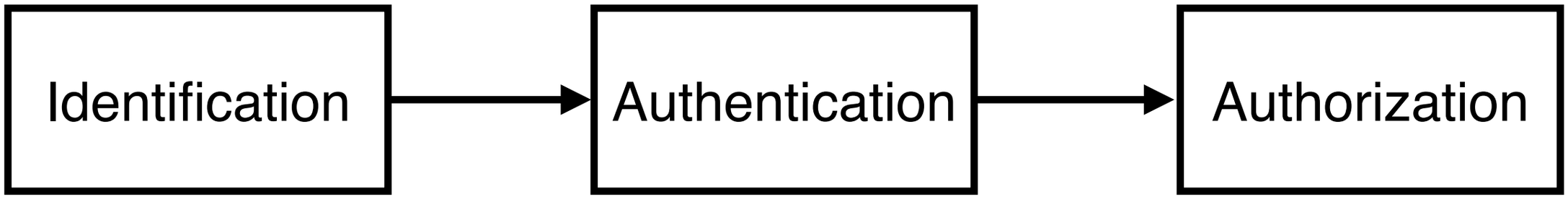
A07 :: Identification and authentication failure

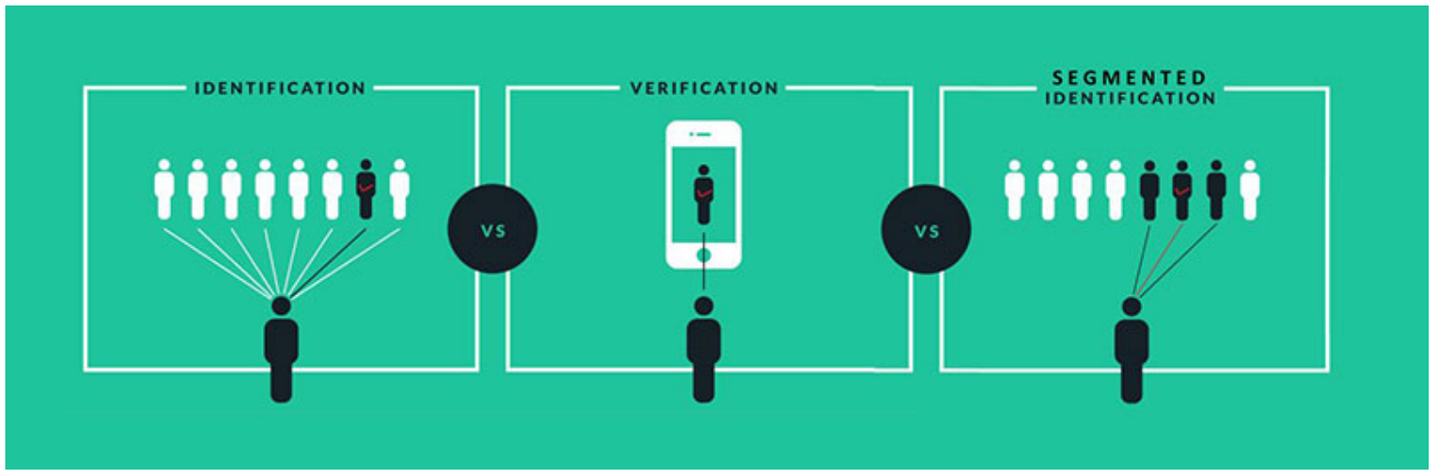
https://owasp.org/Top10/A07_2021-Identification_and_Authentication_Failures/

Identification and authentication failure

Broken authentication
Improper authentication
Allow automated attack, brute force
Weak or ineffective credential recovery
Keep secret in plain text or weak hash algorithm
Expose session or token in URL

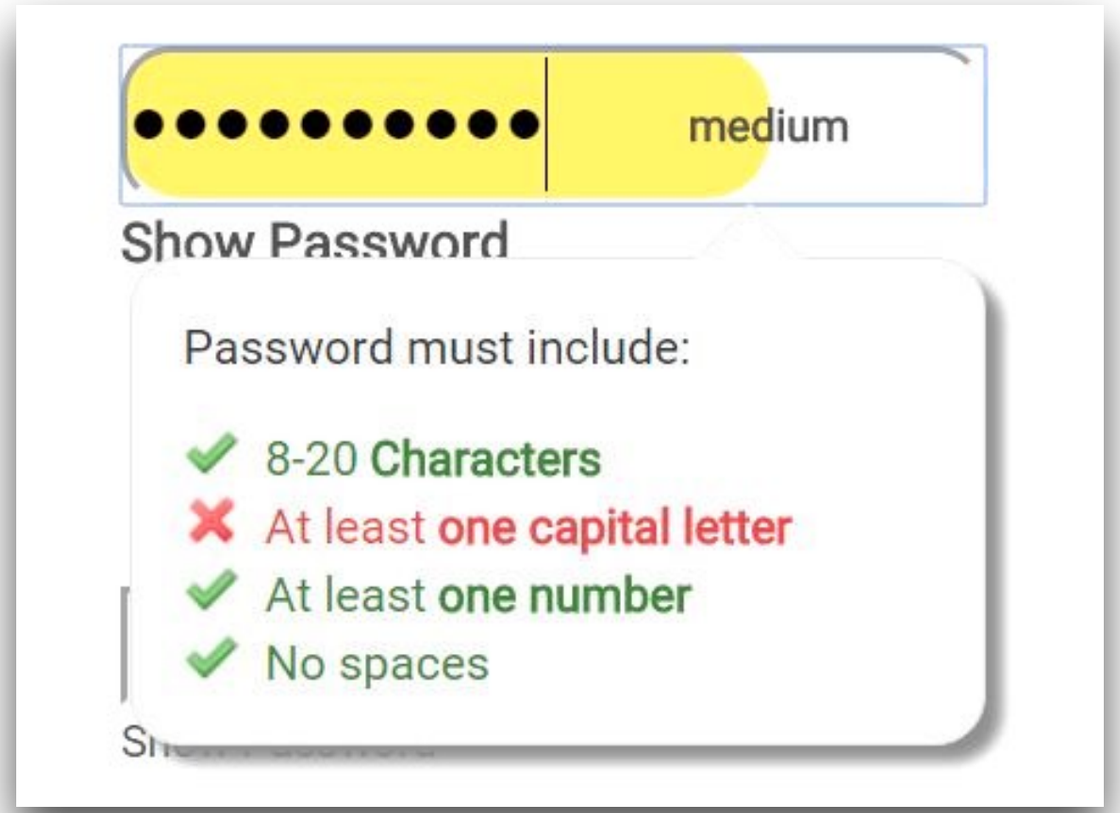
Identification, Authentication





Multi Factors Authentication

Strong password checker



A08 :: Software and Data integrity failures

https://owasp.org/Top10/A08_2021-Software_and_Data_Integrity_Failures/

A09 :: Security logging and Monitoring failures

https://owasp.org/Top10/A09_2021-Security_Logging_and_Monitoring_Failures/

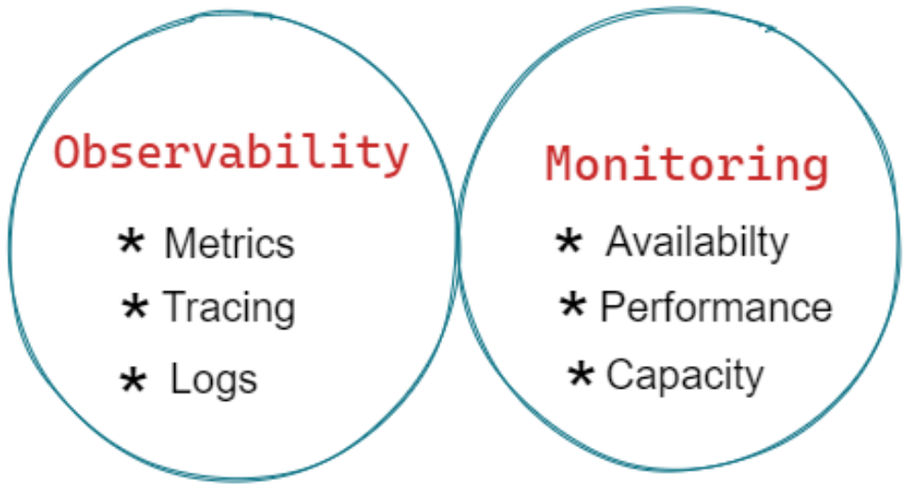
Security logging and Monitoring failures

Insufficient logging
Improper output neutralization for logs
Insert sensitive information into logs
Unclear log message and insufficient
Monitoring can’t monitored suspicious activity

Without logs, we can’t not detect !!

Logging !!

Keep structure log
Design your log first
Keep all events/actions that you want to monitor !!
Auditable events (login fail, high value transaction)
Config rules for alert in near-realtime



https://owasp.org/www-project-developer-guide/draft/implementation/documentation/proactive_controls/

Don’t

```
2011-09-22 22:40:34,036 | ERROR | Thread-2 | o.s.w.s.DispatcherServlet | Context initialization failed
org.springframework.beans.factory.BeanCreationException: Error creating bean with name 'org.springframework.web.servlet.mvc.annotation.DefaultAnnotationHandlerMapping#0': Initialization of bean failed; nested exception is org.springframework.beans.factory.BeanCreationException: Error creating bean with name 'bookControlle
        at org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.doCreateBean(AbstractAutowireCapableBeanFactory.java:527) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.createBean(AbstractAutowireCapableBeanFactory.java:456) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.support.AbstractBeanFactory$1.getObject(AbstractBeanFactory.java:291) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.support.DefaultSingletonBeanRegistry.getSingleton(DefaultSingletonBeanRegistry.java:222) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.support.AbstractBeanFactory.doGetBean(AbstractBeanFactory.java:288) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.support.AbstractBeanFactory.getBean(AbstractBeanFactory.java:190) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.support.DefaultListableBeanFactory.preInstantiateSingletons(DefaultListableBeanFactory.java:580) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.context.support.AbstractApplicationContext.finishBeanFactoryInitialization(AbstractApplicationContext.java:895) ~[spring-context-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.context.support.AbstractApplicationContext.refresh(AbstractApplicationContext.java:425) ~[spring-context-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.web.servlet.FrameworkServlet.createWebApplicationContext(FrameworkServlet.java:442) ~[spring-webmvc-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.web.servlet.FrameworkServlet.createWebApplicationContext(FrameworkServlet.java:458) ~[spring-webmvc-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.web.servlet.FrameworkServlet.initWebApplicationContext(FrameworkServlet.java:339) ~[spring-webmvc-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.web.servlet.FrameworkServlet.initServletBean(FrameworkServlet.java:306) ~[spring-webmvc-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.web.servlet.HttpServletBean.init(HttpServletBean.java:127) [spring-webmvc-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at javax.servlet.GenericServlet.init(GenericServlet.java:160) [servlet-api.jar:3.0.FR]
        at org.apache.catalina.core.StandardWrapper.initServlet(StandardWrapper.java:1201) [catalina.jar:7.0.16]
        at org.apache.catalina.core.StandardWrapper.loadServlet(StandardWrapper.java:1114) [catalina.jar:7.0.16]
        at org.apache.catalina.core.StandardWrapper.load(StandardWrapper.java:1021) [catalina.jar:7.0.16]
        at org.apache.catalina.core.StandardContext.loadOnStartup(StandardContext.java:4957) [catalina.jar:7.0.16]
        at org.apache.catalina.core.StandardContext$3.call(StandardContext.java:5284) [catalina.jar:7.0.16]
        at org.apache.catalina.core.StandardContext$3.call(StandardContext.java:5279) [catalina.jar:7.0.16]
        at java.util.concurrent.FutureTask$Sync.innerRun(FutureTask.java:303) [na:1.6.0_26]
        at java.util.concurrent.FutureTask.run(FutureTask.java:138) [na:1.6.0_26]
        at java.util.concurrent.ThreadPoolExecutor$Worker.runTask(ThreadPoolExecutor.java:886) [na:1.6.0_26]
        at java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:908) [na:1.6.0_26]
        at java.lang.Thread.run(Thread.java:662) [na:1.6.0_26]
Caused by: org.springframework.beans.factory.BeanCreationException: Error creating bean with name 'bookController': Injection of resource dependencies failed; nested exception is org.springframework.beans.factory.BeanCreationException: Error creating bean with name 'bookService': Injection of resource dependencies failed
        at org.springframework.context.annotation.CommonAnnotationBeanPostProcessor.postProcessPropertyValues(CommonAnnotationBeanPostProcessor.java:300) ~[spring-context-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.populateBean(AbstractAutowireCapableBeanFactory.java:1074) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.doCreateBean(AbstractAutowireCapableBeanFactory.java:517) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.createBean(AbstractAutowireCapableBeanFactory.java:456) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.support.AbstractBeanFactory$1.getObject(AbstractBeanFactory.java:291) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.support.DefaultSingletonBeanRegistry.getSingleton(DefaultSingletonBeanRegistry.java:222) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.support.AbstractBeanFactory.doGetBean(AbstractBeanFactory.java:288) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.support.AbstractBeanFactory.getBean(AbstractBeanFactory.java:190) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.context.support.AbstractApplicationContext.getBean(AbstractApplicationContext.java:1075) ~[spring-context-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.web.servlet.handler.AbstractUrlHandlerMapping.registerHandler(AbstractUrlHandlerMapping.java:383) ~[spring-webmvc-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.web.servlet.handler.AbstractUrlHandlerMapping.registerHandler(AbstractUrlHandlerMapping.java:362) ~[spring-webmvc-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.web.servlet.handler.AbstractDetectingUrlHandlerMapping.detectHandlers(AbstractDetectingUrlHandlerMapping.java:82) ~[spring-webmvc-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.web.servlet.handler.AbstractDetectingUrlHandlerMapping.initApplicationContext(AbstractDetectingUrlHandlerMapping.java:58) ~[spring-webmvc-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.context.support.ApplicationObjectSupport.initApplicationContext(ApplicationObjectSupport.java:119) ~[spring-context-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.web.context.support.WebApplicationObjectSupport.initApplicationContext(WebApplicationObjectSupport.java:72) ~[spring-web-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.context.support.ApplicationObjectSupport.setApplicationContext(ApplicationObjectSupport.java:73) ~[spring-context-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.context.support.ApplicationContextAwareProcessor.invokeAwareInterfaces(ApplicationContextAwareProcessor.java:106) ~[spring-context-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.context.support.ApplicationContextAwareProcessor.postProcessBeforeInitialization(ApplicationContextAwareProcessor.java:85) ~[spring-context-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.applyBeanPostProcessorsBeforeInitialization(AbstractAutowireCapableBeanFactory.java:394) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.initializeBean(AbstractAutowireCapableBeanFactory.java:1413) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.doCreateBean(AbstractAutowireCapableBeanFactory.java:519) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        ... 25 common frames omitted
Caused by: org.springframework.beans.factory.BeanCreationException: Error creating bean with name 'bookService': Injection of resource dependencies failed; nested exception is org.springframework.beans.factory.BeanCreationException: Error creating bean with name 'bookDao': Injection of resource dependencies failed; neste
        at org.springframework.context.annotation.CommonAnnotationBeanPostProcessor.postProcessPropertyValues(CommonAnnotationBeanPostProcessor.java:300) ~[spring-context-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.populateBean(AbstractAutowireCapableBeanFactory.java:1074) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.doCreateBean(AbstractAutowireCapableBeanFactory.java:517) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.createBean(AbstractAutowireCapableBeanFactory.java:456) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.support.AbstractBeanFactory$1.getObject(AbstractBeanFactory.java:291) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.support.DefaultSingletonBeanRegistry.getSingleton(DefaultSingletonBeanRegistry.java:222) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.support.AbstractBeanFactory.doGetBean(AbstractBeanFactory.java:288) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.support.AbstractBeanFactory.getBean(AbstractBeanFactory.java:194) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.context.annotation.CommonAnnotationBeanPostProcessor.autowireResource(CommonAnnotationBeanPostProcessor.java:435) ~[spring-context-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.context.annotation.CommonAnnotationBeanPostProcessor.getResource(CommonAnnotationBeanPostProcessor.java:409) ~[spring-context-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.context.annotation.CommonAnnotationBeanPostProcessor$ResourceElement.getResourceToInject(CommonAnnotationBeanPostProcessor.java:541) ~[spring-context-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.annotation.InjectionMetadata$InjectedElement.inject(InjectionMetadata.java:147) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.annotation.InjectionMetadata.inject(InjectionMetadata.java:84) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.context.annotation.CommonAnnotationBeanPostProcessor.postProcessPropertyValues(CommonAnnotationBeanPostProcessor.java:297) ~[spring-context-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        ... 45 common frames omitted
Caused by: org.springframework.beans.factory.BeanCreationException: Error creating bean with name 'bookDao': Injection of resource dependencies failed; nested exception is org.springframework.beans.factory.NoSuchBeanDefinitionException: No matching bean of type [javax.sql.DataSource] found for dependency: expected at le
        at org.springframework.context.annotation.CommonAnnotationBeanPostProcessor.postProcessPropertyValues(CommonAnnotationBeanPostProcessor.java:300) ~[spring-context-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.populateBean(AbstractAutowireCapableBeanFactory.java:1074) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.doCreateBean(AbstractAutowireCapableBeanFactory.java:517) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.support.AbstractAutowireCapableBeanFactory.createBean(AbstractAutowireCapableBeanFactory.java:456) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.support.AbstractBeanFactory$1.getObject(AbstractBeanFactory.java:291) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.support.DefaultSingletonBeanRegistry.getSingleton(DefaultSingletonBeanRegistry.java:222) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.support.AbstractBeanFactory.doGetBean(AbstractBeanFactory.java:288) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.support.AbstractBeanFactory.getBean(AbstractBeanFactory.java:194) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.context.annotation.CommonAnnotationBeanPostProcessor.autowireResource(CommonAnnotationBeanPostProcessor.java:435) ~[spring-context-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.context.annotation.CommonAnnotationBeanPostProcessor.getResource(CommonAnnotationBeanPostProcessor.java:409) ~[spring-context-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.context.annotation.CommonAnnotationBeanPostProcessor$ResourceElement.getResourceToInject(CommonAnnotationBeanPostProcessor.java:541) ~[spring-context-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.annotation.InjectionMetadata$InjectedElement.inject(InjectionMetadata.java:147) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.annotation.InjectionMetadata.inject(InjectionMetadata.java:84) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.context.annotation.CommonAnnotationBeanPostProcessor.postProcessPropertyValues(CommonAnnotationBeanPostProcessor.java:297) ~[spring-context-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        ... 58 common frames omitted
Caused by: org.springframework.beans.factory.NoSuchBeanDefinitionException: No matching bean of type [javax.sql.DataSource] found for dependency: expected at least 1 bean which qualifies as autowire candidate for this dependency. Dependency annotations: {@javax.annotation.Resource(shareable=true, mappedName=, descriptio
        at org.springframework.beans.factory.support.DefaultListableBeanFactory.raiseNoSuchBeanDefinitionException(DefaultListableBeanFactory.java:920) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.support.DefaultListableBeanFactory.doResolveDependency(DefaultListableBeanFactory.java:789) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.support.DefaultListableBeanFactory.resolveDependency(DefaultListableBeanFactory.java:703) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.context.annotation.CommonAnnotationBeanPostProcessor.autowireResource(CommonAnnotationBeanPostProcessor.java:431) ~[spring-context-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.context.annotation.CommonAnnotationBeanPostProcessor.getResource(CommonAnnotationBeanPostProcessor.java:409) ~[spring-context-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.context.annotation.CommonAnnotationBeanPostProcessor$ResourceElement.getResourceToInject(CommonAnnotationBeanPostProcessor.java:541) ~[spring-context-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.annotation.InjectionMetadata$InjectedElement.inject(InjectionMetadata.java:147) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.beans.factory.annotation.InjectionMetadata.inject(InjectionMetadata.java:84) ~[spring-beans-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        at org.springframework.context.annotation.CommonAnnotationBeanPostProcessor.postProcessPropertyValues(CommonAnnotationBeanPostProcessor.java:297) ~[spring-context-3.0.5.RELEASE.jar:3.0.5.RELEASE]
        ... 71 common frames omitted
```

