

Web3 and Angular: how to get out alive



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- Angular specialist
- Web3 enthusiast



My experience



Single page apps

Social apps

E-commerce apps

Enterprise web apps

Travel apps

CRM

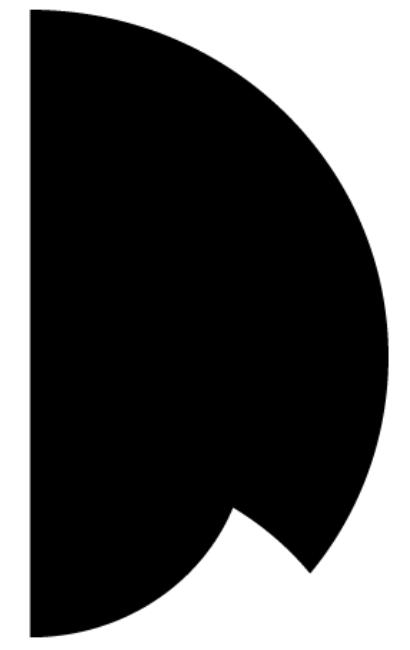
PWA

How I got into web3

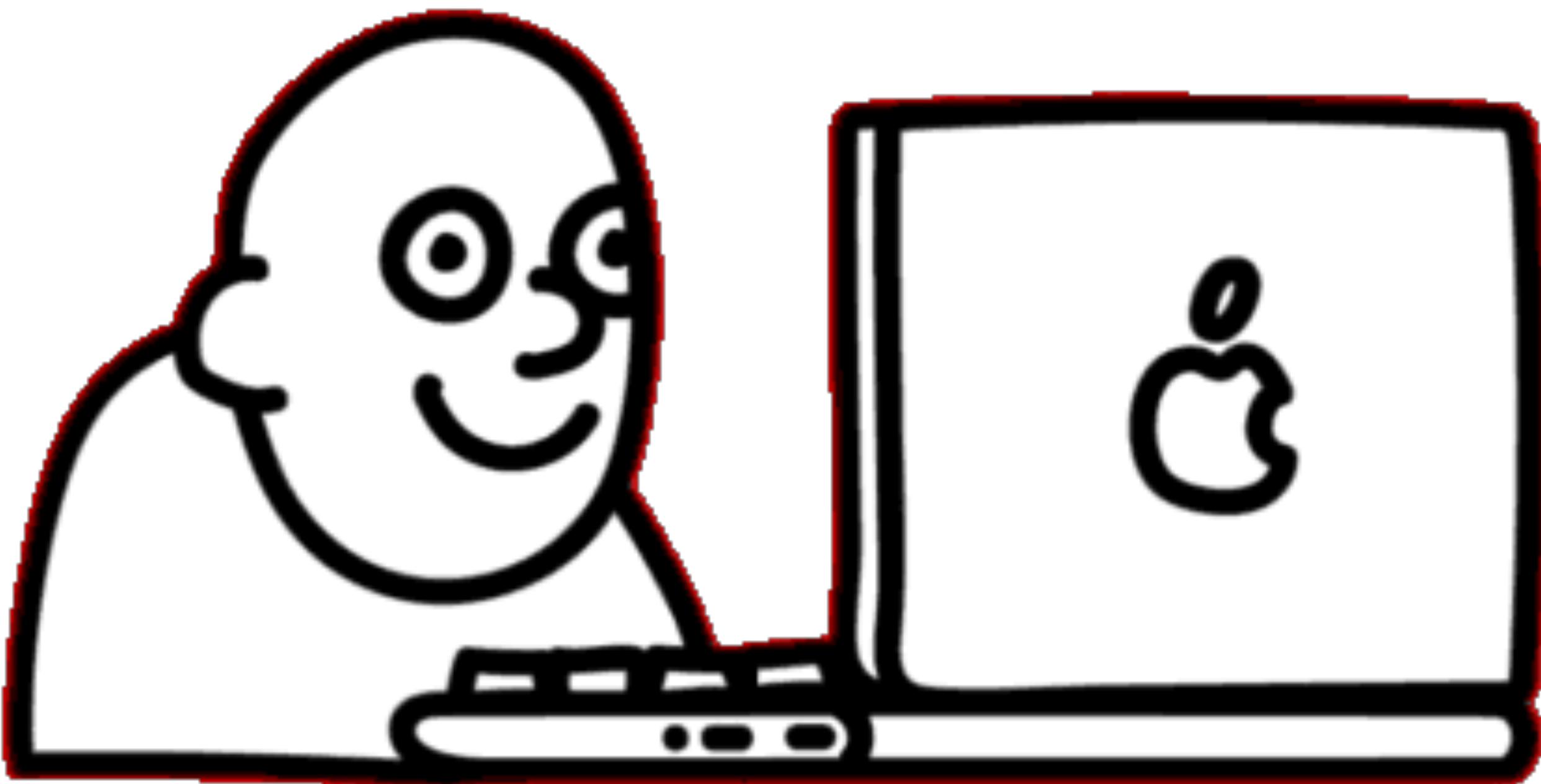
2021



SCALING ·
PARROTS



ME



WEB 3

What I wanted to do

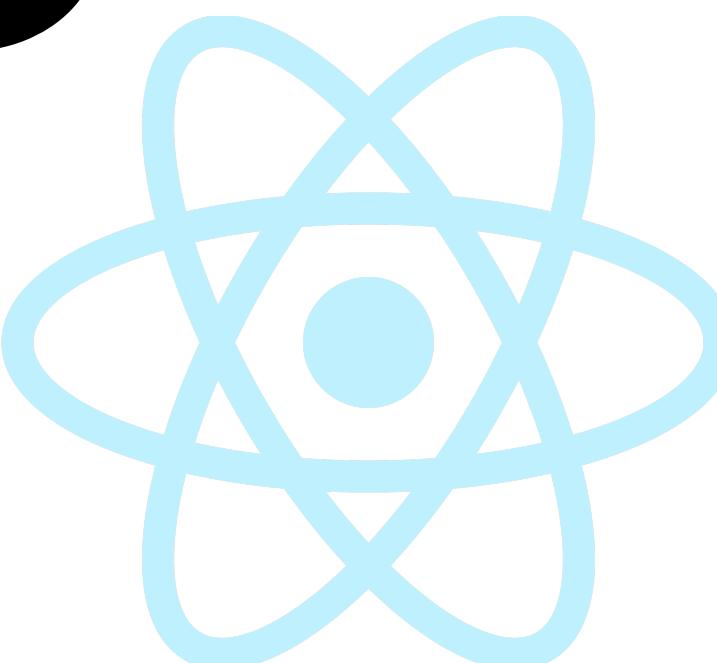
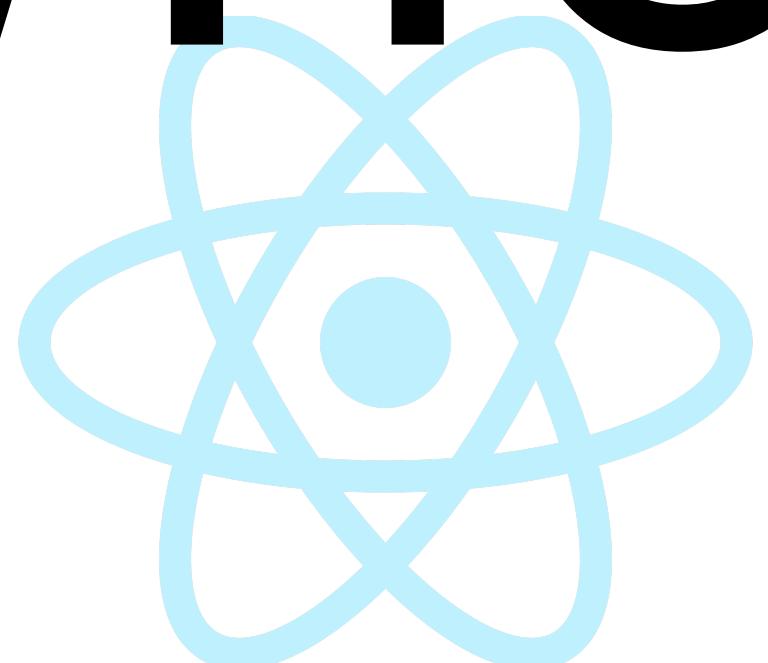
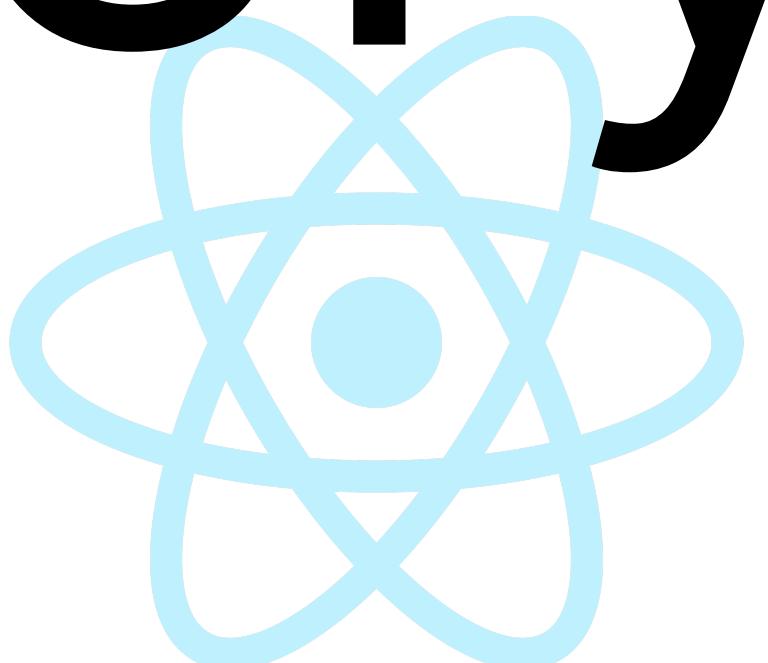
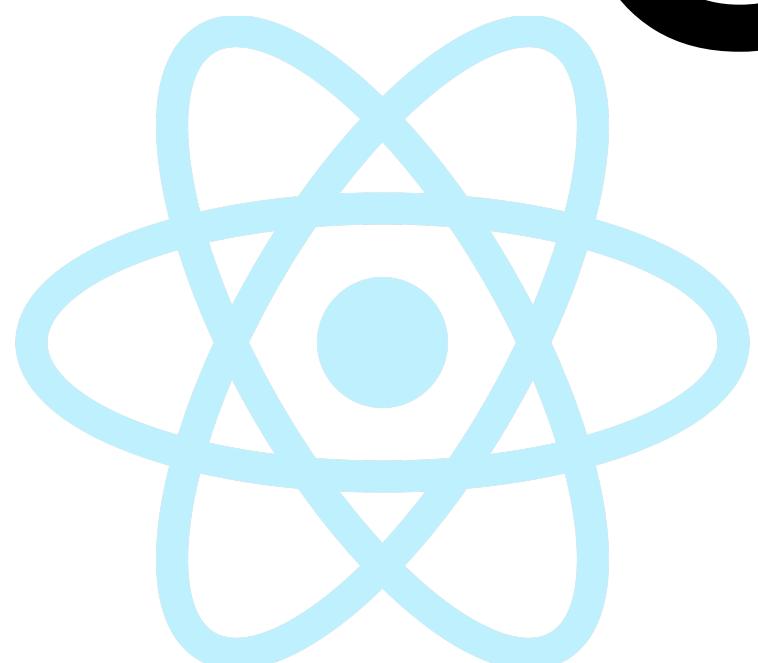
