test markdown When $a \neq 0$, there are two solutions to $(ax^2 + bx + c = 0)$ and they are

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

// in controller something.controller.ts

// in model something.model.ts

// in schema something.schema.ts

// in service something.service.ts

// in utils maybe some file : something.utils.ts

// npx tsc –init

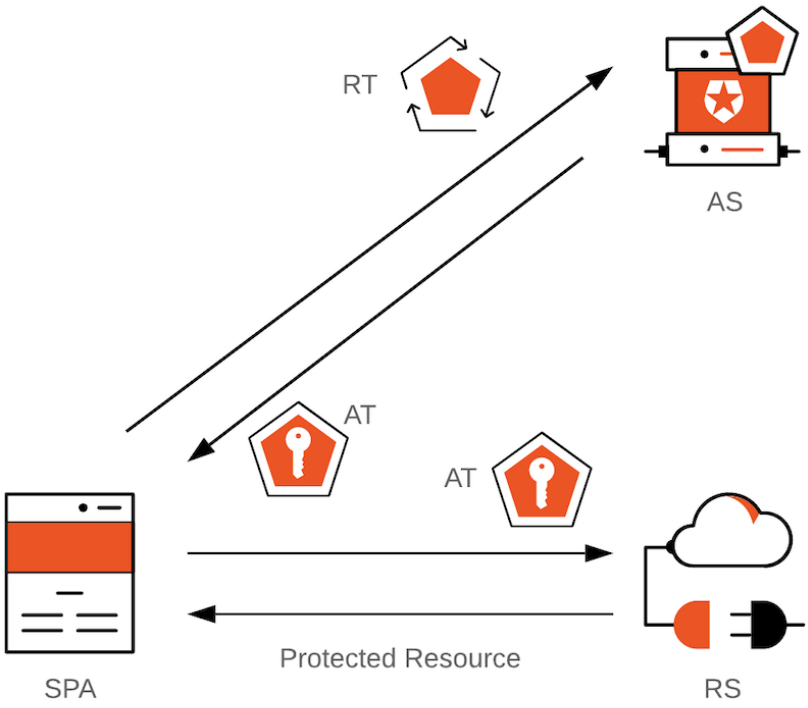
yarn add express zod config cors express mongoose pino pino-pretty dayjs bcrypt jsonwebtoken lodash nanoid

yarn add @types/body-parser @types/config @types/cors @types/express @types/node @types/pino @types/bcrypt @types/jsonwebtoken @types/lodash @types/nanoid ts-node-dev typescript -D

Authentocation adn Authorization

read: https://auth0.com/blog/refresh-tokens-what-are-they-and-when-to-use-them/ - Token are pieces of data that carry just enough information to facilitate the process of determining a user's identity or authorizing a user to perform an action

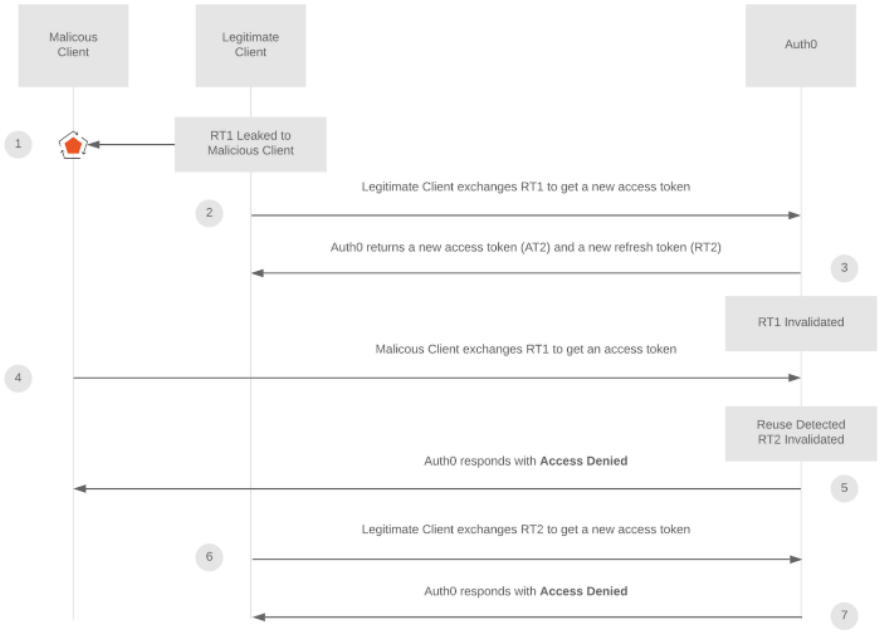
token example - id token : an artifact that client applications can use to consume the identity of a user. for ex: name, email, profile pict etc. - access token (bearer token) : The access token then acts as a credential artifact to access protected resources rather than an identification artifact. Malicious users could theoretically compromise a system and steal access tokens, which in turn they could use to access protected resources by presenting those tokens directly to the server. - refresh token : The client application can get a new access token as long as the refresh token is valid and unexpired.