Don’t

```
Exception in thread "main" java.lang.IllegalStateException: A book has a null property
        at com.example.myproject.Author.getBookIds(Author.java:38)
        at com.example.myproject.Bootstrap.main(Bootstrap.java:14)
Caused by: java.weblayer.ZzzException
        at com.example.weblayer.Book.getId(WebBook.java:12)
        at com.example.weblayer.Author.getBookIds(WebAuthor.java:38)
Caused by: java.servicelayer.YyyException
        at com.example.servicelayer.Book.getId(BookService.java:220)
        at com.example.servicelayer.Author.getBookIds(AuthorService.java:350)
Caused by: java.componentlayer.NullPointerException
        at com.example.componentlayer.Book.getId(Book.java:22)
        at com.example.componentlayer.Author.getBookIds(Author.java:35)
Caused by: java.lang.daolayer.XxxException
        at com.example.daolayer.Book.getId(BookDao.java:22)
        at com.example.daolayer.Author.getBookIds(AuthorDao.java:35)
        ... 1 more
```

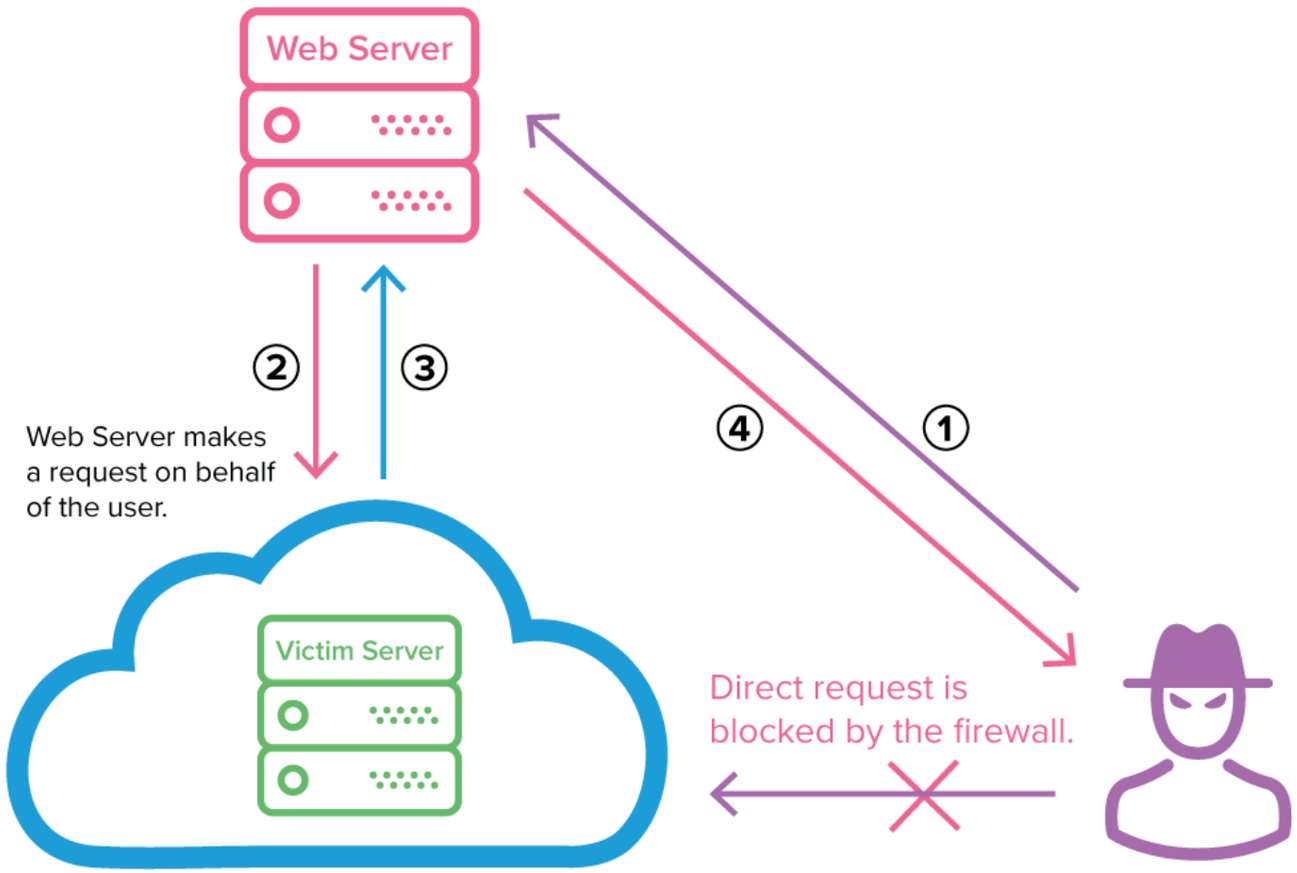
Root Cause may in the middle

A10 :: Server side request forgery (SSRF)

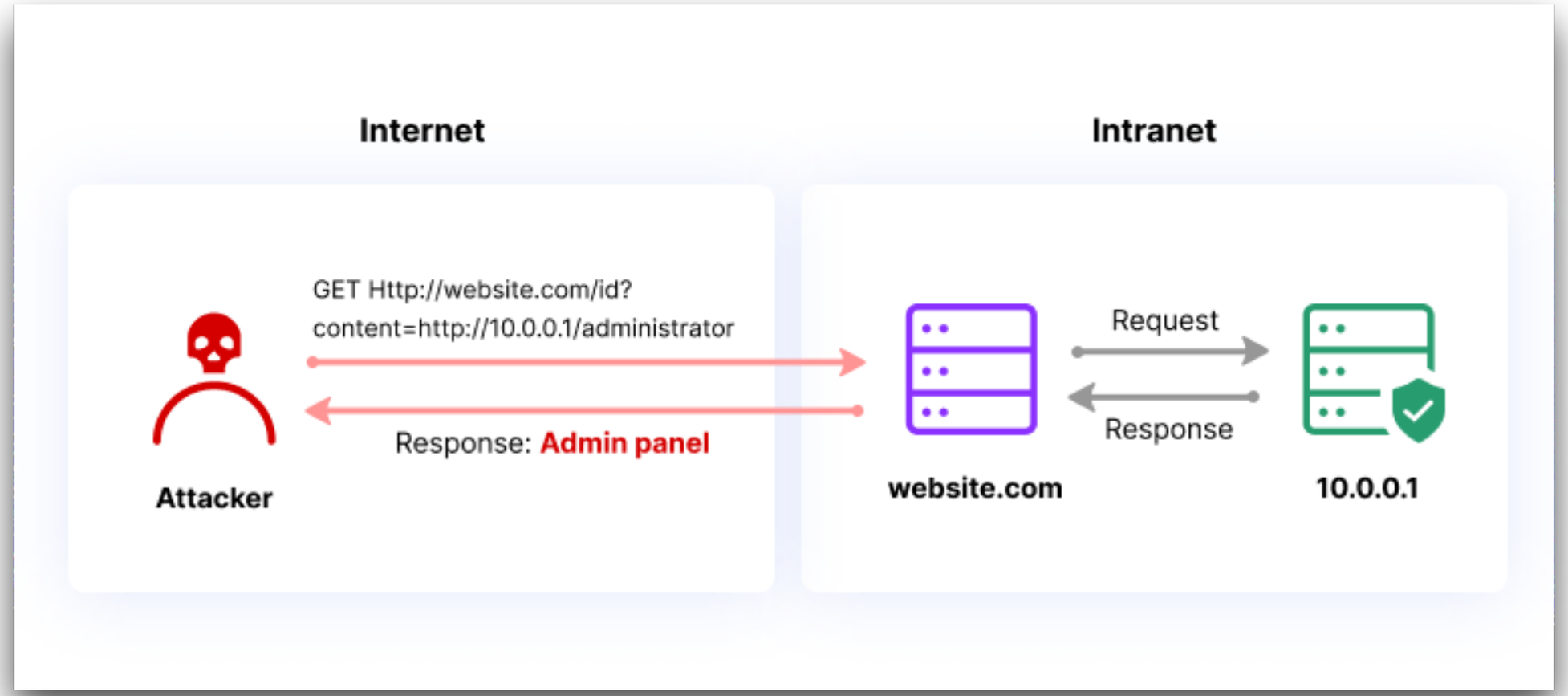
https://owasp.org/Top10/A10_2021-Server-Side_Request_Forgery_%28SSRF%29/

Server side request forgery

Allow an attacker to cause the server-side app to make requests other than an unintended location



Example



Why SSRF is dangerous ?

Trust relationship between internal systems
Allow attackers to scan local or external networks
Expose files and internal resources in server

How to prevent ?

Application layer

Sanitize and validate all client inputs
Allow URL in whitelist
Don’t send raw response to client
Disable HTTP redirection

Network layer

Segment remote resource access
Deny by default
Logging

https://cheatsheetseries.owasp.org/cheatsheets/Server_Side_Request_Forgery_Prevention_Cheat_Sheet.html

OWASP

TOP 10

Pro Active Controls 2024

https://top10proactive.owasp.org/

OWASP Application Security Verification Standard

https://owasp.org/www-project-application-security-verification-standard/

2. Planing and Design

2. Planning and Design

Understand requirements, project timeline
Technology selection
Human resources
Required software and hardware

Security Architect	Security Officer	Security Tester

Security Testing

What to test ?

When to test ?

What tools are required ?

Secure by Design ?

Check all possible security design implementation
Security risk assessment
Review all design document
Threat modeling

Key Concepts

Threat modeling	Secure coding practices
Least privilege	Defense in Depth

Threat Modeling

Process to analyze and modeling threat
Find solution and tools to protect/prevent

How attackers can abuse app ?	How to fix vulnerabilities ?	How important to fix issues ?

https://owasp.org/www-community/Threat_Modeling

Threat modeling with STRIDE

Name	Description	Process
Spoofing	การปลอมแปลงตัวตน	Authentication
Tampering	การแก้ไขข้อมูล	Integrity
Repudiation	การปฏิเสธความรับผิดชอบ	Non-repudiation
Information Disclosure	การเปิดเผยข้อมูลโดยไม่ได้รับอนุญาต	Confidentiality
Denial of Service	การปฏิเสธการให้บริการ	Availability
Elevation of Privilege	การยกระดับสิทธิ์	Authorization

https://learn.microsoft.com/en-us/azure/security/develop/threat-modeling-tool-getting-started

Spoofing

Attacker pretends to be someone or something else
Are both sides of the communication authenticated ?

Email	Website
IP	DNS

Tampering

Attacker changes data without authorization

How do I know someone can't change data in transit, in use, or at rest?

Repudiation

Attacker claims to not have done something
Can every action be tied to an **identity**?

Authentication

Logging

Digital signature

Information Disclosure

Attacker sees data they aren't supposed to see

How do I know someone can't see data in transit, in use, or at rest?

Authorization RBAC	Log monitoring
Data encryption	Training

Denial of Service

Attacker brings your system down (DDOS)

Are there areas in the system where resource is limited?

Volume Attack

Protocol attack

Application layer attack

Elevation of Privilege

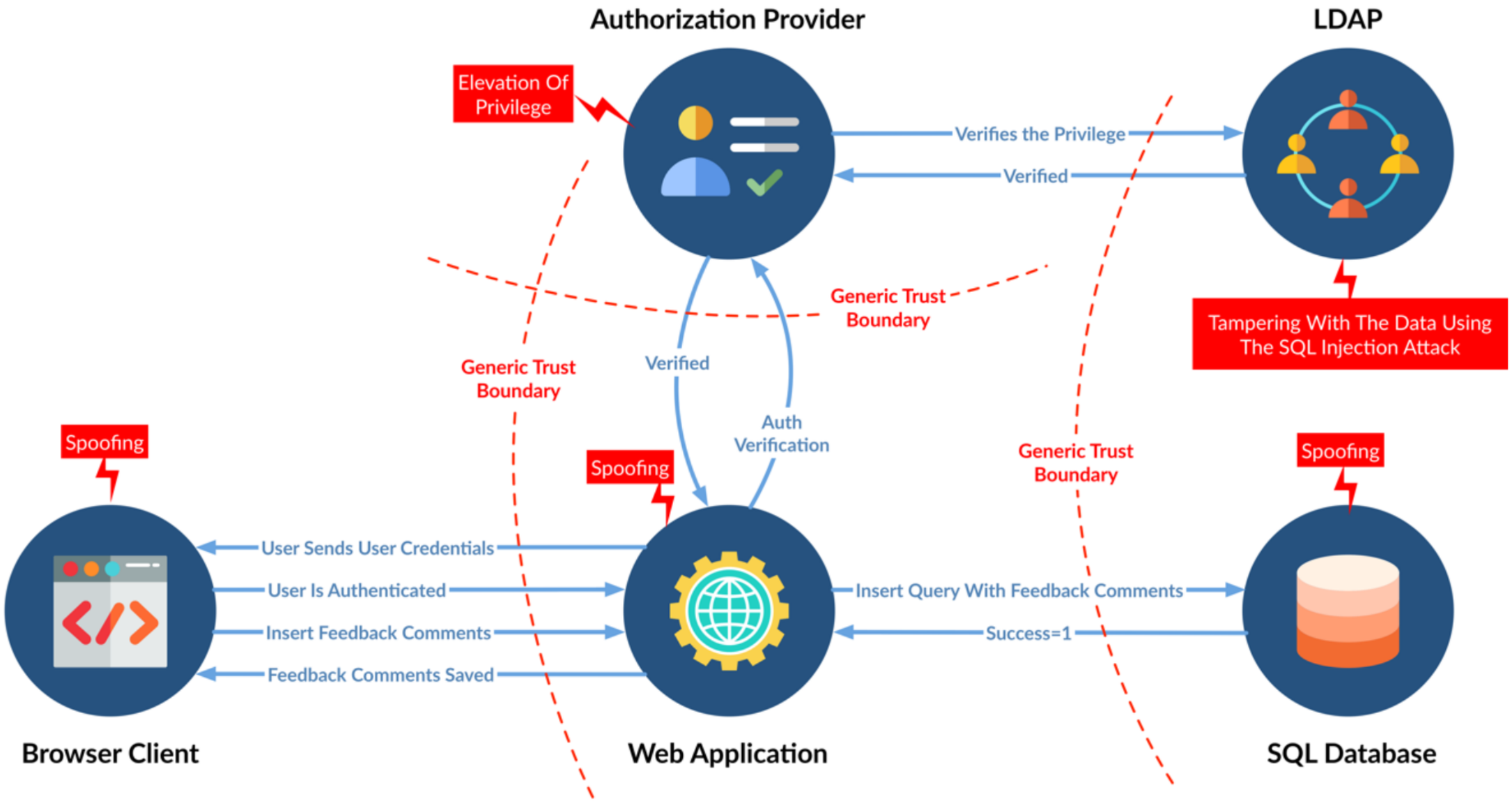
Attacker has unauthorized access to data
How do I know someone is allowed to take this action?

Strong security

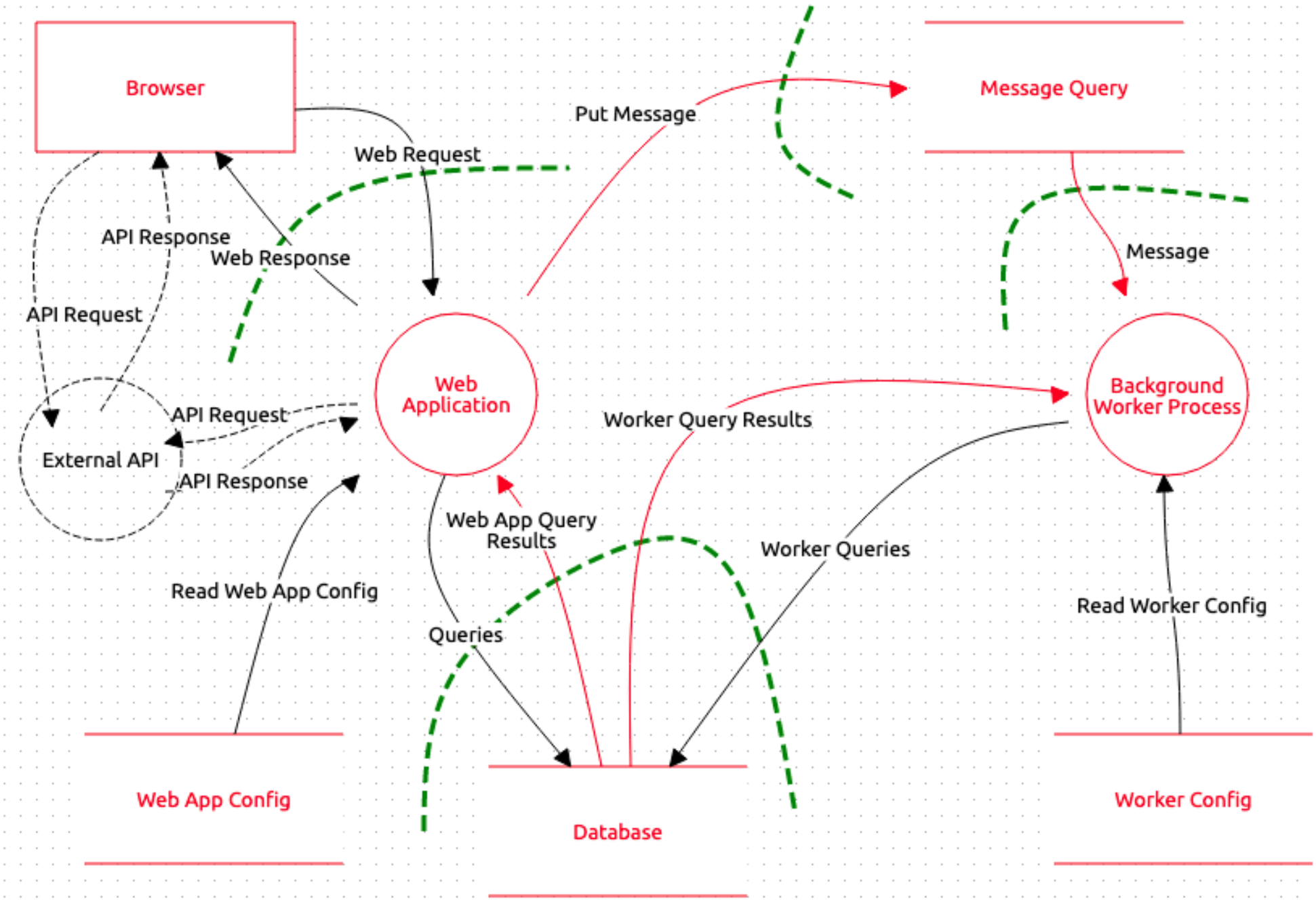
Principle of lease privilege

Multi-factor Authentication (MFA)