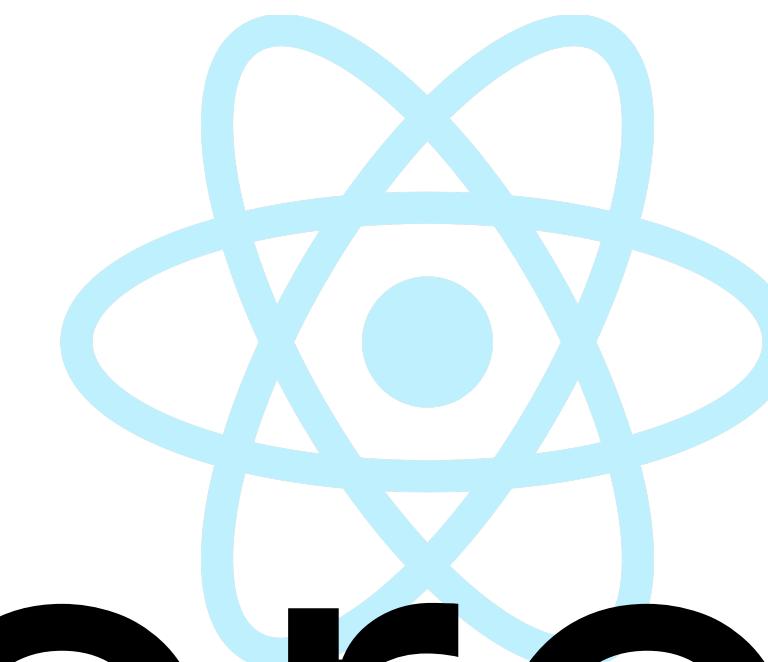
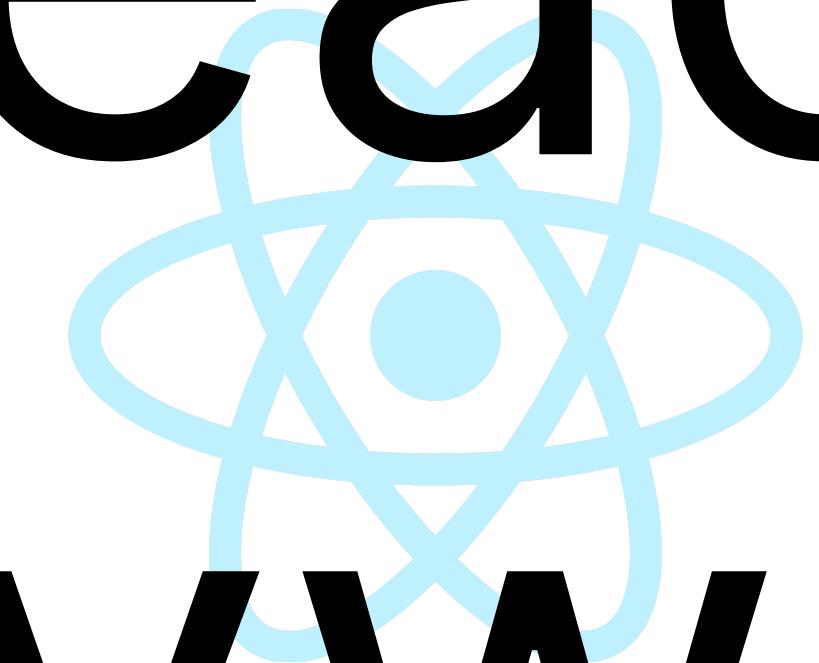
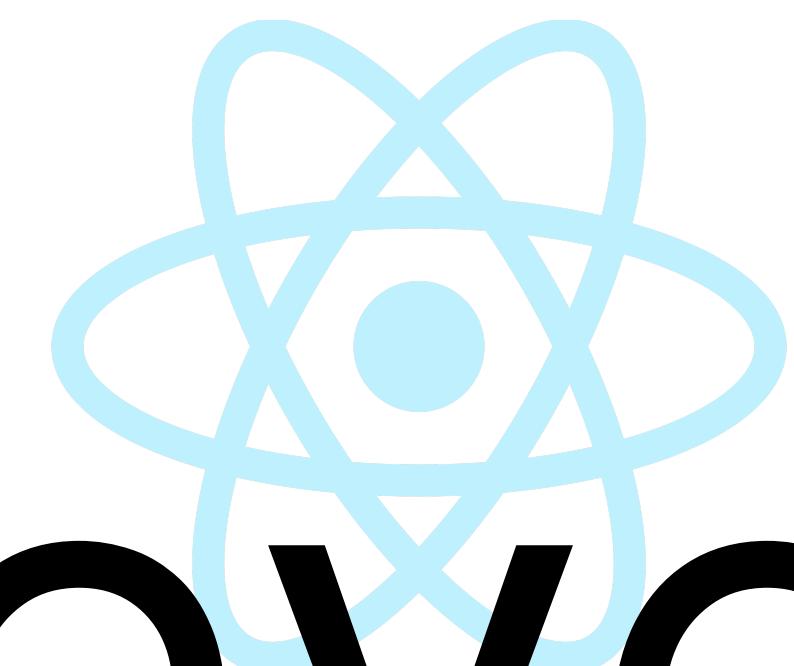
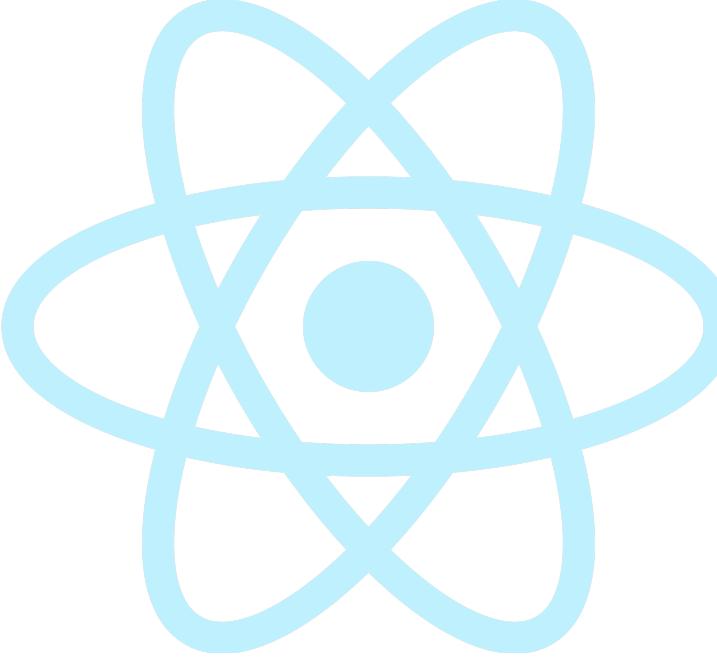
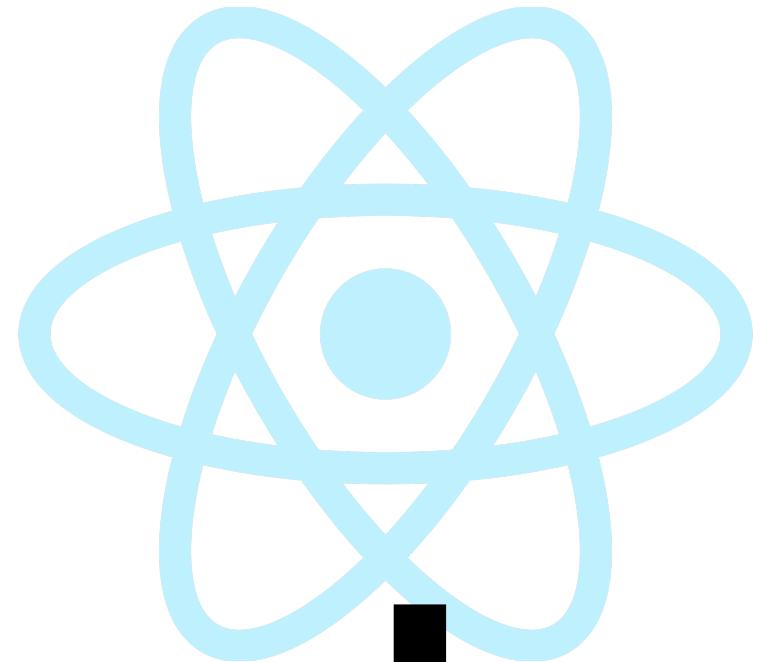
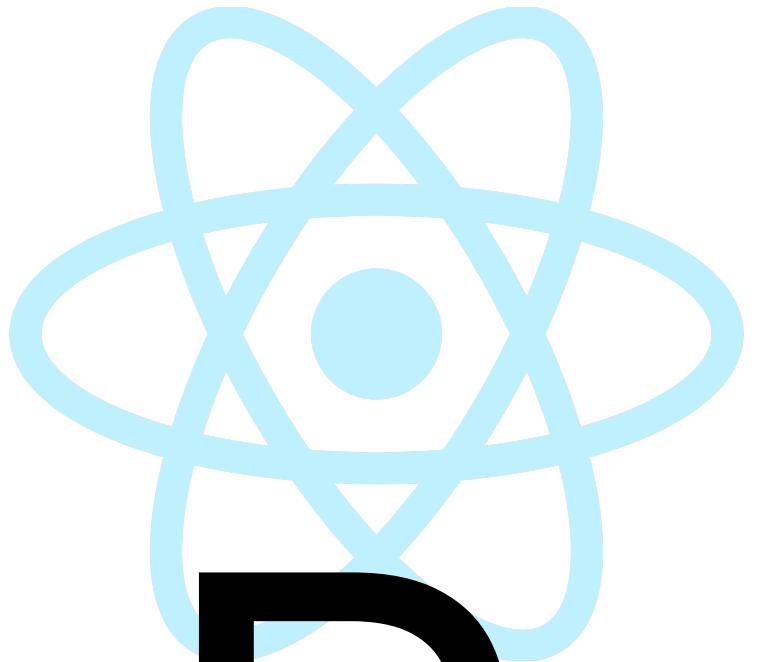
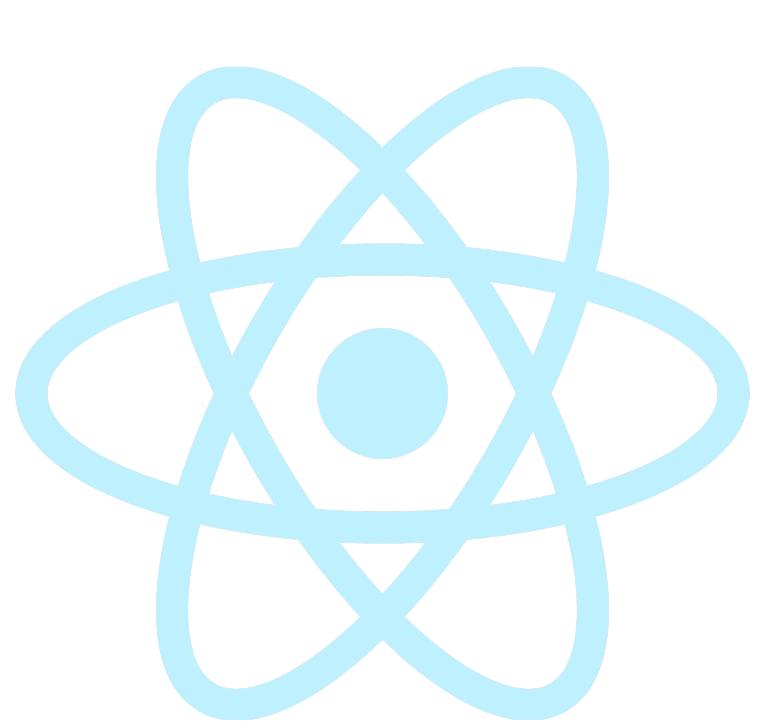