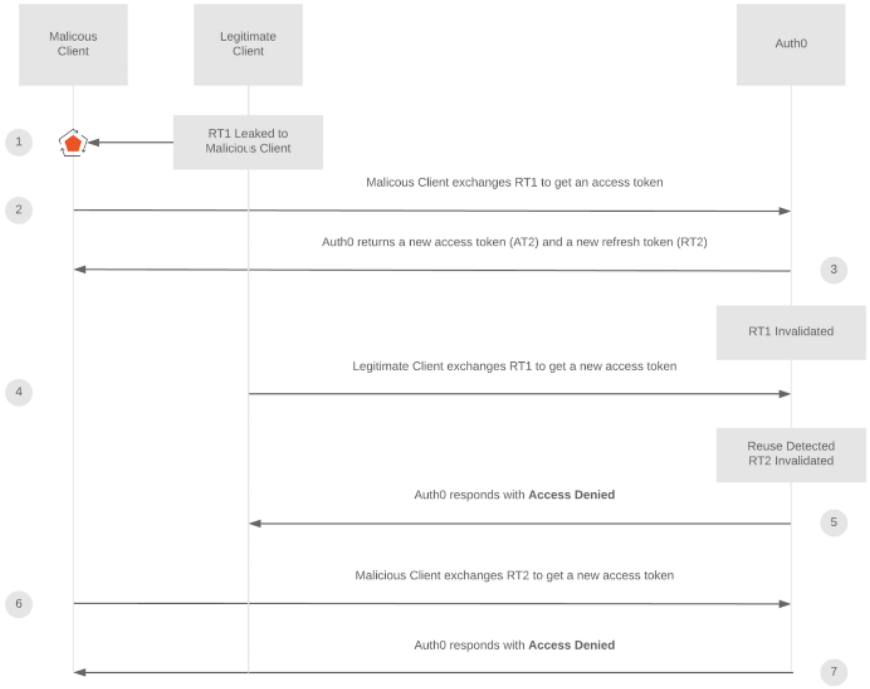
about access tokens and refresh tokens

links - https://blog.logrocket.com/persistent-login-in-react-using-refresh-token-rotation/ - https://auth0.com/docs/secure/tokens/refresh-tokens/refresh-token-rotation

refresh token reuse detection mechanism scenario 1



refresh token reuse detection mechanism scenario 2



USING CURL

cant use it on wsl2 yet

WARNING !

- always secure ur private key, cause if someone know ur private key, they can generate their own token ONLY ON SERVER SIDE
- public key doesnt need to keep secret :: PUBLIC

So all though 4096 bit, 2048 bit, 1024 bit, or even 512 bit looks really strong, but they are too slow to use in our case. Imagine you are using 2048 bit key as a secret for our JWT, which will be decoded every time a request is sent to maintain the user session.

A LITTLE BIT ABOUT JWT

sources: -https://jwt.io/introduction/

JSON Web Token (JWT) is an open standard (RFC 7519) that defines a compact and self-contained way for securely transmitting information between parties as a JSON object. This information can be verified and trusted because it is digitally signed. JWTs can be signed using a secret (with the HMAC algorithm) or a public/private key pair using RSA or ECDSA.

Here are some scenarios where JSON Web Tokens are useful:

- Authorization: This is the most common scenario for using JWT. Once the user is logged in, each subsequent request will include the JWT, allowing the user to access routes, services, and resources that are permitted with that token. Single Sign On is a feature that widely uses JWT nowadays, because of its small overhead and its ability to be easily used across different domains.
- Information Exchange: JSON Web Tokens are a good way of securely transmitting information between parties. Because JWTs can be signed—for example, using public/private key pairs—you can be sure the senders are who they say they are. Additionally, as the signature is calculated using the header and the payload, you can also verify that the content hasn't been tampered with.

JSON Web Token Structure

- Header The header typically consists of two parts: the type of the token, which is JWT, and the signing algorithm being used, such as HMAC SHA256 or RSA. ex: `{ "alg": "HS256", "typ": "JWT" }`
- Payload The second part of the token is the payload, which contains the claims. Claims are statements about an entity (typically, the user) and additional data. There are three types of claims: registered, public, and private claims.
  - Registered claims These are a set of predefined claims which are not mandatory but recommended, to provide a set of useful, interoperable claims. Some of them are: iss (issuer), exp (expiration time), sub (subject), aud (audience), and others.
  - Public claims These can be defined at will by those using JWTs. But to avoid collisions they should be defined in the IANA JSON Web Token Registry or be defined as a URI that c ontains a collision resistant namespace.
  - Private claims These are the custom claims created to share information between parties that agree on using them and are neither registered or public claims.

ex : ‘{

```
"sub": "1234567890",
"name": "John Doe",
```

`"admin": true`

}‘

The payload is then Base64Url encoded to form the second part of the JSON Web Token.

!!!!!!!!!

Do note that for signed tokens this information, though protected against tampering, is readable by anyone. Do not put secret information in the payload or header elements of a JWT unless it is encrypted.

- Signature The signature is used to verify the message wasn’t changed along the way, and, in the case of tokens signed with a private key, it can also verify that the sender of the JWT is who it says it is.