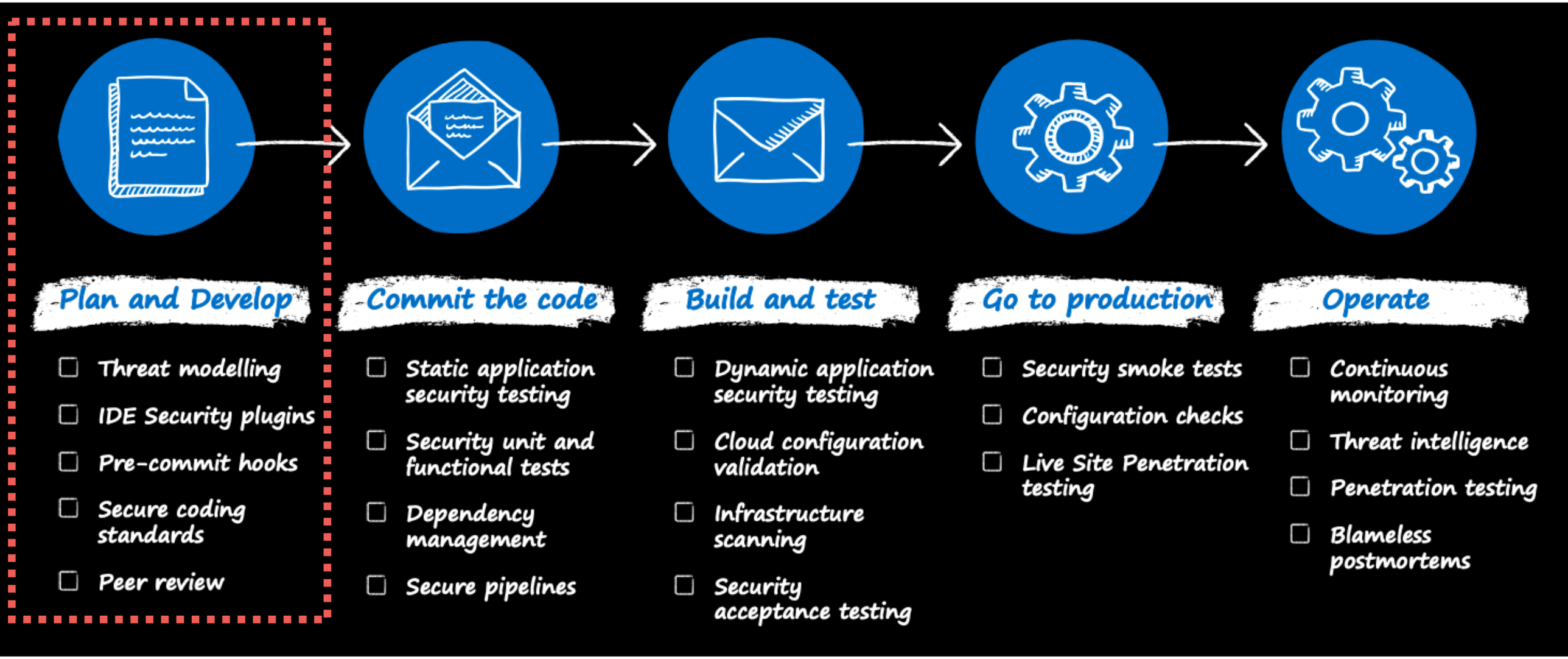
Start with current Architecture



Start with current Architecture



Plan and Develop



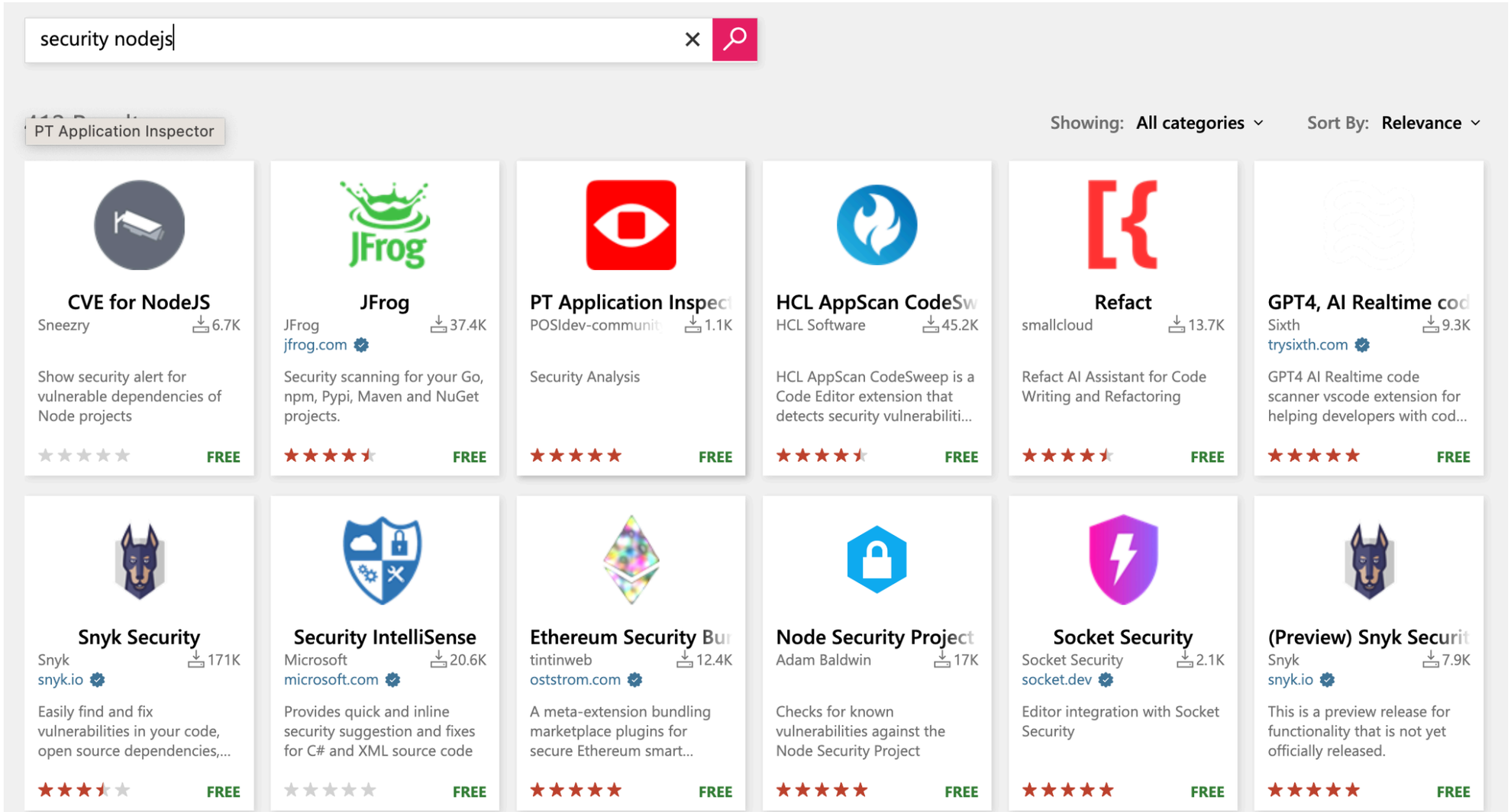
https://learn.microsoft.com/en-us/azure/cloud-adoption-framework/secure/devsecops-controls

Plan and Develop

Threat modeling
IDE security plugins
Pre-commit hooks
Peer reviews and secure coding standard

IDE Security Plugins

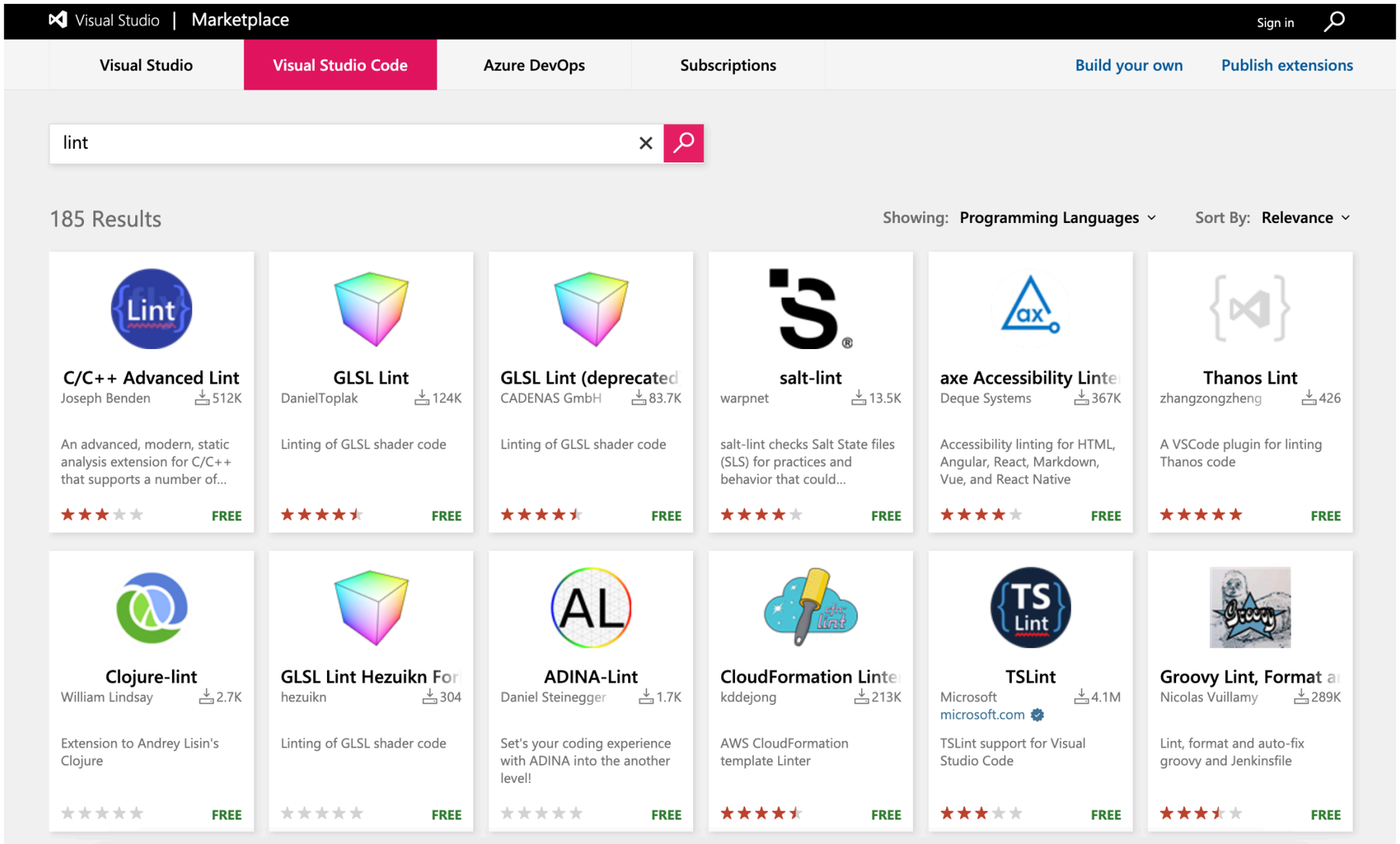
Lint and Static code analysis



https://marketplace.visualstudio.com/vscode

IDE Security Plugins

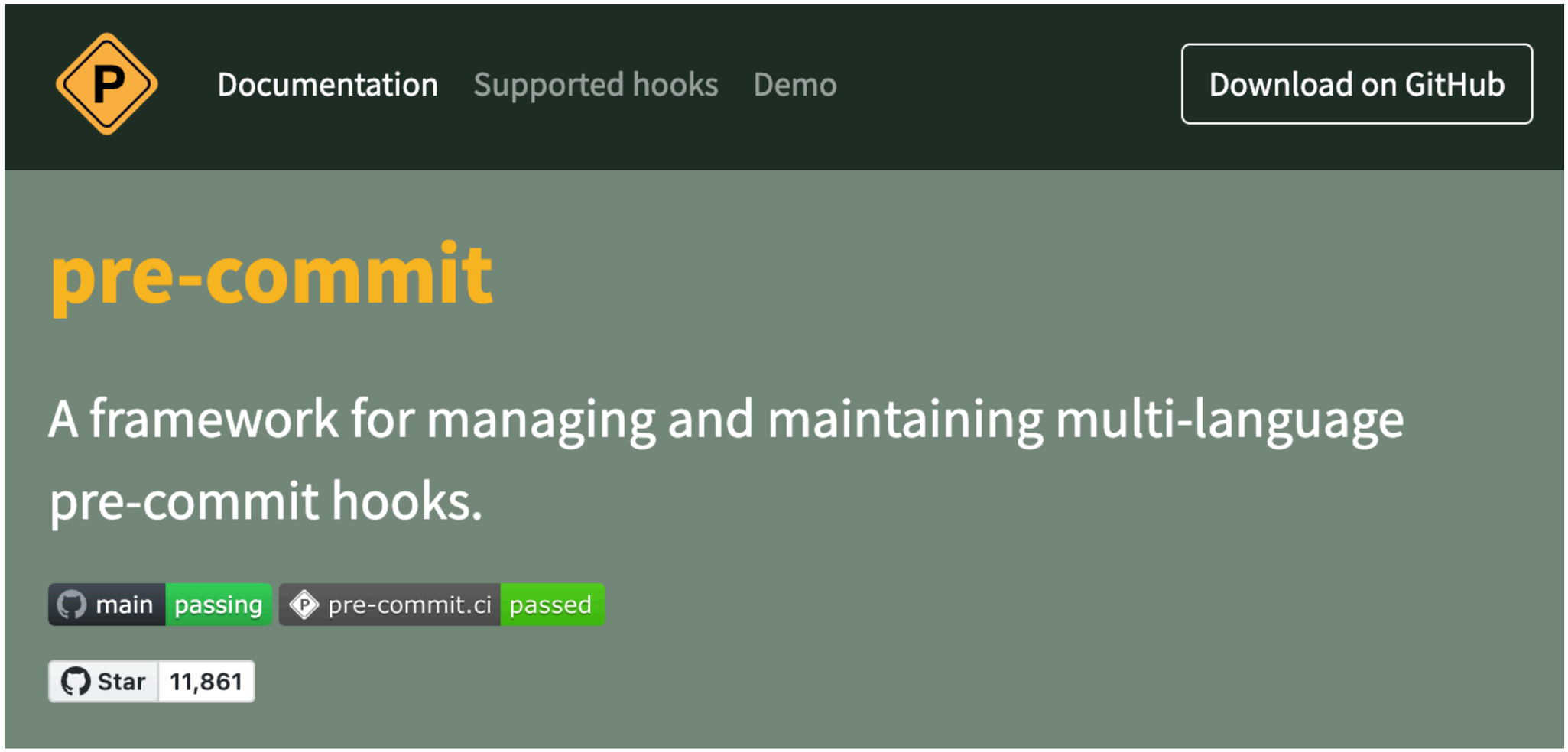
Lint and Static code analysis



https://marketplace.visualstudio.com/vscode

Git pre-commit hooks

Self-test in developer machine (fast feedback)



https://pre-commit.com/

Git pre-commit hooks

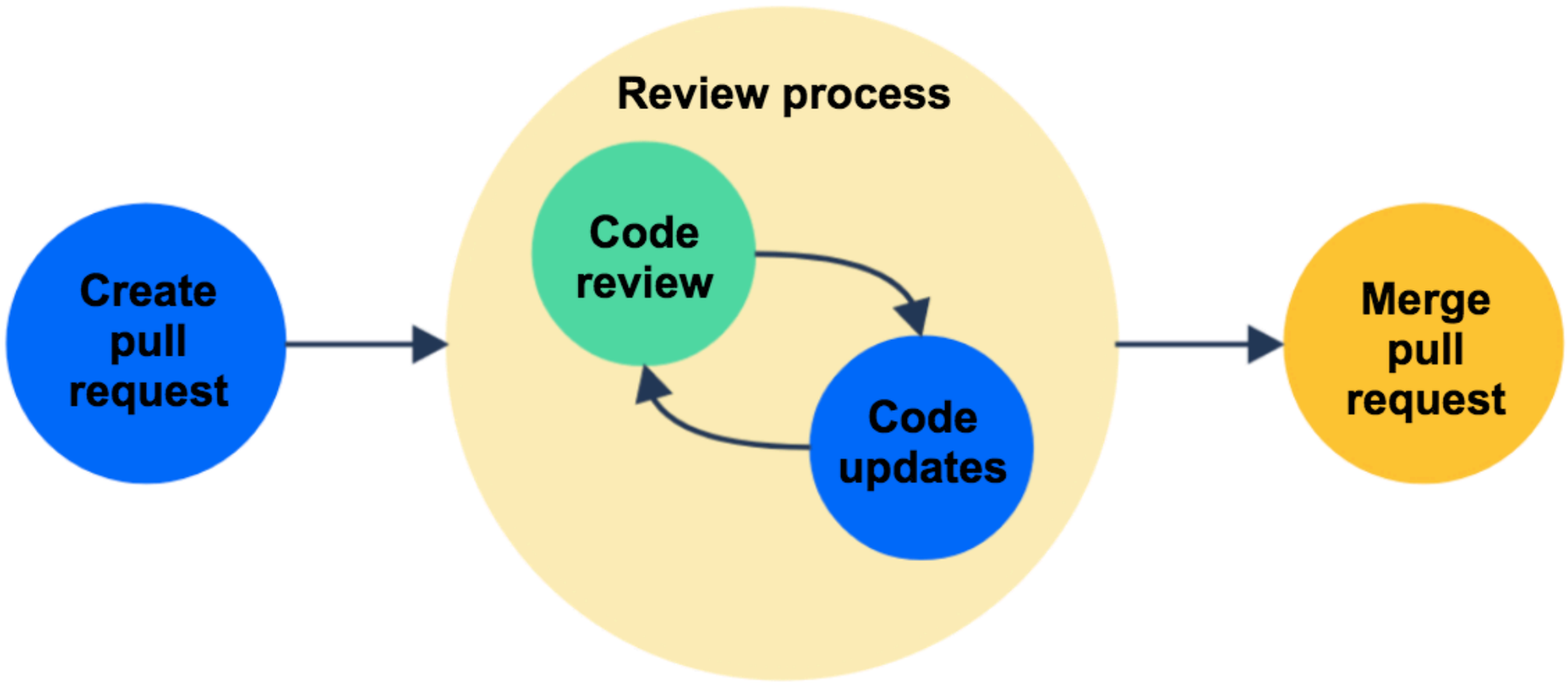
$git commit -m "fix(faker): credit card from faker error”

```
✔ Preparing lint-staged...
✔ Running tasks for staged files...
✔ Applying modifications from tasks...
✔ Cleaning up temporary files...
```

https://typicode.github.io/husky/

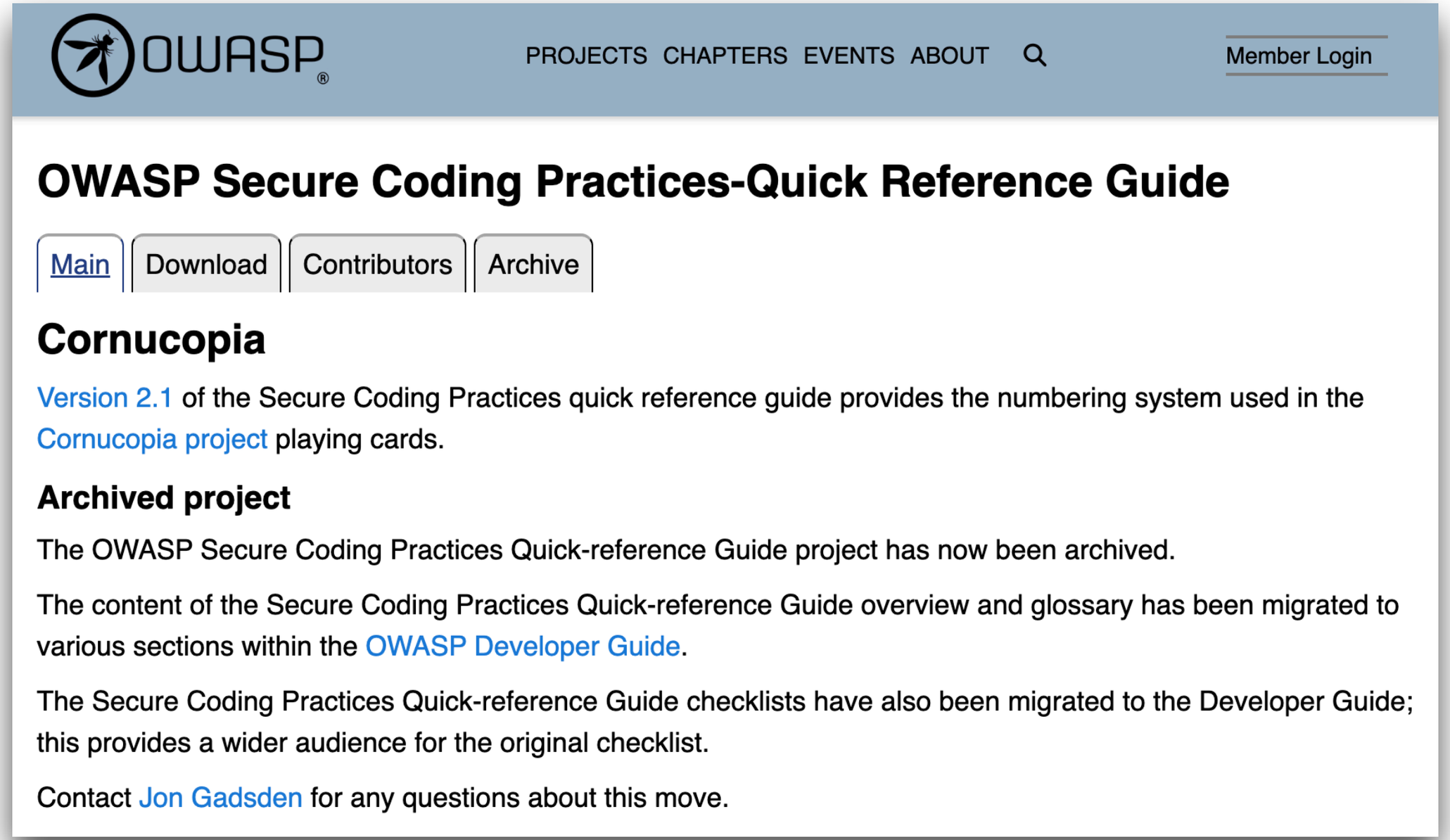
Peer Review and Secure coding standard

Use pull request (PR) and review



https://support.atlassian.com/bitbucket-cloud/docs/use-pull-requests-for-code-review/