+

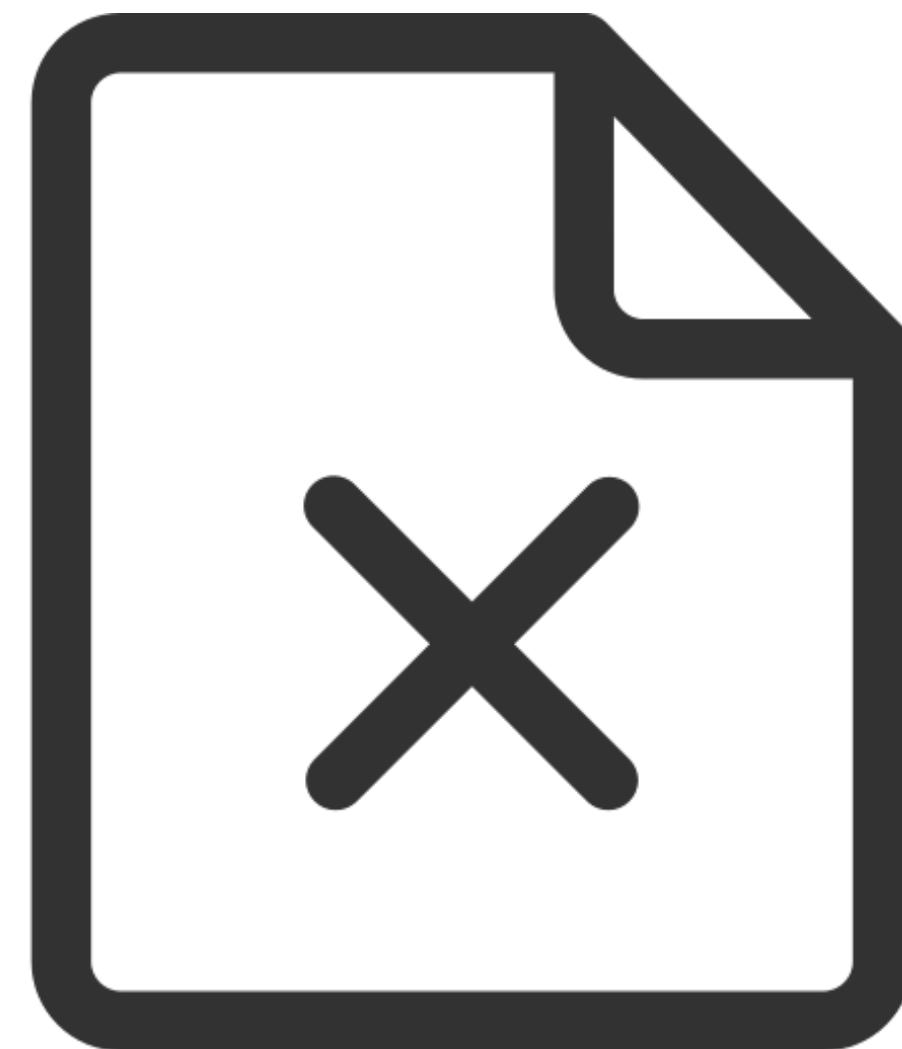


What I found

React
everywhere

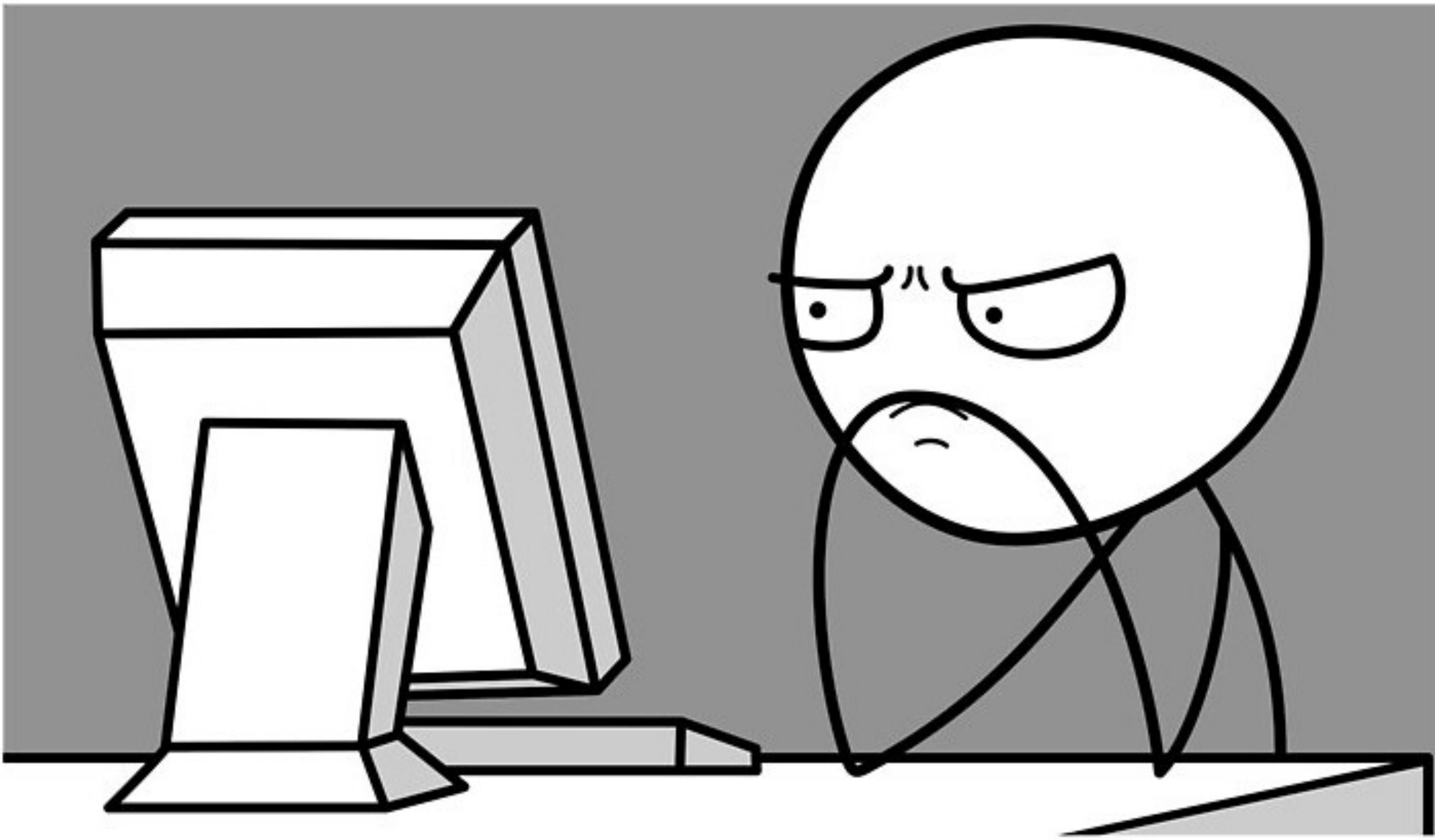


Lack of documentation



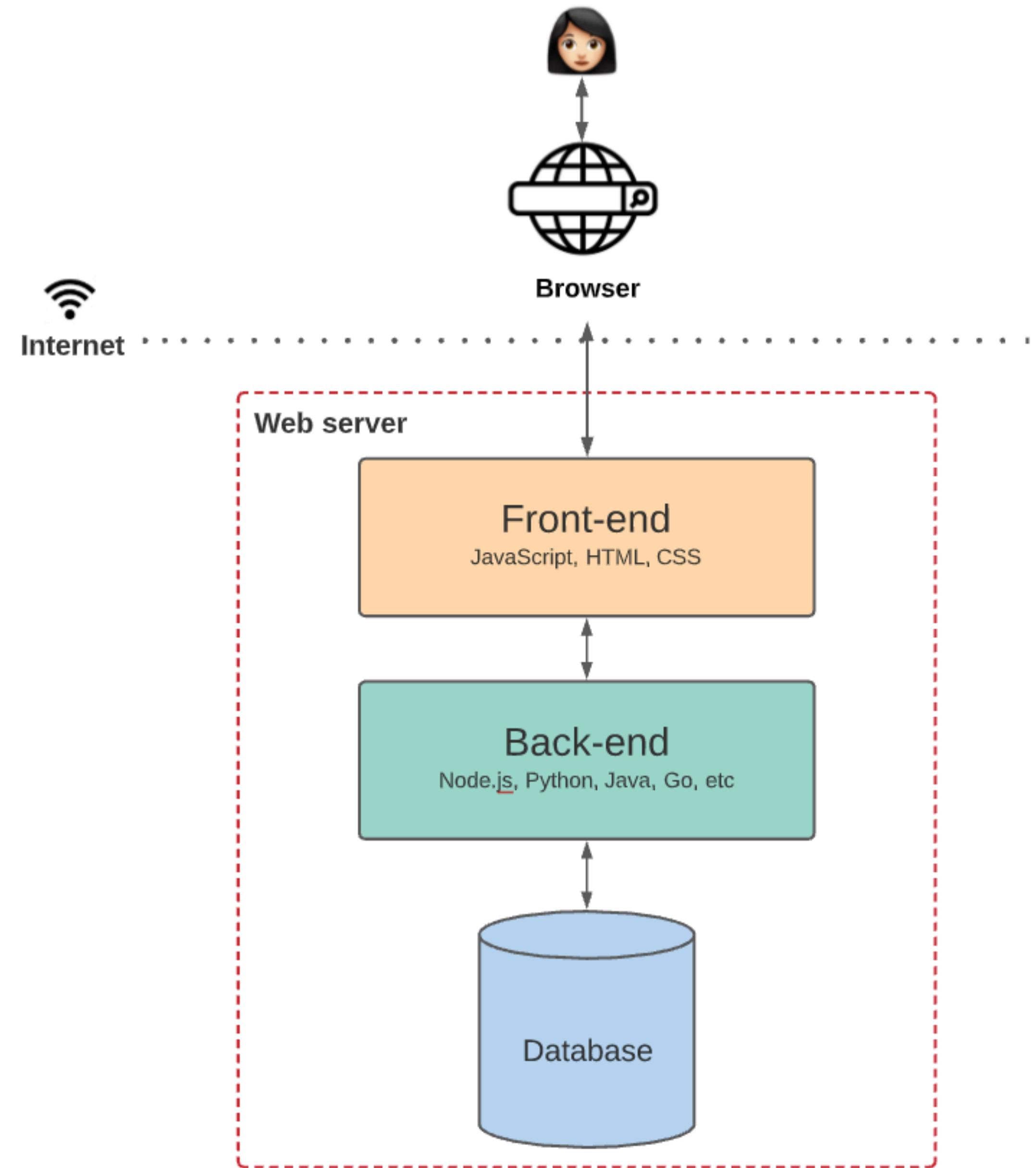
Not working libraries

```
BREAKING CHANGE: webpack < 5 used to include polyfills for node.js core modules by default.  
This is no longer the case. Verify if you need this module and configure a polyfill for it.  
  
If you want to include a polyfill, you need to:  
  - add a fallback 'resolve.fallback: { "assert": require.resolve("assert/") }'  
  - install 'assert'  
If you don't want to include a polyfill, you can use an empty module like this:  
  resolve.fallback: { "assert": false }  
  
.node_modules/xhr2-cookies/dist/xml-http-request.js:43:10-24 - Error: Module not found: Error: Can't res  
st'  
  
BREAKING CHANGE: webpack < 5 used to include polyfills for node.js core modules by default.  
This is no longer the case. Verify if you need this module and configure a polyfill for it.  
  
If you want to include a polyfill, you need to:  
  - add a fallback 'resolve.fallback: { "url": require.resolve("url/") }'  
  - install 'url'  
If you don't want to include a polyfill, you can use an empty module like this:  
  resolve.fallback: { "url": false }
```

