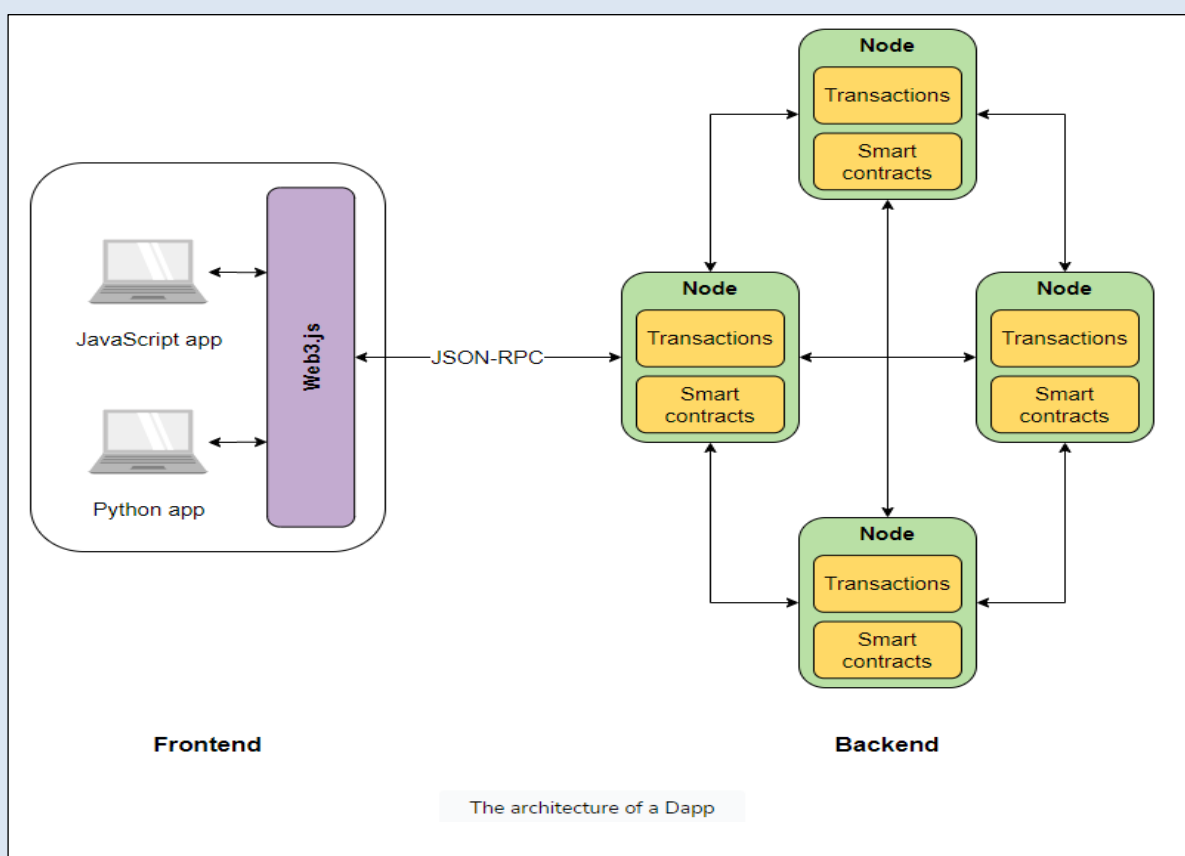


## Web3.js : Interact with a local Ethereum blockchain

Web3.js is an open-source library of JavaScript built by the Ethereum foundationis that allow developers to interact with a remote or local Ethereum node using HTTP, IPC, or WebSocket.

The web3.js library is integral to **decentralized apps (Dapps)** as it helps connect the backend to the frontend. It provides functions that allow the frontend to communicate with an Ethereum node via the JavaScript Object Notation-Remote Procedure Call (JSON-RPC) protocol.

Web3 allows you to perform actions like retrieve user accounts, send Ether from one account to another, send transactions, interact with smart contracts, read and write data from smart contracts, and more.



In this lab we will use web3 to interact with the local ethereum Ganache blockchain (How to send a transaction).

The Lab environment (Three components) :

Node.js (Cross-platform JavaScript runtime environment)

Web3.js

Ganache

For text editor we recommend **Visual Studio Code**

- Download and install the Latest Current Version of Node.js (includes npm)

For windows : Windows Installer (.msi) 64-bit

<https://nodejs.org/en/download/current>

Test the installation using :

```
>node -v
```

```
>npm -v
```

- Create a working directory and install the web3 library in it :  
( Optional : Issue `>npm init` to create the package.json file that contains the library installed in the current project)

```
>npm install --save web3
```

Notice that web3 line is added to package.json file

```
>node
```

```
>const { Web3 } = require('web3');
```

```
>const web3 = new Web3('http://127.0.0.1:7545');
```

```
>Web3
```

Get the list of the ten ganach accounts

```
web3.eth.getAccounts().then(console.log);
```

Get gas price

```
Web3.eth.getGasPrice().then(console.log);
```

Create new account

```
web3.eth.accounts.create();
```

Get balance of an account

```
await web3.eth.getBalance('0xdd75478ffFeC6EdfA29d7ae38e38fa192FFFaB07');
```

or

```
web3.eth.getBalance('0xdd75478ffFeC6EdfA29d7ae38e38fa192FFFaB07').then(console.log);
```

Convert from wei to another unit (1 Ether =  $10^{18}$  Wei)

```
web3.utils.fromWei(count_to_convert, unit_to_convert_to)
```

```
web3.utils.fromWei('20000000000', 'ether');
```

Transfert ether from an account to another

```
web3.eth.sendTransaction({to:'0x4bec925613AF22cC98886f6EbcB68BcB0B5f02F1',from:
```