OWASP Secure Coding Practices



https://owasp.org/www-project-secure-coding-practices-quick-reference-guide/

When develop committed code …

Dependency checking
Static Application Security Testing (SAST)
Security pipeline
Dynamic Application Security Testing (DAST)

Dependency Checking

OWASP Dependency -Check

GitHub Dependabot

NPM audit

https://owasp.org/www-project-dependency-check/

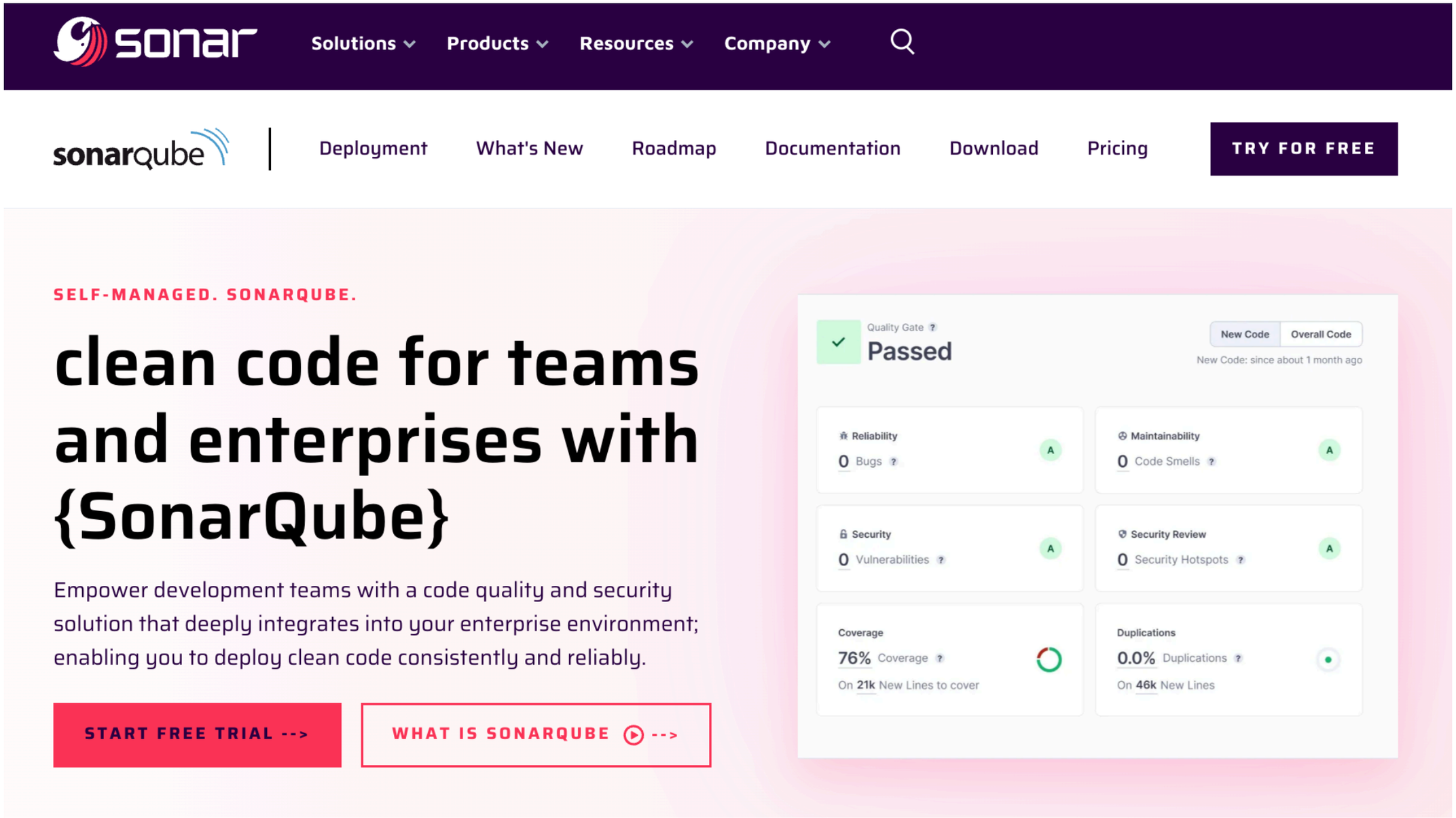
Static Application Security Testing (SAST)

Static Code Analysis (detect 50%)
Scan and review code
Identify source of vulnerabilities
White-box testing

Must be integrate into development process to help development team

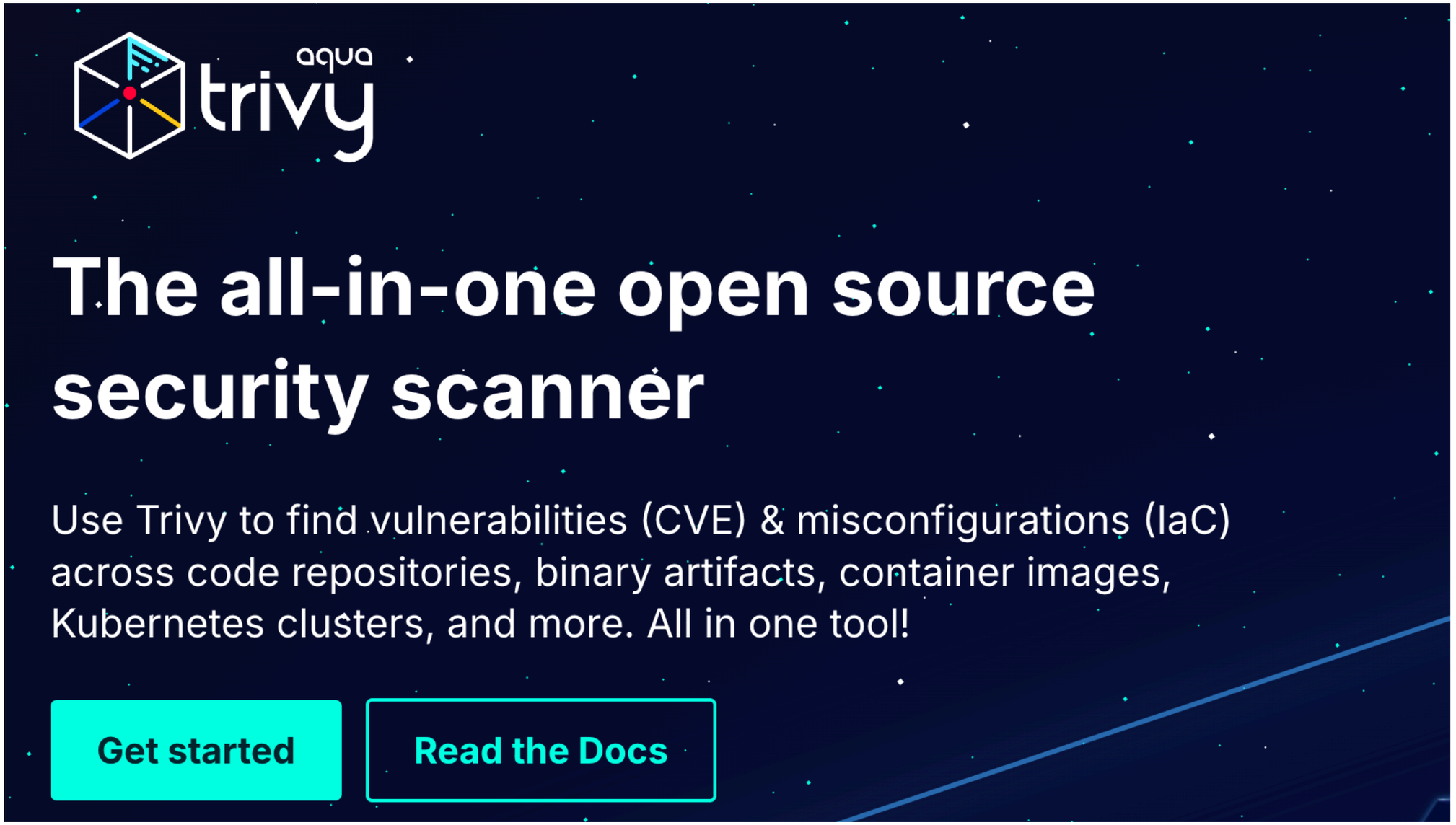
https://en.wikipedia.org/wiki/Static_application_security_testing

SonarQube



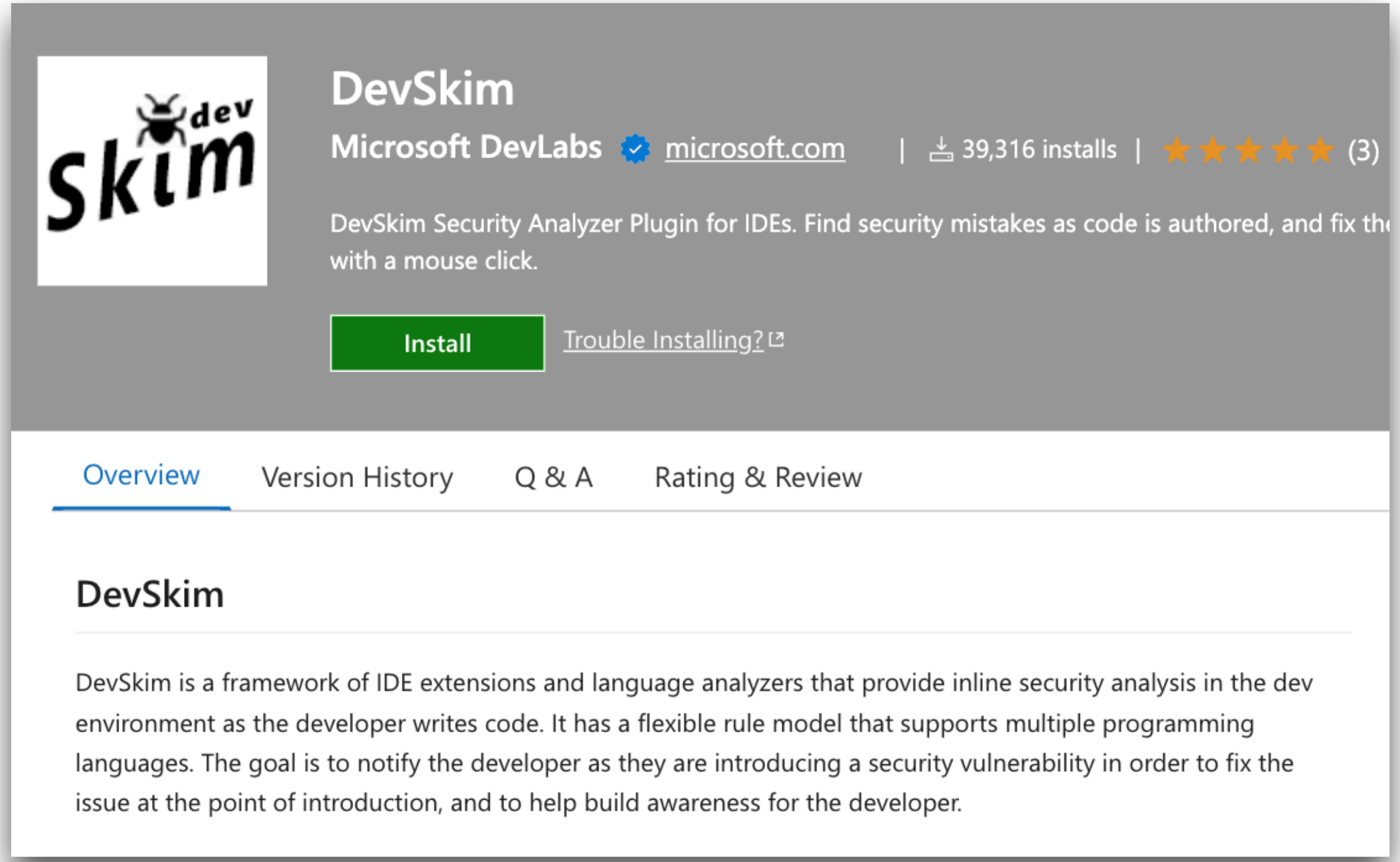
https://www.sonarsource.com/products/sonarqube/