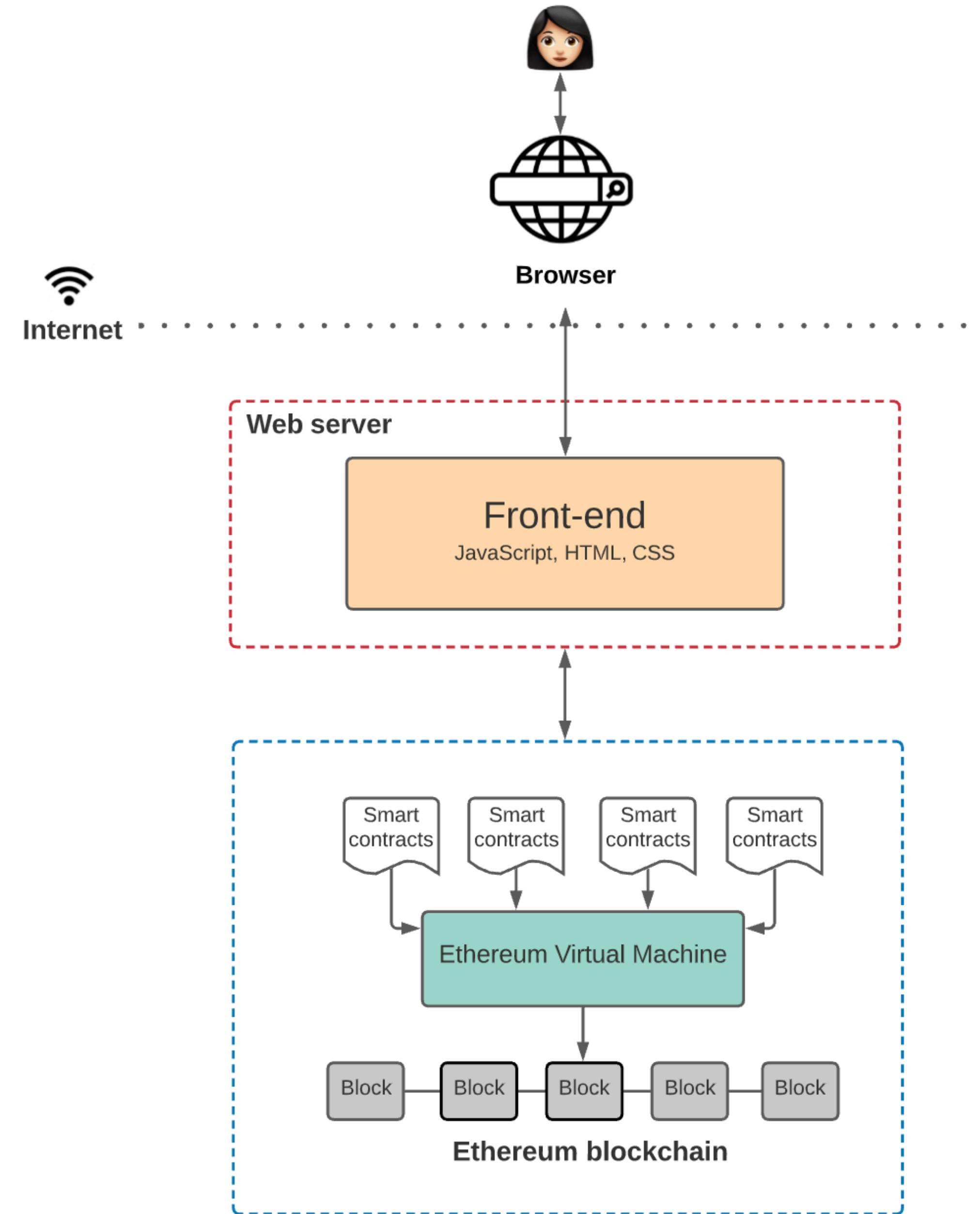


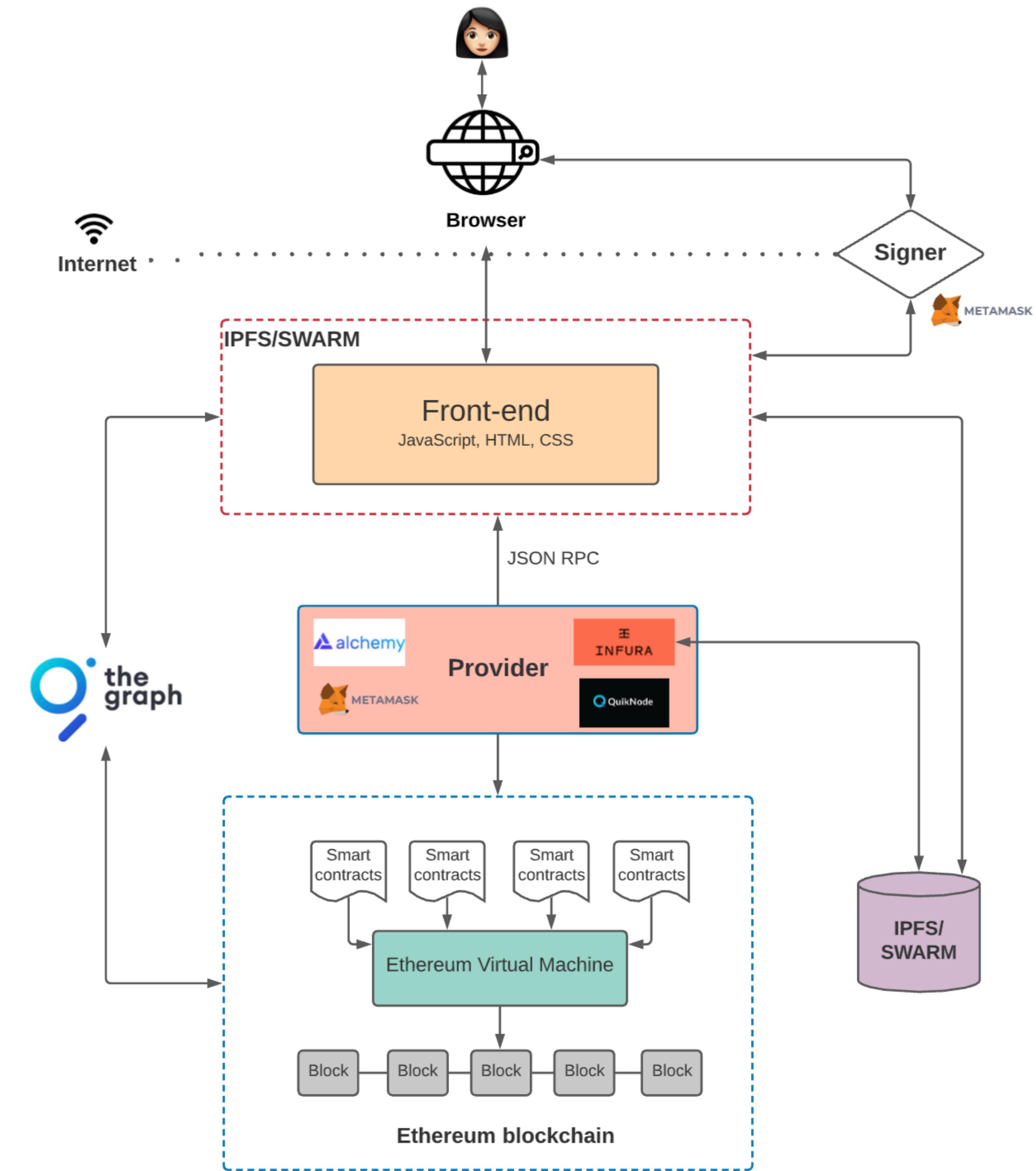
If it doesn't exist,
do it yourself

WEB2



WEB3

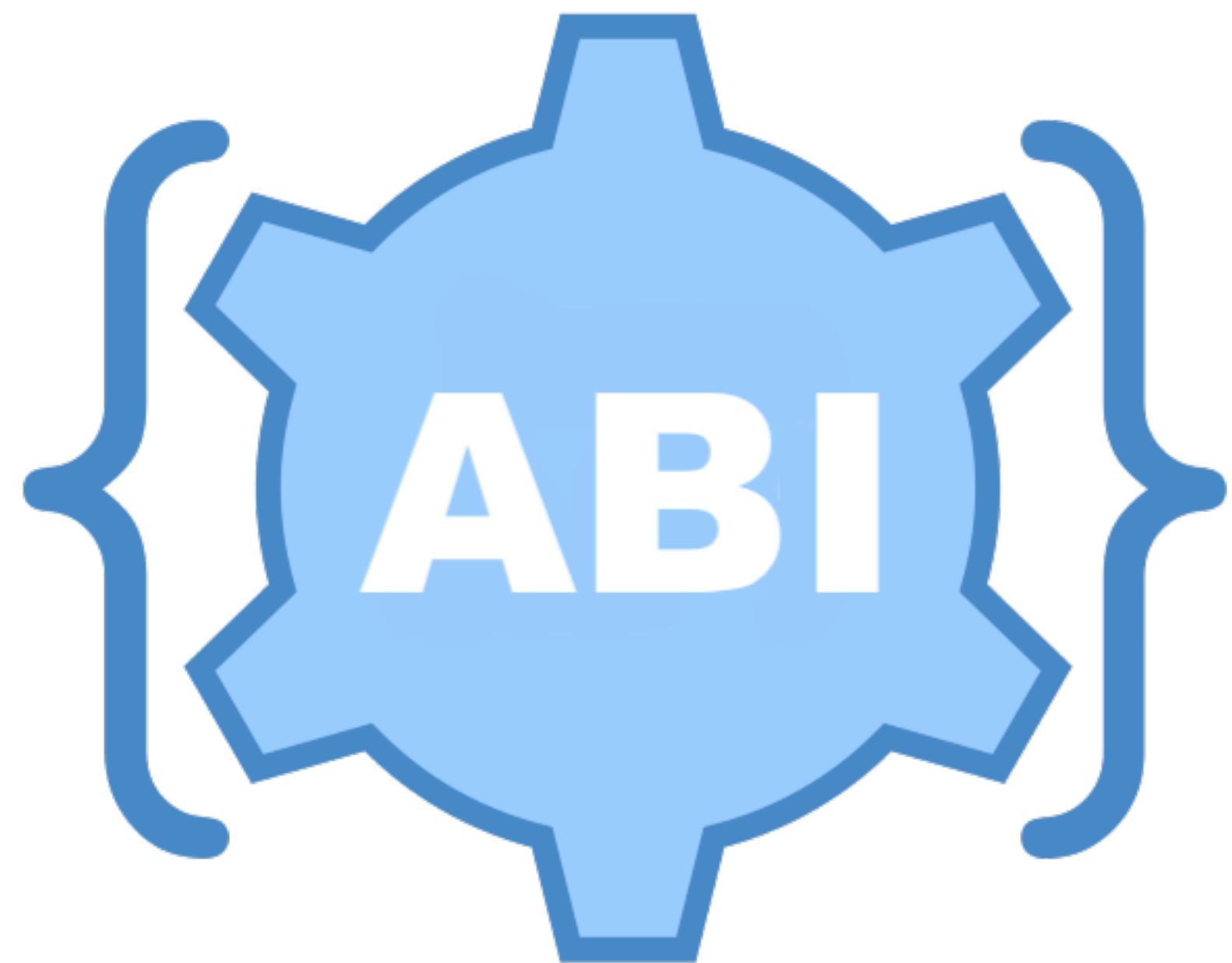




WEB2



WEB3



ABI

The Contract Application Binary Interface (ABI) is the standard way to interact with contracts in the Ethereum ecosystem, both from outside the blockchain and for contract-to-contract interaction