Trivy



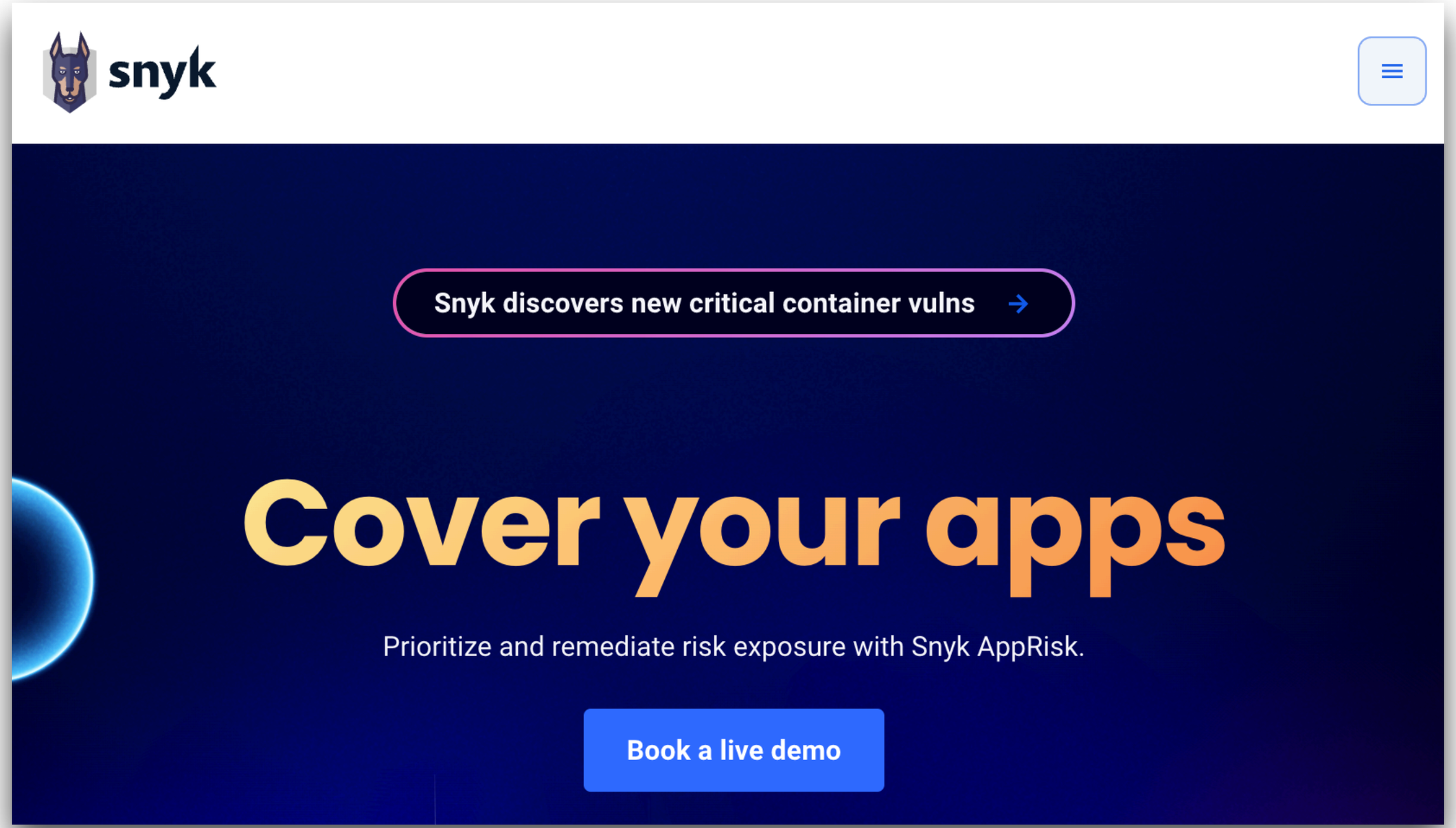
https://trivy.dev/latest/

DevSkim



https://marketplace.visualstudio.com/items?itemName=MS-CST-E.vscode-devskim

Snyk



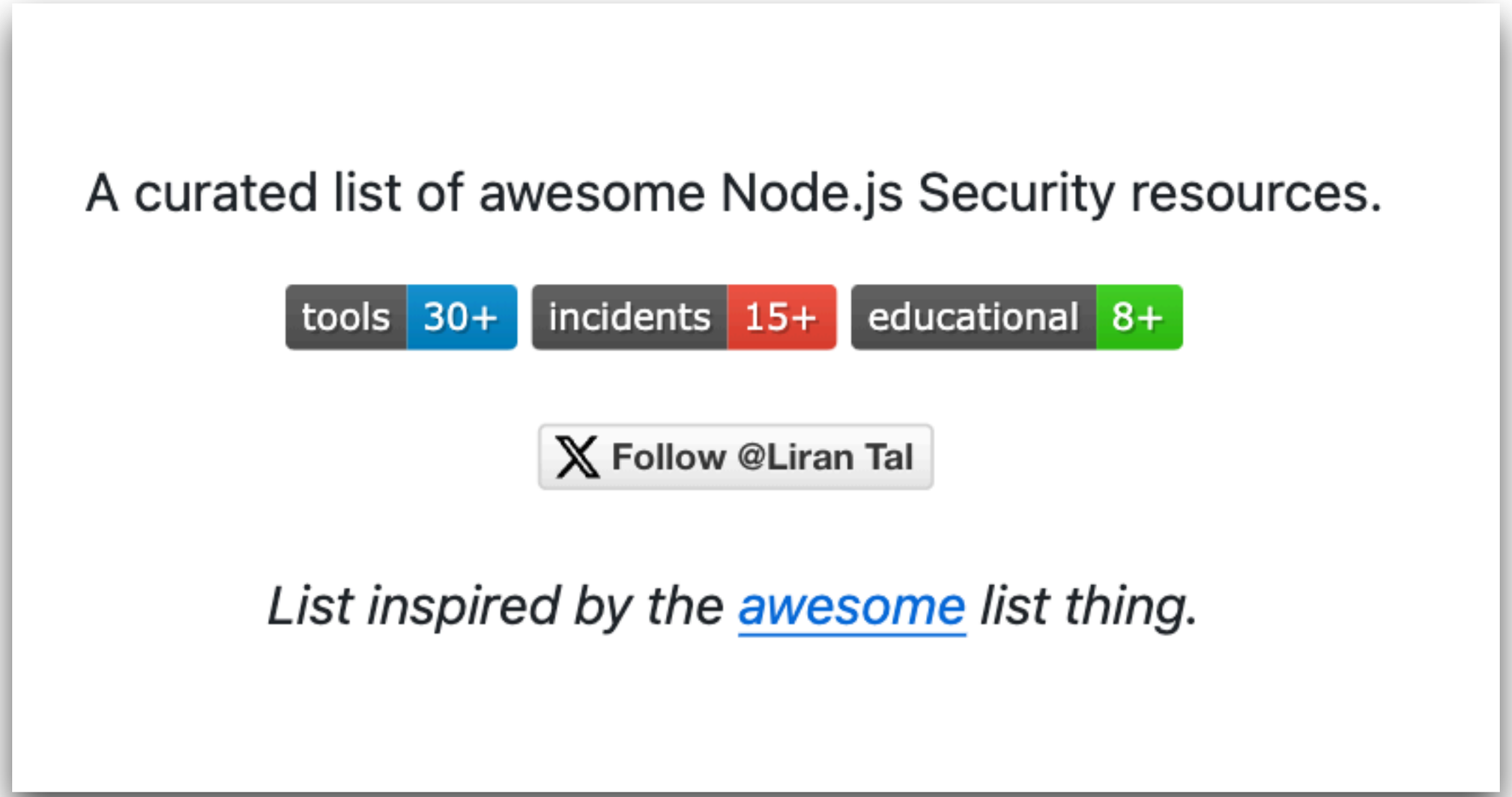
https://snyk.io/

More tools

Lint	Scan secret/ credential
ES/TS Lint	**Git-secrets GitLeaks**

https://owasp.org/www-community/Source_Code_Analysis_Tools

NodeJS



https://github.com/lirantal/awesome-nodejs-security

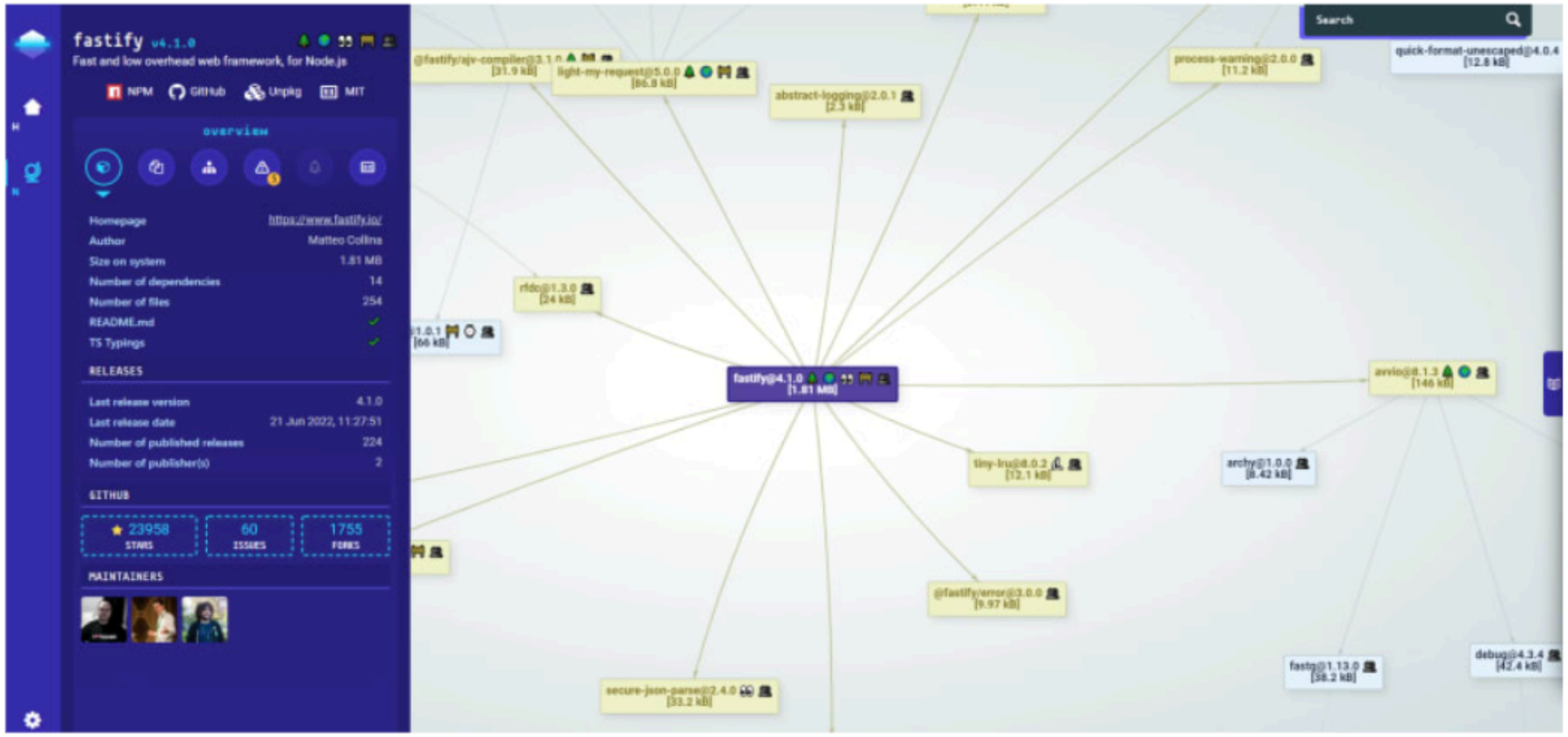
Node Secure CLI

🐢 Node-Secure CLI 🚀

a Node.js CLI to deeply analyze the dependency tree of a given NPM package or Node.js local app

VERSION V2.4.0 | LICENSE MIT | OPENSSF SCORECARD 8.8 | SLSA LEVEL 3 | BUILD PASSING

COVERAGE 100%

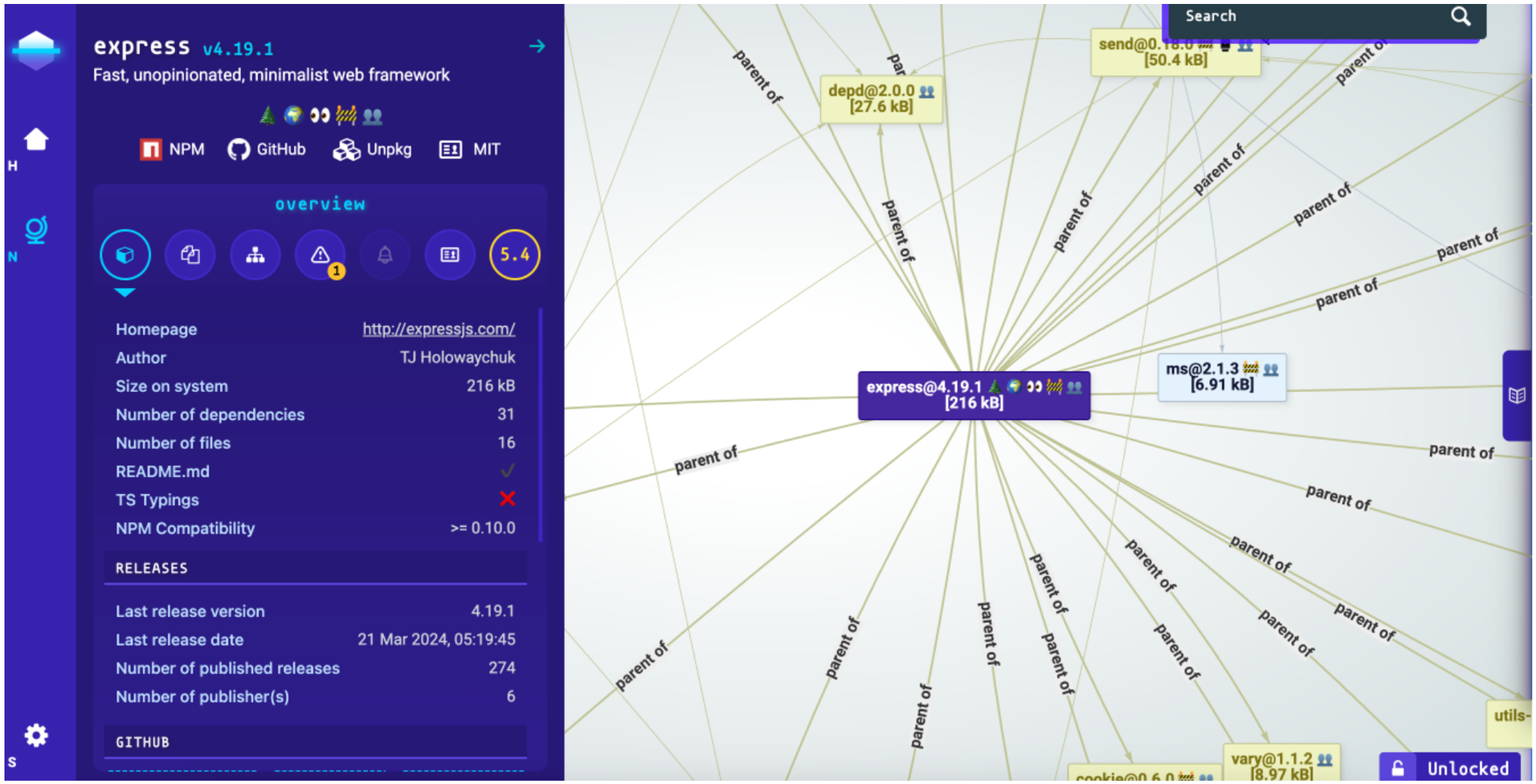


https://github.com/NodeSecure/cli

Node Secure CLI

$npm install -g @nodesecure/cli

$nsecure auto express



Bearer CLI

CYGIVES POWERED BY cycode

Bearer is part of Cygives, the community hub for free & open developer security tools. Learn more

bearer by cycode

Scan your source code against top **security** and **privacy** risks.

Bearer is a static application security testing (SAST) tool designed to scan your source code and analyze data flows to identify, filter, and prioritize security and privacy risks.

Bearer offers a free, open solution, Bearer CLI, and a commercial solution, Bearer Pro, available through Cycode.

Getting Started - FAQ - Documentation - Report a Bug

release v1.49.0 | Unit Tests passing | Contributor Covenant 2.1

https://github.com/Bearer/bearer

Bearer CLI

Build-in rules in many languages
Support OWASP Top 10 and CWE Top 25
Privacy risks
Detect sensitive data

https://docs.bearer.com/reference/rules/

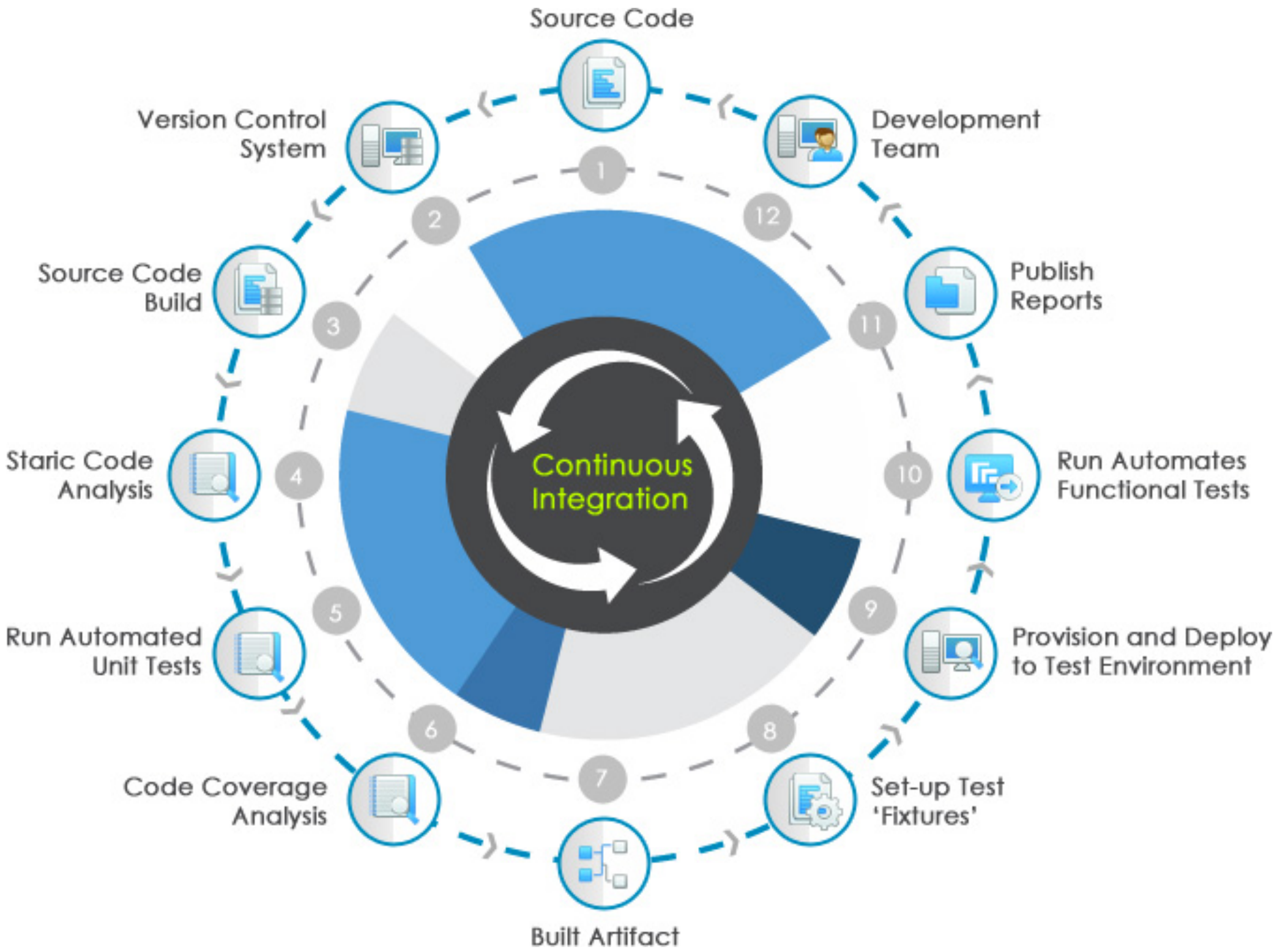
Security Pipeline

Security Pipeline

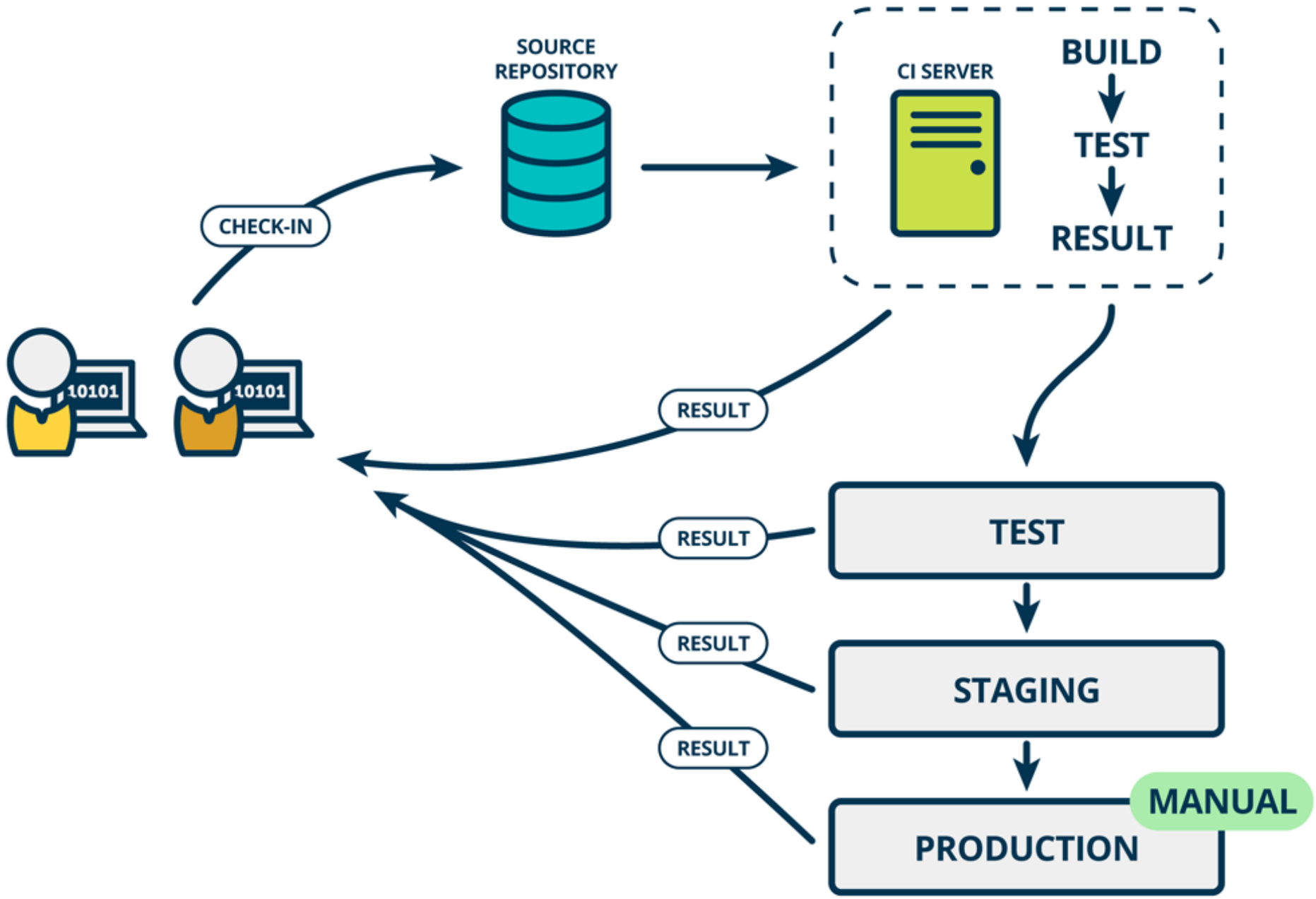
Implement security control in pipeline
Continuous Integration and Delivery

Build -> Test -> Deploy -> Monitoring

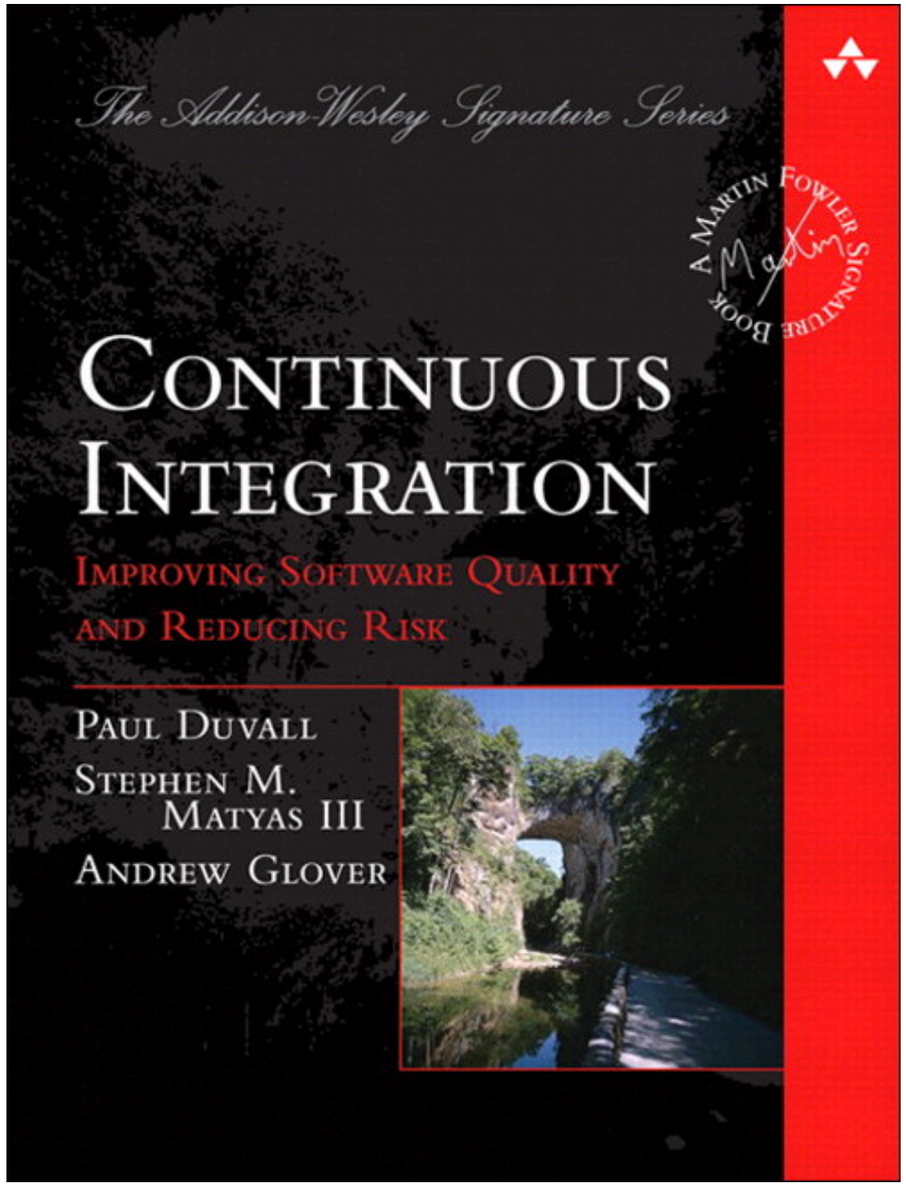
Continuos Integration

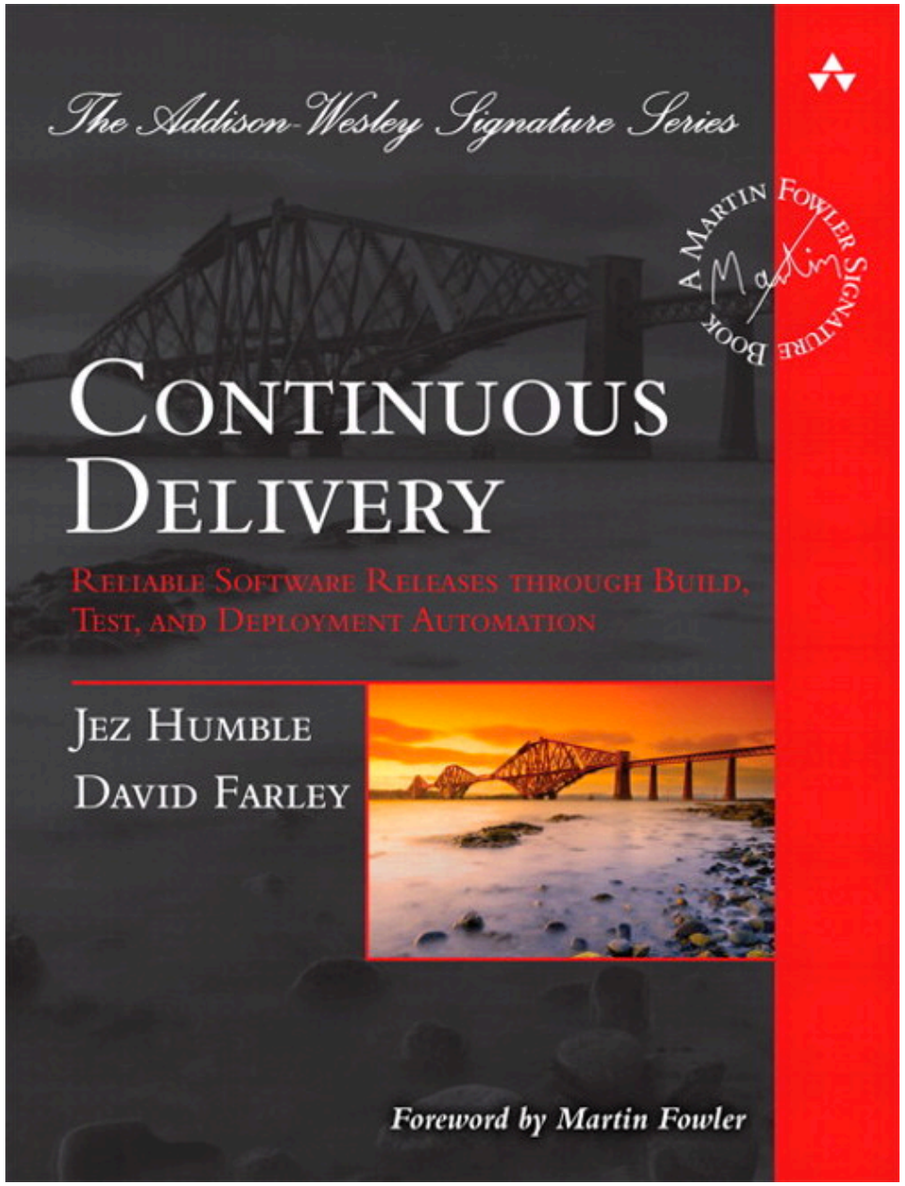


Continuous Delivery



Improve quality and reduce risk





Continuous Integration

Discipline to **integrate frequently**

Continuous Integration

Strive to make **small change**

Continuous Integration

Strive for **fast feedback**

Continuous Integration

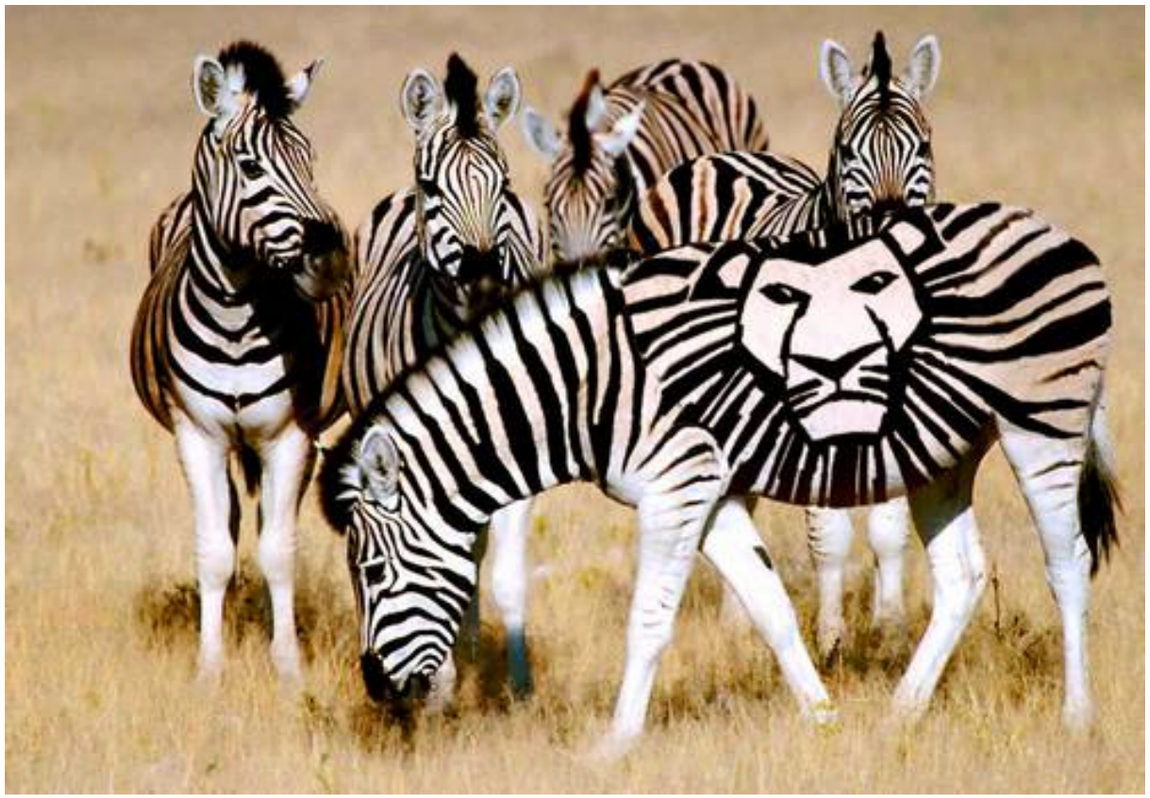
is a Software development **practices**

Workshop

Practice 1

Maintain a single source repository

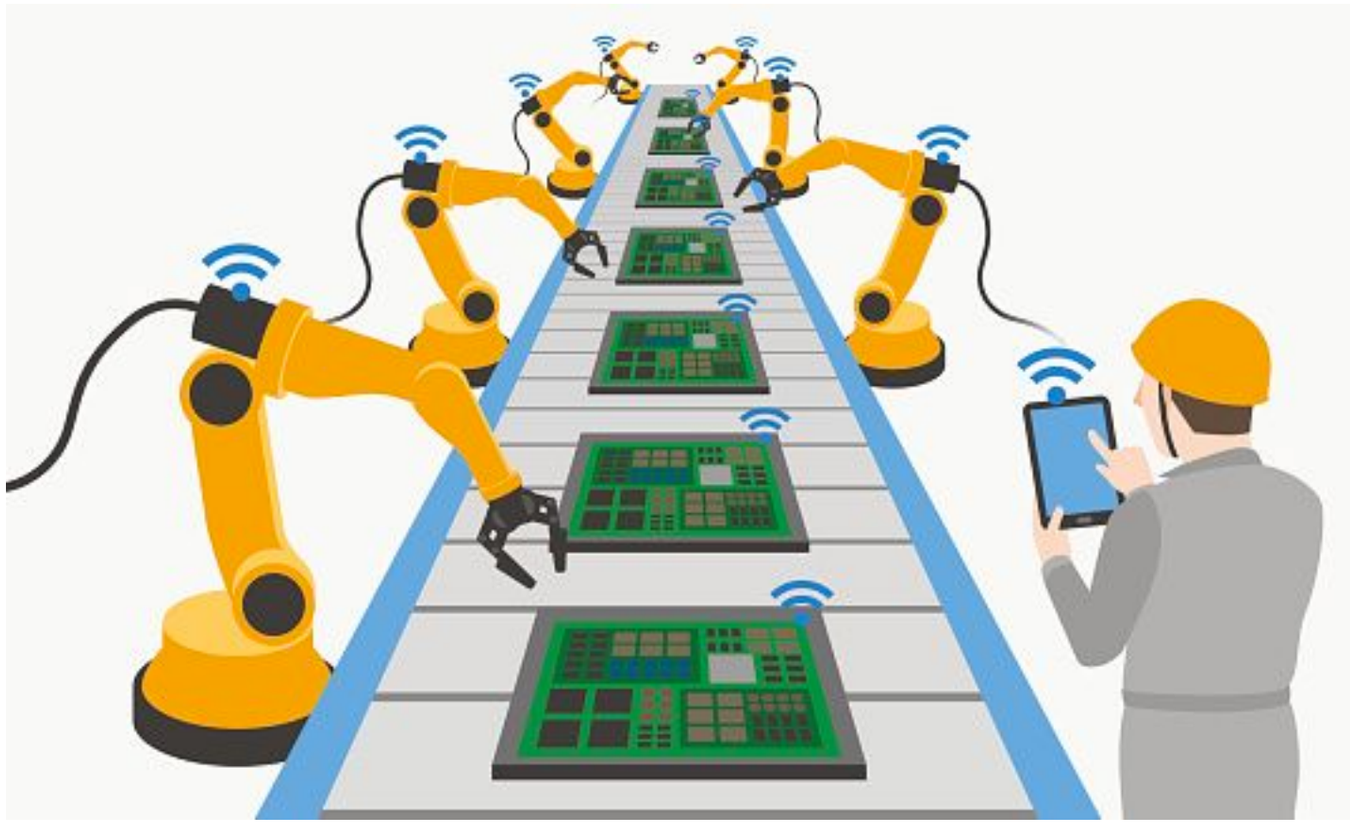
In general, you should store in source control everything you need to build anything