ABI

```
1 pragma solidity >=0.5.0;
2
3 contract Rent {
4     // define events notifying rent is paid
5     event RentPaid(
6         address indexed _from,
7         string indexed _tenant,
8         uint _rent
9     );
10
11 function deposit(string memory _tenant) public payable {
12     //emit event notifying rent is paid
13     emit RentPaid(msg.sender, _tenant, msg.value);
14 }
15 }
```

```
"abi": [
{
    "constant": false,
    "inputs": [
        {
            "name": "_tenant",
            "type": "string"
        }
    ],
    "name": "deposit",
    "outputs": [],
    "payable": true,
    "stateMutability": "payable",
    "type": "function"
},
{
    "anonymous": false,
    "inputs": [
        {
            "indexed": true,
            "name": "_from",
            "type": "address"
        },
        {
            "indexed": true,
            "name": "_tenant",
            "type": "string"
        },
        {
            "indexed": false,
            "name": "_rent",
            "type": "uint256"
        }
    ],
    "name": "RentPaid",
    "type": "event"
}]
```

WEB2

Swagger on ASP.NET Core 1.0.0 OAS3

</swagger/CoreSwagger/swagger.json>

VBT Web Api

[Terms of service](#)

[Authorize](#) 

Abone

^

<small>GET</small>	/api/Abone	<small>▼</small> 
<small>POST</small>	/api/Abone	<small>▼</small> 
<small>GET</small>	/api/Abone/GetAboneByRawSql	<small>▼</small> 
<small>GET</small>	/api/Abone/GetView	<small>▼</small> 
<small>PUT</small>	/api/Abone/{id}	<small>▼</small> 
<small>DELETE</small>	/api/Abone/{id}	<small>▼</small> 

WEB3

Etherscan

Rinkeby Testnet Network

All Filters ▾ Search by Address / Txn Hash / Block / Token / Ens 🔍

Home Blockchain ▾ Tokens ▾ Misc ▾ Rinkeby

Contract 0xBc84F3bf7Dd607a37F9e5848a6333e6c188d926c 🔗 🕒 b²

Contract Overview

Balance: 0 Ether

More Info

My Name Tag: Not Available

Contract Creator: 0xc31eb6e317054a79bb... at txn [0x66c6c946e53be3f544...](#)

Token Tracker: FundRequest (FND)

Transactions Internal Txns Erc20 Token Txns Contract ✓ Events

Code Read Contract Write Contract

📄 [Read Contract Information](#) [Expand all] [Reset]

1. name 🔗 ➡

2. creationBlock 🔗 ➡

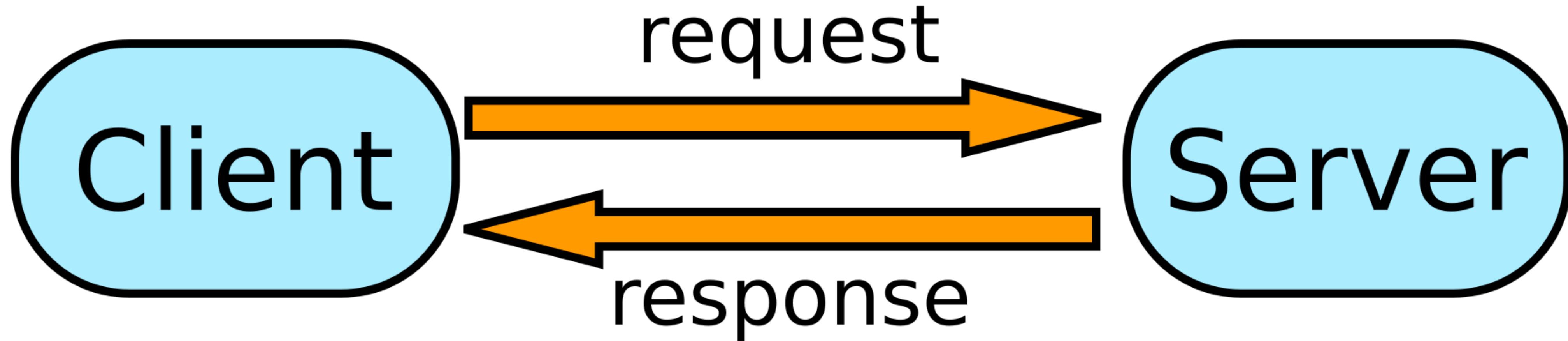
3. totalSupply 🔗 ➡

4. decimals 🔗 ➡

5. balanceOfAt 🔗 ➡

6. version 🔗 ➡

WEB2



WEB3



e t h e r s . j s

Operations in web3

- Wallet interaction
- Read from smart contract
- Write in smart contract

Wallet

- Provider
- Wallet address
- Network

Wallet



METAMASK



BINANCE
SMART CHAIN



WalletConnect

Wallet - provider

```
const metaMaskExtProvider = this.win.ethereum;  
  
const binanceExtProvider = this.win.BinanceChain;  
  
const walletConnectProvider = new WalletConnectProvider({  
    infuraId: this.infuraId,  
    rpc: this.requiredNetwork.rpc  
});
```

Wallet - connect

```
if (type === "walletConnect") {  
  
    web3provider = new ethers.providers.Web3Provider(walletConnectProvider);  
  
} else if (type === "metamask") {  
  
    web3provider = new ethers.providers.Web3Provider(metaMaskExtProvider);  
  
} else if (type === "binance") {  
  
    web3provider = new ethers.providers.Web3Provider(binanceExtProvider);  
  
}
```

```
▼ Web3Provider {_isProvider: true, _events: Array(0), _emitted: {...}, disableCcipRead: false, formatter: Formatter, ...} ⓘ
  anyNetwork: false
  ► connection: {url: 'metamask'}
  disableCcipRead: false
  ► formatter: Formatter {formats: ...}
  ► jsonRpcFetchFunc: f (method, params)
  ► provider: Proxy {_events: {...}, _eventsCount: 0, _maxListeners: 100, _log: u, _state: {...}, ...}
  ► _emitted: {block: -2}
  ► _eventLoopCache: {detectNetwork: null}
  ► _events: []
  _fastQueryDate: 0
  _isProvider: true
  _lastBlockNumber: -2
  _maxFilterBlockRange: 10
  _maxInternalBlockNumber: -1024
  ► _network: {name: 'bnb', chainId: 56, ensAddress: null, _defaultProvider: null}
  ► _networkPromise: ZoneAwarePromise {__zone_symbol__state: true, __zone_symbol__value: ...}
  _nextId: 42
  _pollingInterval: 4000
  blockNumber: (...)

  network: (...)

  polling: (...)

  pollingInterval: (...)

  ready: (...)

  _cache: (...)

  ► [[Prototype]]: JsonRpcProvider
```

Wallet - address

```
if (type === "walletConnect") {  
  
    addresses = await web3provider.enable();  
  
} else if (type === "metamask") {  
  
    addresses = await web3provider.send("eth_requestAccounts", []);  
  
} else if (type === "binance") {  
  
    addresses = await web3provider.enable();  
  
}
```

```
▼ [ '0x2060266ba136dc0b2f4d5cebd147209f0954c756' ] ⓘ  
  0: "0x2060266ba136dc0b2f4d5cebd147209f0954c756"  
  length: 1  
► [[Prototype]]: Array(0)
```

Wallet - network

```
network = await web3provider.getNetwork();
```

```
▼ {name: 'bnb', chainId: 56, ensAddress: null, _defaultProvider: null} ⓘ  
  chainId: 56  
  ensAddress: null  
  name: "bnb"  
  _defaultProvider: null  
► [[Prototype]]: Object
```