Practice 2

Automated the build

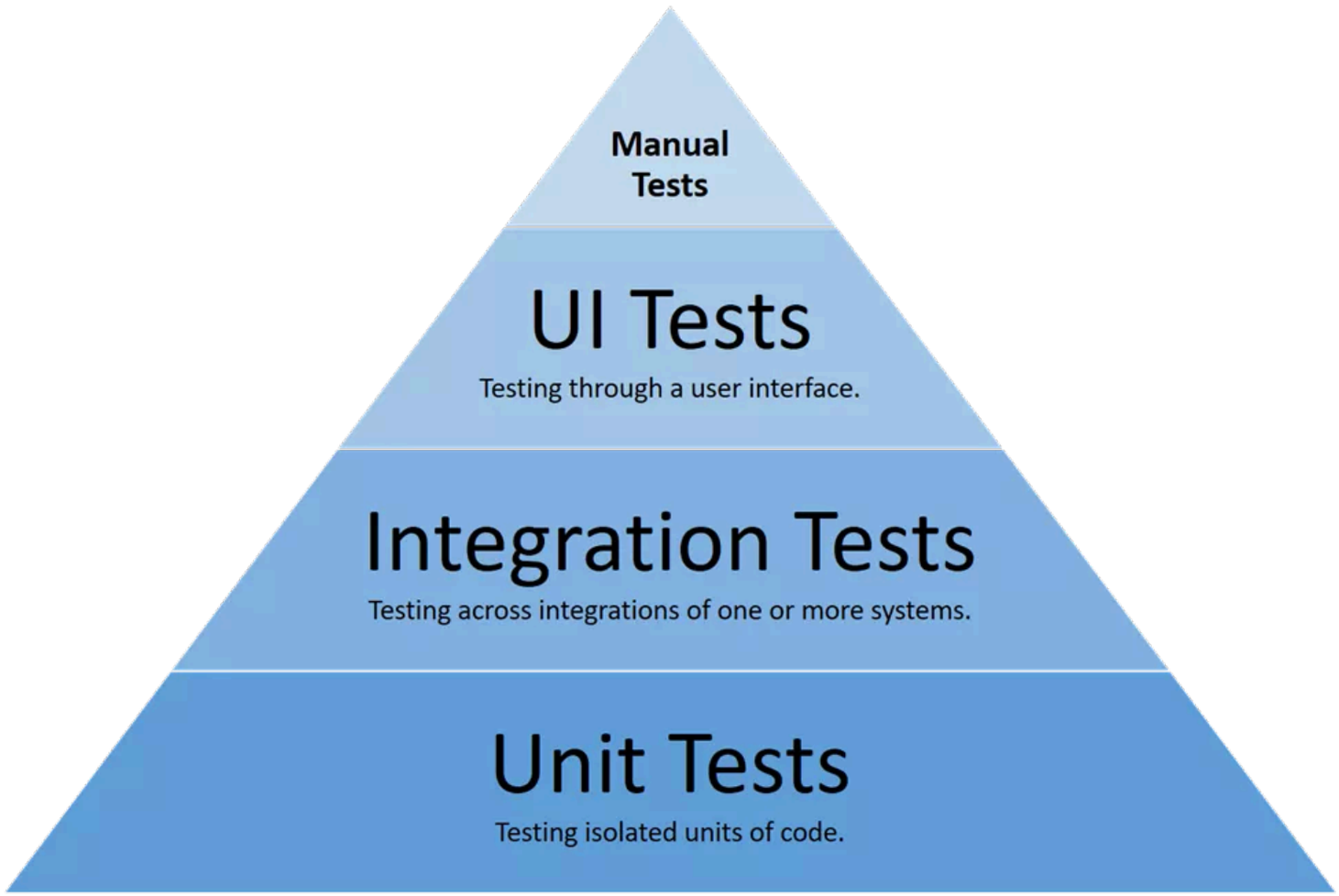
Automated environment for builds



Practice 3

Make your build **self-testing**

Build process => compile, linking and **testing**

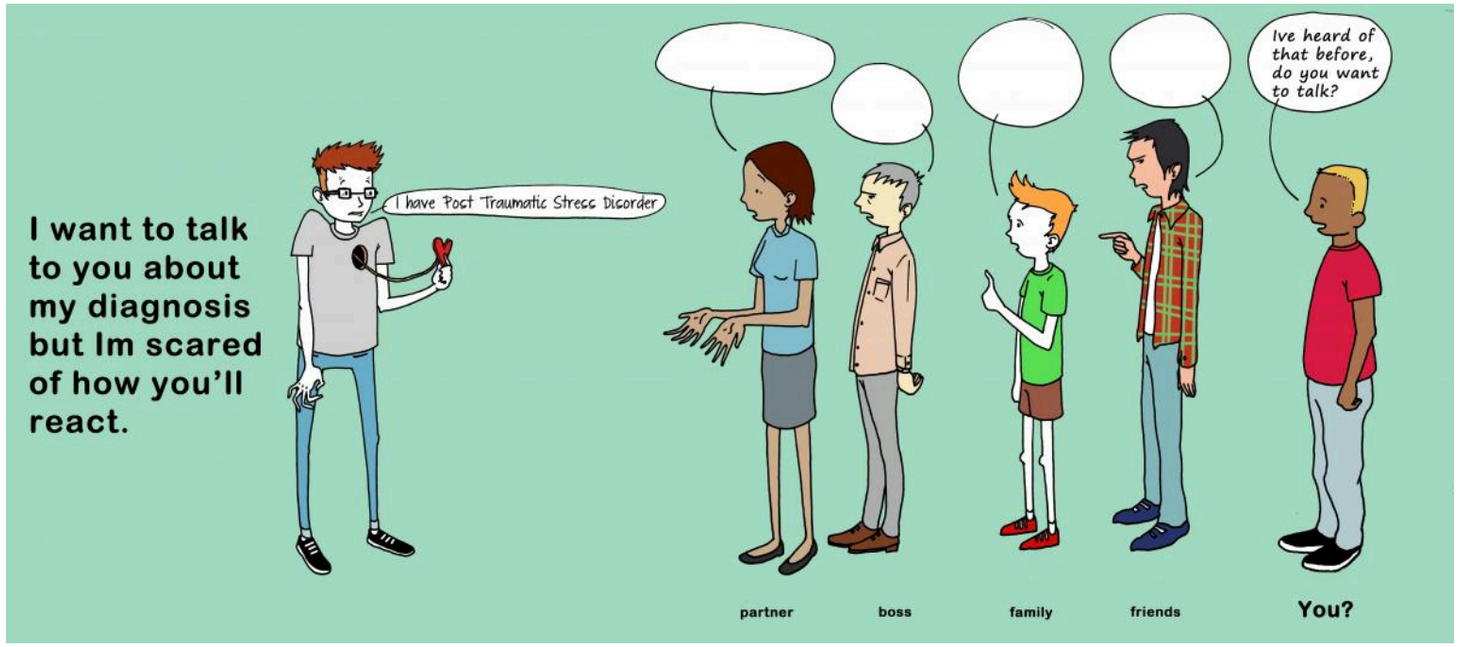


Practice 4

Everyone **commits** to the mainline everyday

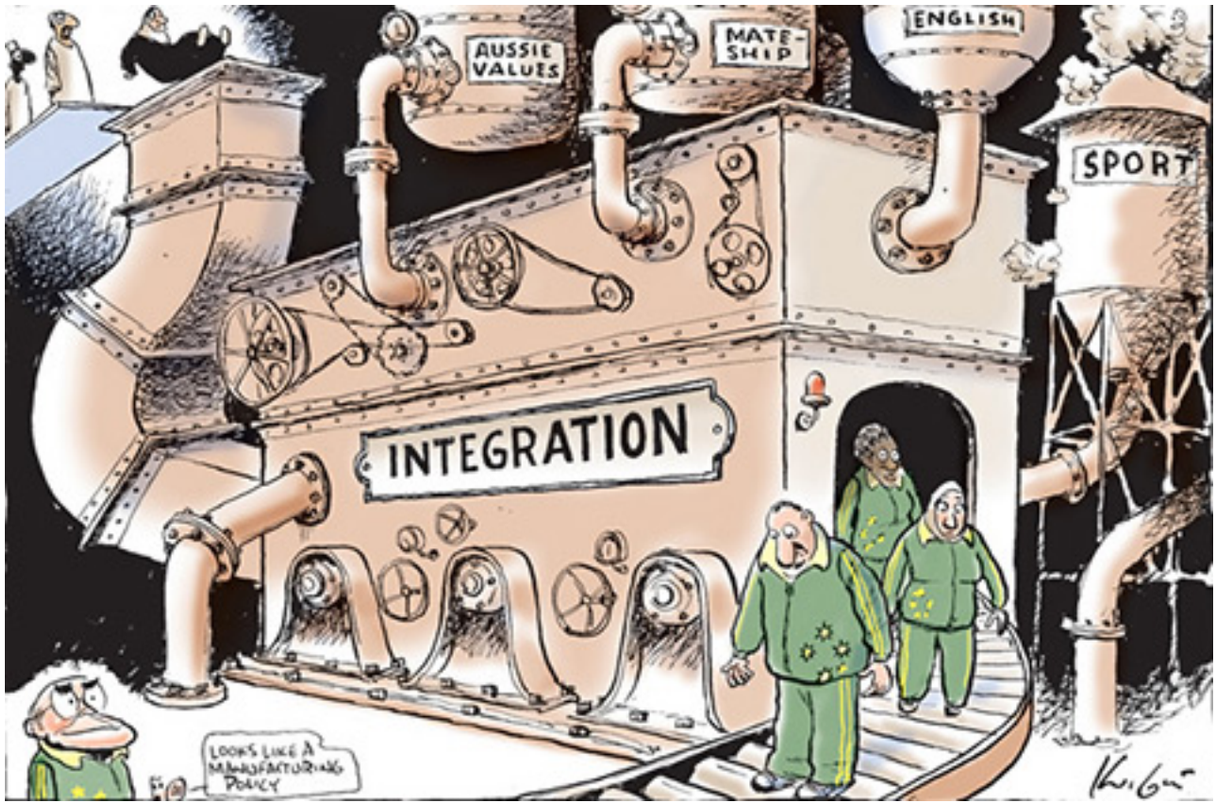
Integration is about **communication**

Integration allows developers to **tell** other developers



Practice 5

Every commits should build the mainline on an **Integration machine**



Practice 6

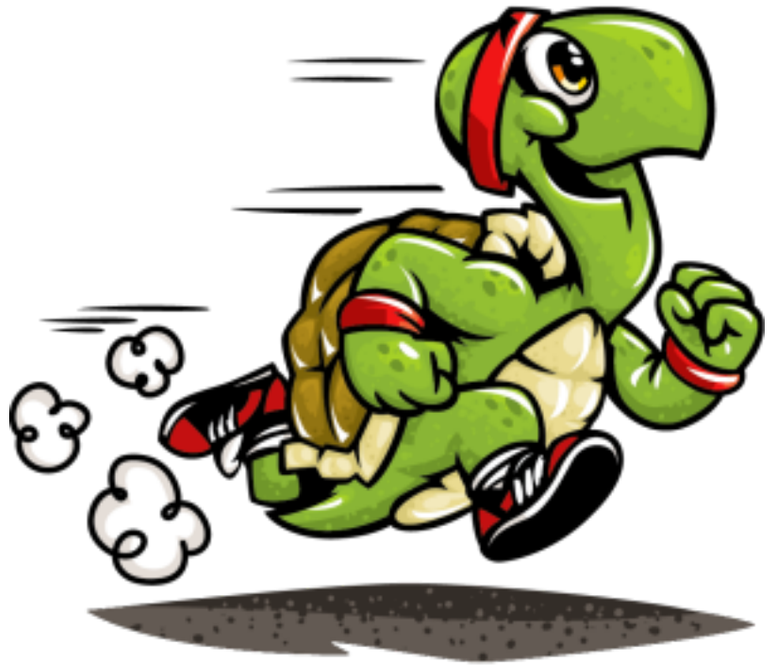
Fix broken builds **immediately**

"Nobody has a higher priority task than fixing the build"

Practice 7

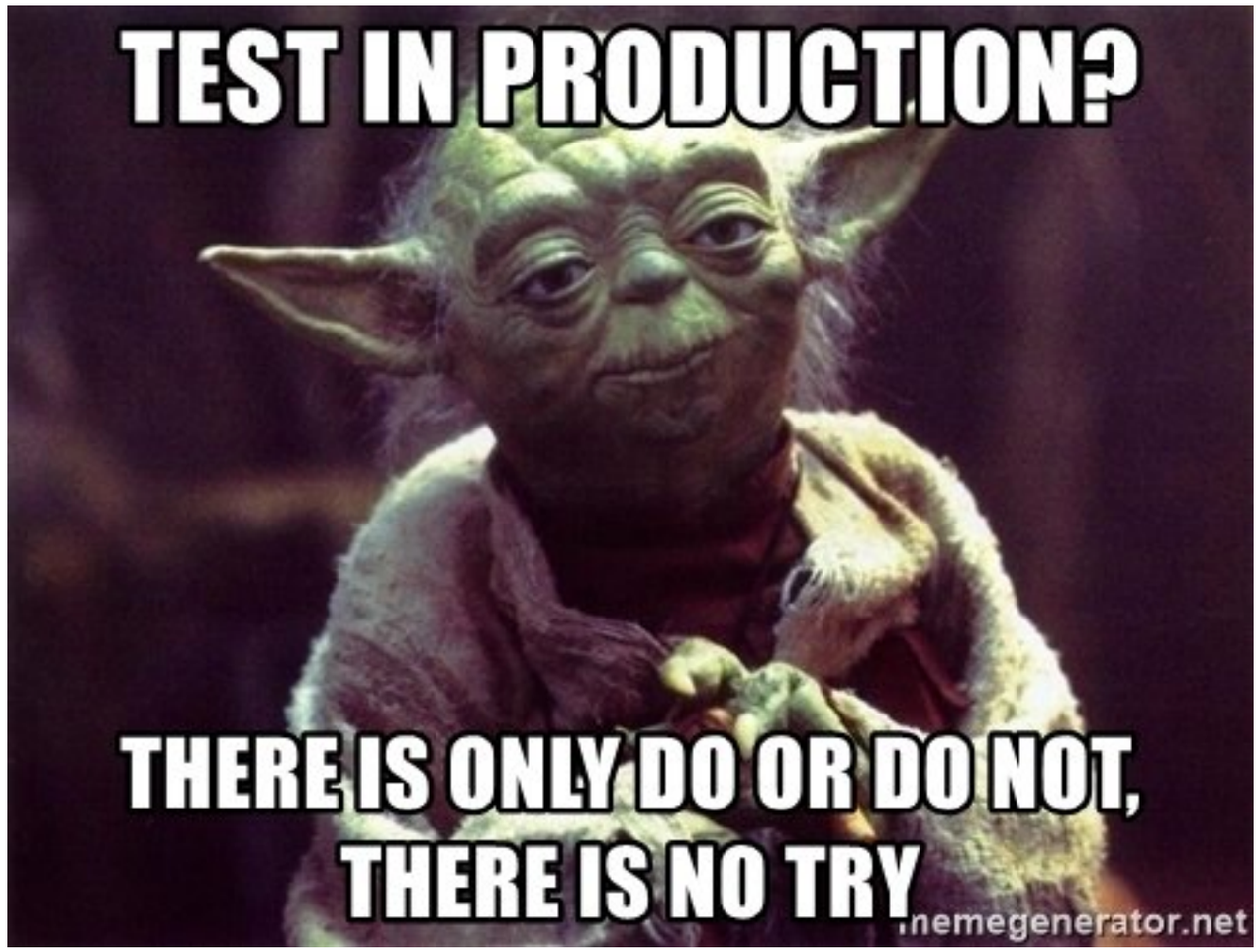
Keep the build **fast**

Continuous Integration is to provide rapid feedback



Practice 8

Test in clone of the **Production** environment



Practice 9

Make it easy for anyone to get
the latest executable

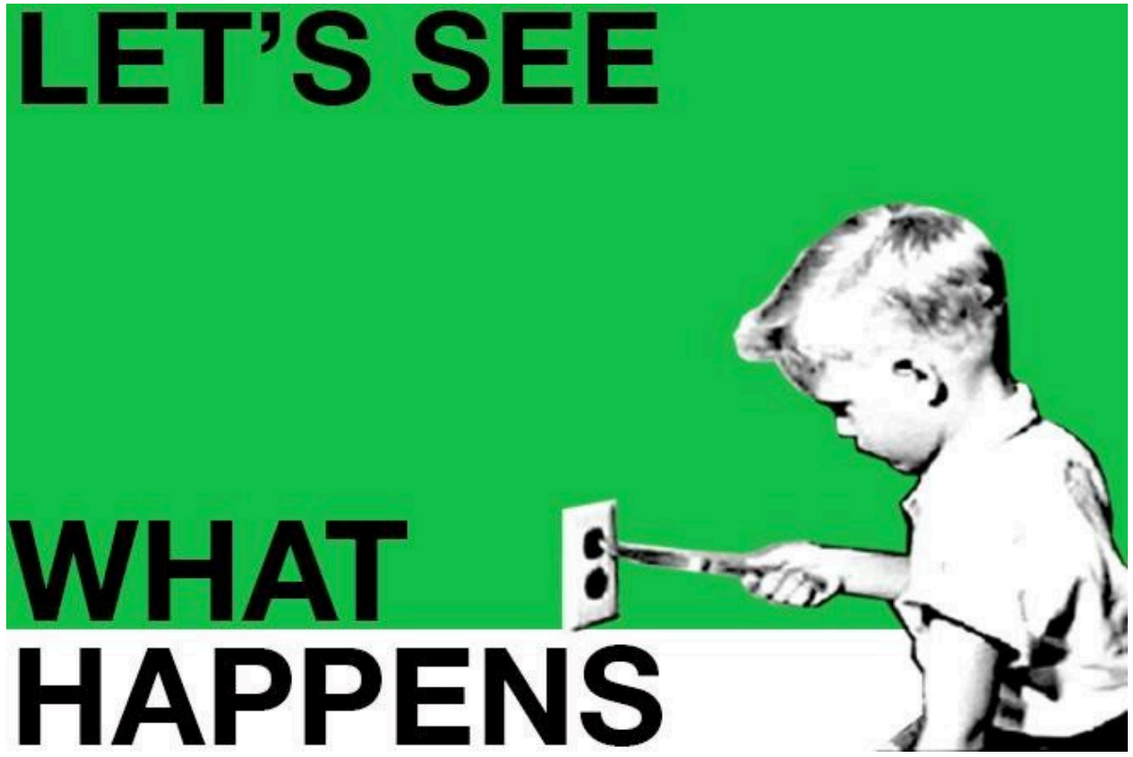
Make sure well known place where people can find

Practice 10

Everyone can see what's happening

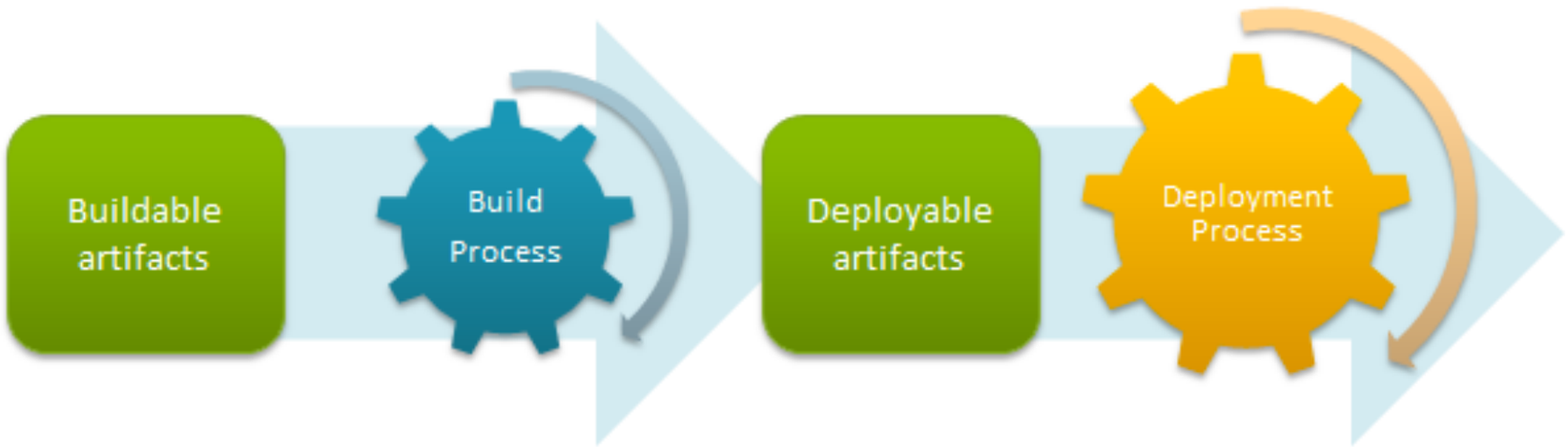
Easier to see the state of the system and changes

Show the good information

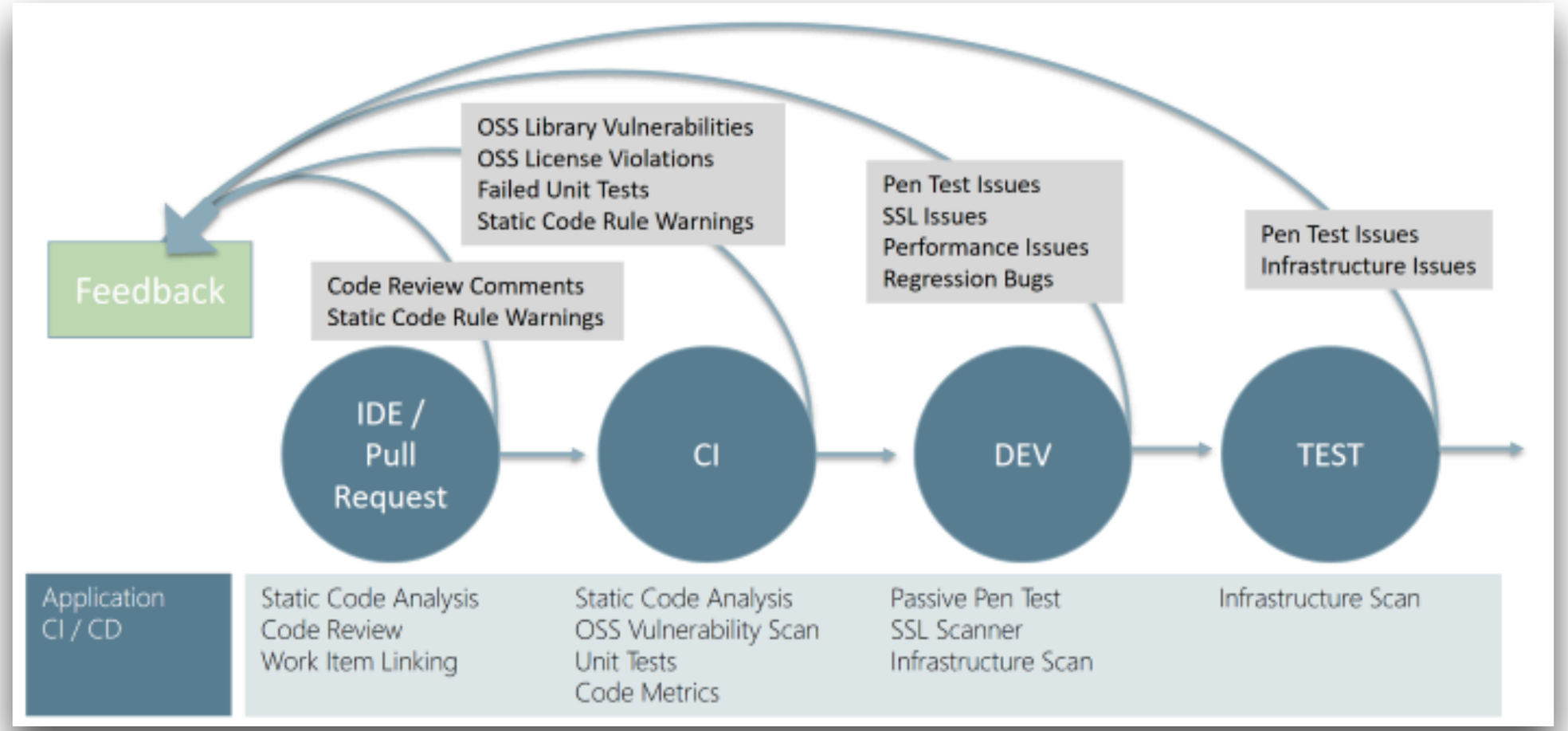


Practice 11

Automated deployment



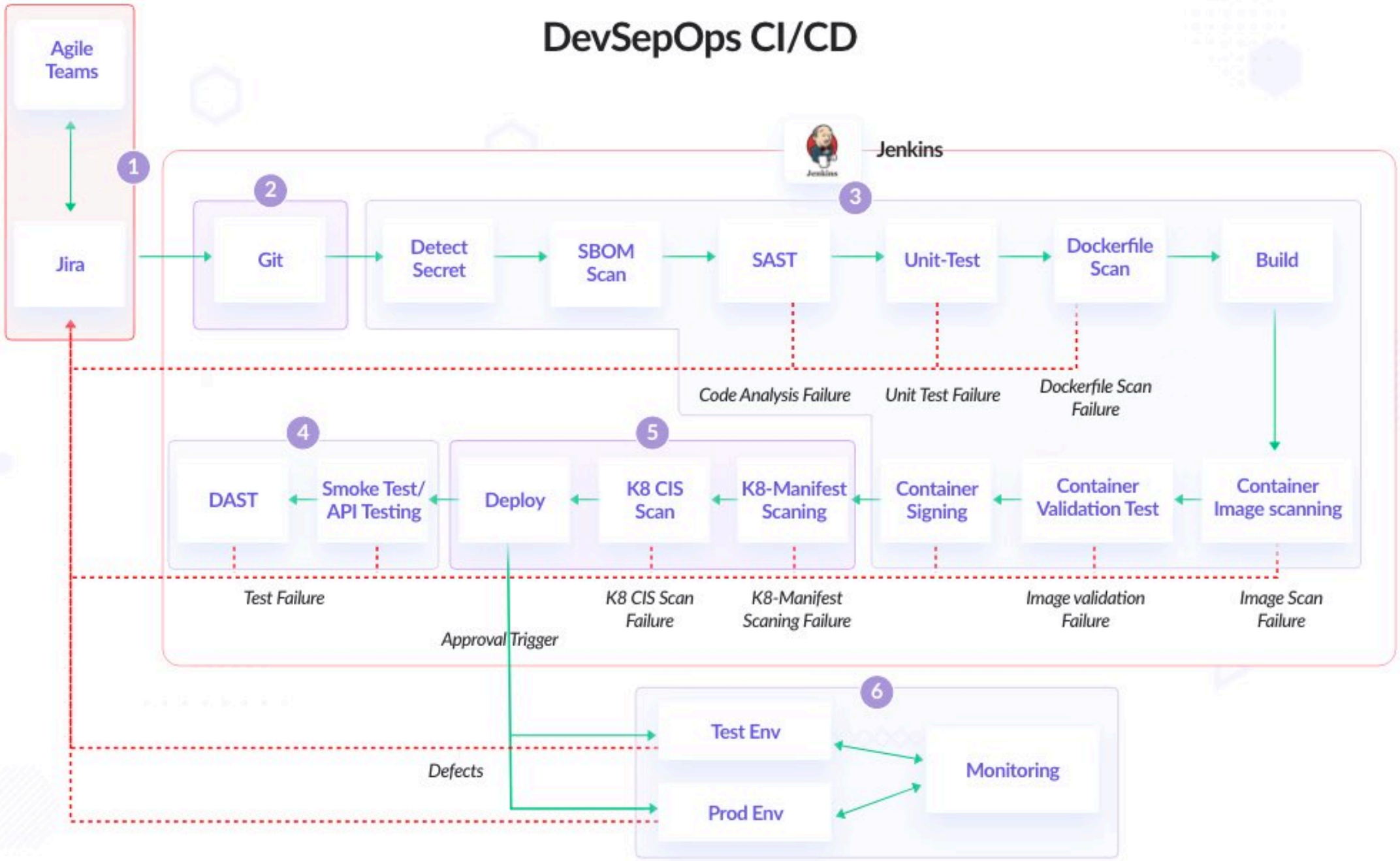
All about feedback loop



Workshop

Design your delivery process

DevSepOps CI/CD



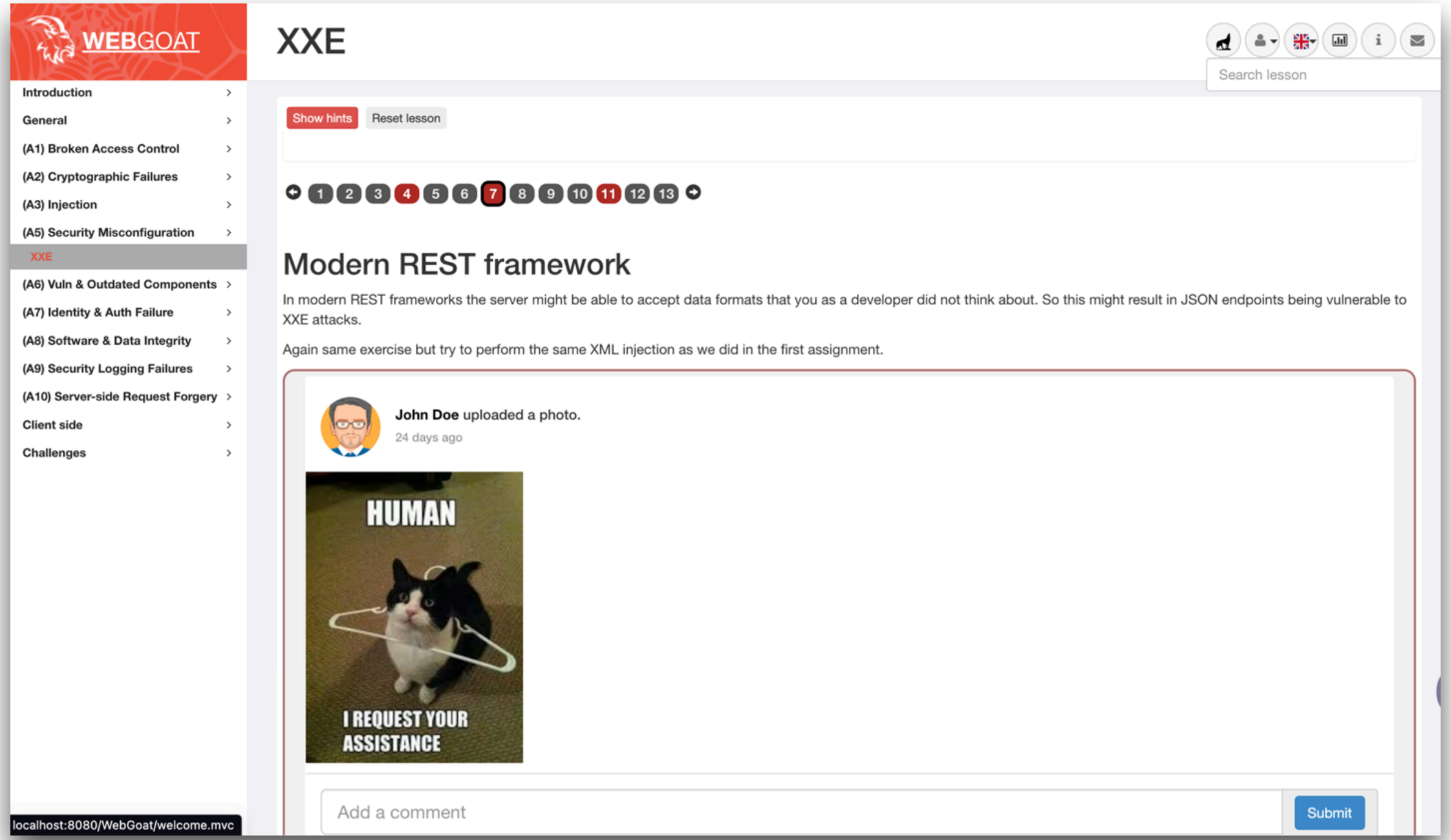
Workshop implement your pipeline

Application and framework to manage and monitor the executable of **repeated tasks**

CI/CD

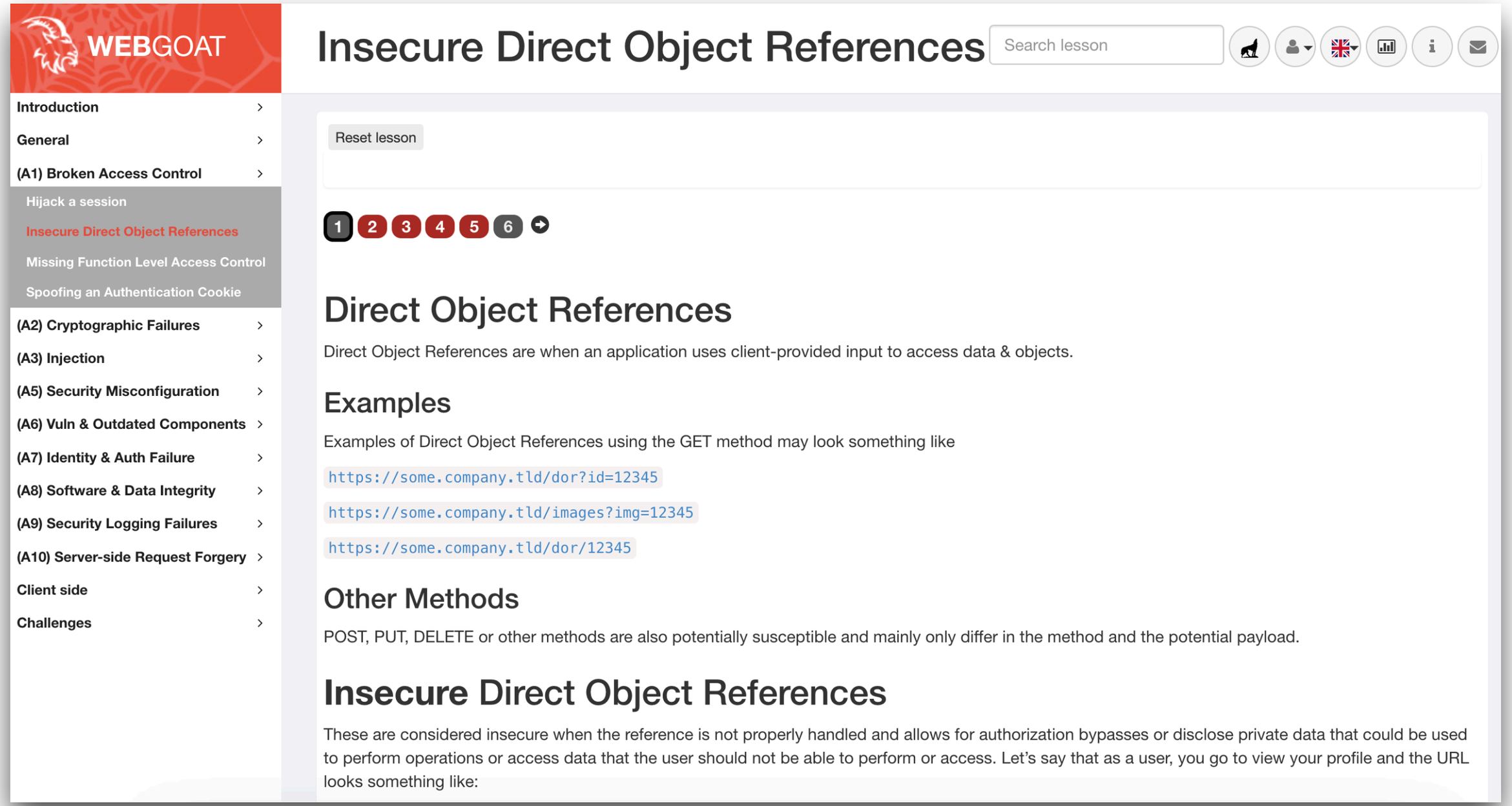
https://docs.gitlab.com/ci/

WebGoat



https://owasp.org/www-project-webgoat/

Broken Access Control



Application and framework to manage and monitor the executable of **repeated tasks**

Jenkins

https://jenkins.io/

OWASP Juice Shop

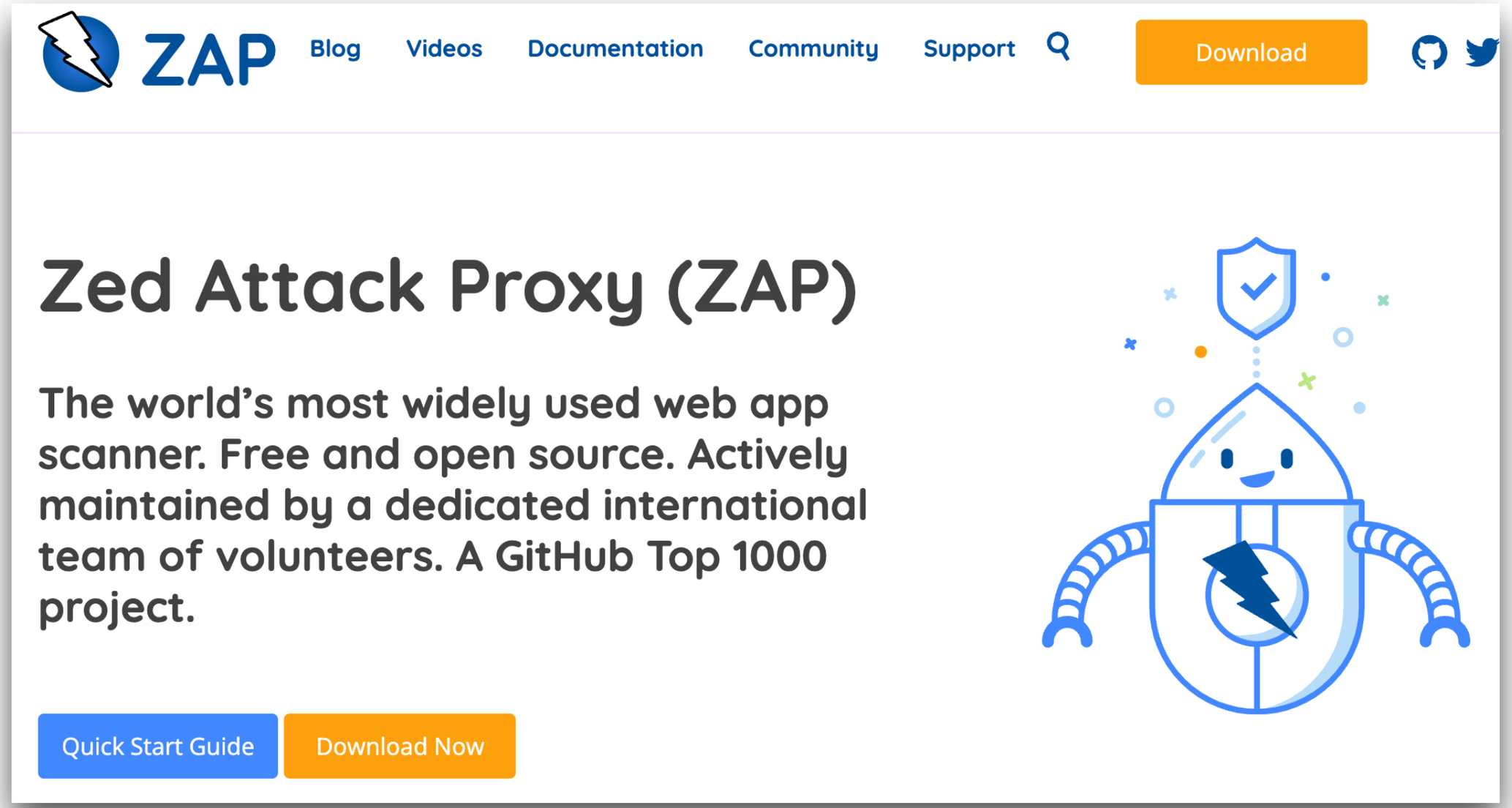
https://owasp.org/www-project-juice-shop/

Dynamic Application Security Testing (DAST)

Black-box testing
Non-functional testing
Interact with application (frontend or backend)

https://en.wikipedia.org/wiki/Dynamic_application_security_testing

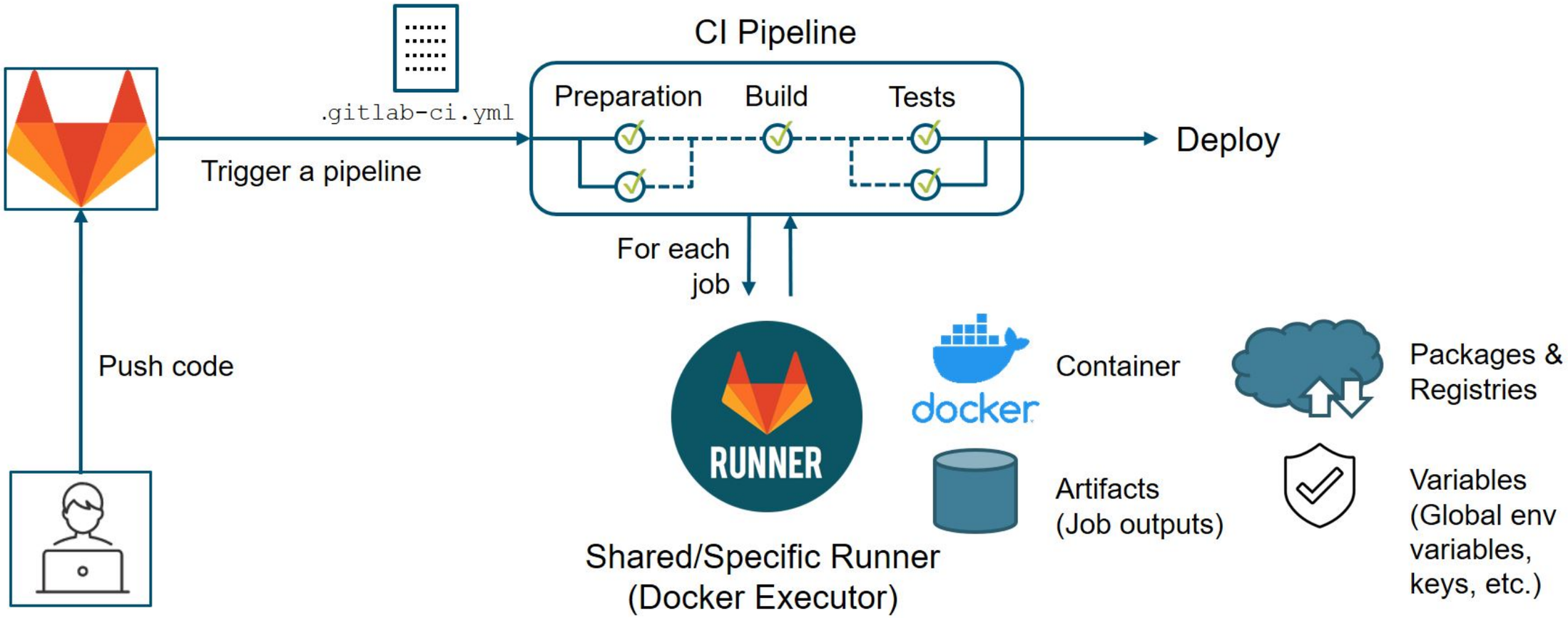
Zed Attack Proxy (ZAP)



https://www.zaproxy.org/

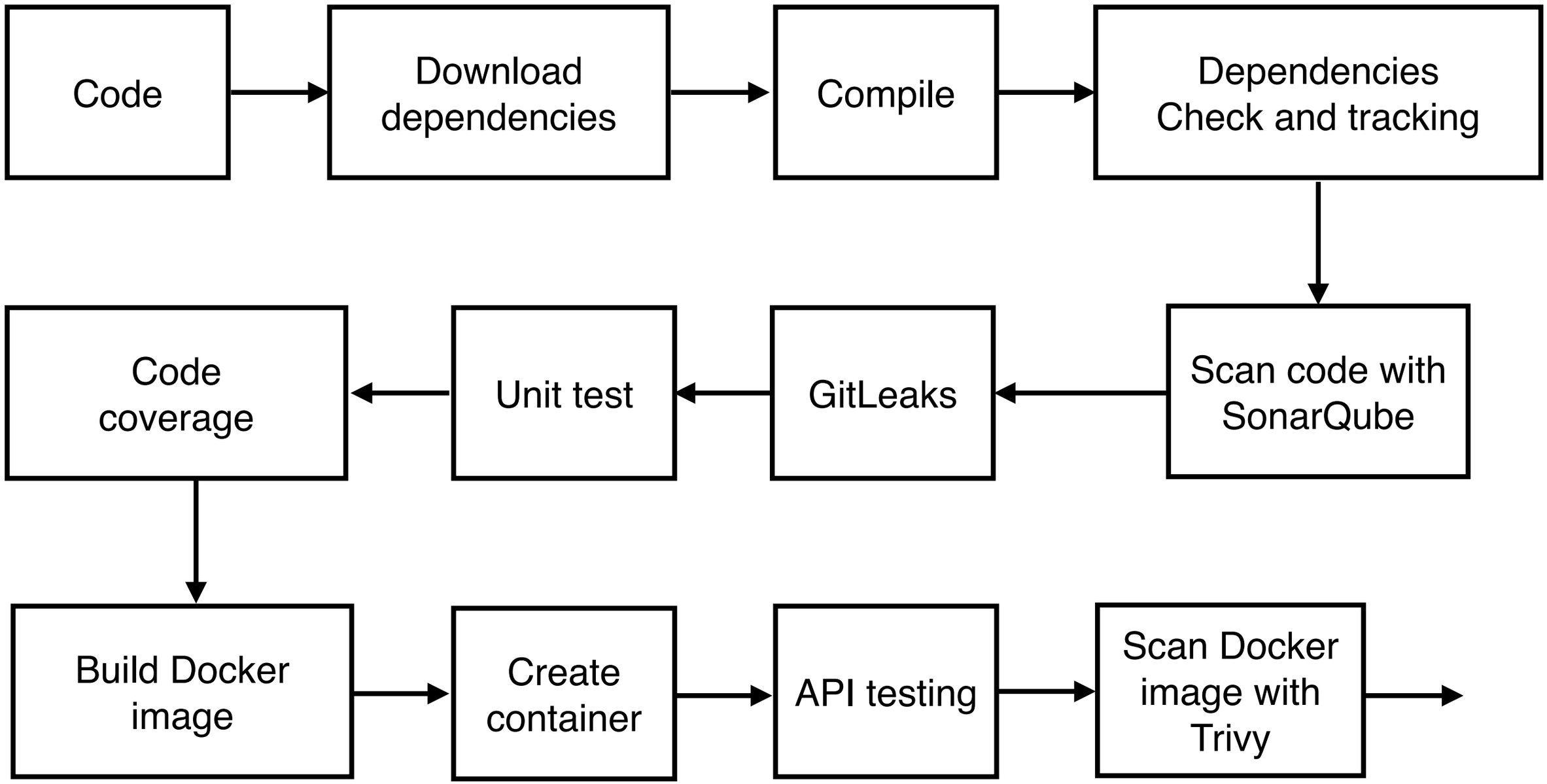
Workshop
CI/CD pipeline with GitLab

GitLab CI/CD



https://www.zaproxy.org/

Design your pipeline for API



https://www.zaproxy.org/

Create Repository in GitLab

Create blank project

Create a blank project to store your files, plan your work, and collaborate on code, among other things.

Project name

demo01

Must start with a lowercase or uppercase letter, digit, emoji, or underscore. Can also contain dots, pluses, dashes, or spaces.

Project URL

http://139.59.225.217:8929/ root /

Project slug

demo01

Visibility Level

- Private
  Project access must be granted explicitly to each user. If this project is part of a group, access is granted to members of the group.
- Internal
  The project can be accessed by any logged in user except external users.
- Public
  The project can be accessed without any authentication.

Project Configuration

- [ ] Initialize repository with a README
  Allows you to immediately clone this project's repository. Skip this if you plan to push up an existing repository.
- [x] Enable Static Application Security Testing (SAST)
  Analyze your source code for known security vulnerabilities. Learn more.
- [x] Enable Secret Detection
  Scan your code for secrets and credentials to prevent unauthorized access. Learn more.

Create project Cancel

Q/A