Smart contract interaction

Read

```
import { ethers, providers } from "ethers";

readContract(
  contractAddress: string,
  rpcProvider: string,
  abi: any,
  methodName: string,
  args?: any[]
): Promise<any> {
  const provider = new providers.JsonRpcProvider(rpcProvider);

  const contractManager = new ethers.Contract(
    contractAddress,
    abi,
    provider
  );

  if (args?.length) {
    return contractManager[methodName](...args);
  } else {
    return contractManager[methodName]();
  }
}
```

Read example

```
// read BUSD balance on BNB Chain
async getBalance(account: string) {
  try {
    const balance = await this.readContract(
      '0xe9e7CEA3DedcA5984780Bafc599bD69ADD087D56',
      'https://bsc-dataseed.binance.org',
      ERC20abi,
      'balanceOf',
      [account]
    );

    console.log('Balance in BigNumber: ', balance);
    console.log('Balance as number: ', Number(balance));
  } catch (error: any) {
    console.log(error.message);
  }
}
```

Read example ABI

```
        },
        {
            "constant": true,
            "inputs": [
                {
                    "name": "_owner",
                    "type": "address"
                }
            ],
            "name": "balanceOf",
            "outputs": [
                {
                    "name": "balance",
                    "type": "uint256"
                }
            ],
            "payable": false,
            "stateMutability": "view",
            "type": "function"
        },
        {
            ...
        }
```

Read logs

```
Balance in BigNumber: ► BigNumber {_hex: '0x056ce503487ecea7', _isBigNumber: true}  
Balance as number: 390939069938323140
```

BscScan

4. allowance

5. balanceOf

account (address)

0x2060266bA136DC0b2f4D5Cebd147209F0954C756

Query

↳ uint256

[balanceOf method Response]

» uint256 : 390939069938323111

6. decimals

Write

```
writeContract(  
    contractAddress: string,  
    abi: any,  
    methodName: string,  
    args?: any[]  
): Promise<any> {  
  
    const contract = new ethers.Contract(  
        contractAddress,  
        abi,  
        provider // wallet provider  
    );  
  
    if (args?.length) {  
        return contract[methodName](...args);  
    } else {  
        return contract[methodName]();  
    }  
}
```

Write example

```
// example of write contract
async approve(spender: string, amount: number) {
  const decimals = 18;
  const amountBignumber = BigNumber.from(amount).mul(BigNumber.from(10).pow(decimals));

  try {
    const tx = await this.writeContract(
      '0xe9e7CEA3DedcA5984780Bafc599bD69ADD087D56',
      ERC20abi,
      'approve',
      [spender, amountBignumber]
    );

    console.log('Success ', tx);
  } catch (error: any) {
    console.log(error.message);
  }
}
```

Write example ABI

```
},
{
  "constant": false,
  "inputs": [
    {
      "name": "_spender",
      "type": "address"
    },
    {
      "name": "_value",
      "type": "uint256"
    }
  ],
  "name": "approve",
  "outputs": [
    {
      "name": "",
      "type": "bool"
    }
  ],
  "payable": false,
  "stateMutability": "nonpayable",
  "type": "function"
},
```

Give permission to access
your BUSD?

By granting permission, you are allowing the following account to access your funds



Edit permission

Transaction fee

Edit

A fee is associated with this request.

\$0.07

0.00022 BNB

Hide full transaction details ▲

Permission request

Edit

<http://localhost:64818> may access and spend up to this max amount

Approved amount: 10 BUSD

Granted to: 0x2060266b - C756

Data

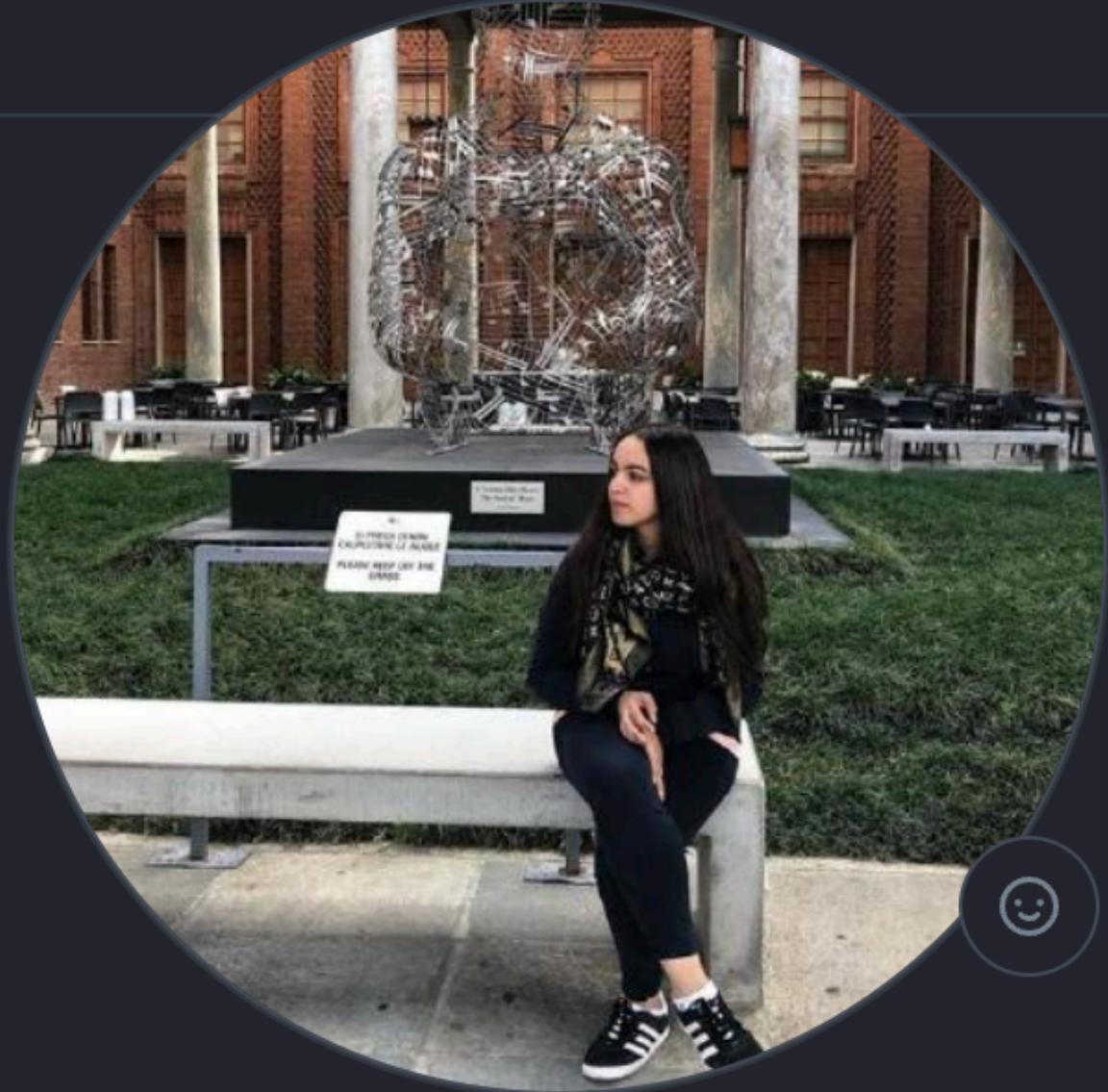
Function: Approve

Reject

Confirm



Demo



Soumaya Erradi
soumayaerradi

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[REDACTED]-dapp Private

Forked from scalingparrots/angular-dapp-template

JavaScript 1 Updated on Jul 18

Star ▾

dapp-library Private

TypeScript Updated on Jul 11

Star ▾

Thank you!

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