



Universidad de Oviedo



School of
Computer
Science

EN
English



SOFTWARE
ARCHITECTURE

Software Architecture

Lab. 03

React

Solid

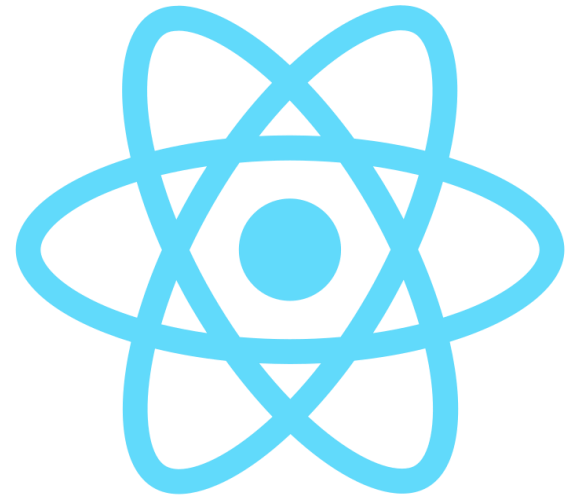
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What is React.js?

React is a JavaScript library for building user interfaces for the web as well as mobile applications

- Open source
- Created by Facebook
- Based on components



Why React?

Some reasons to use React:

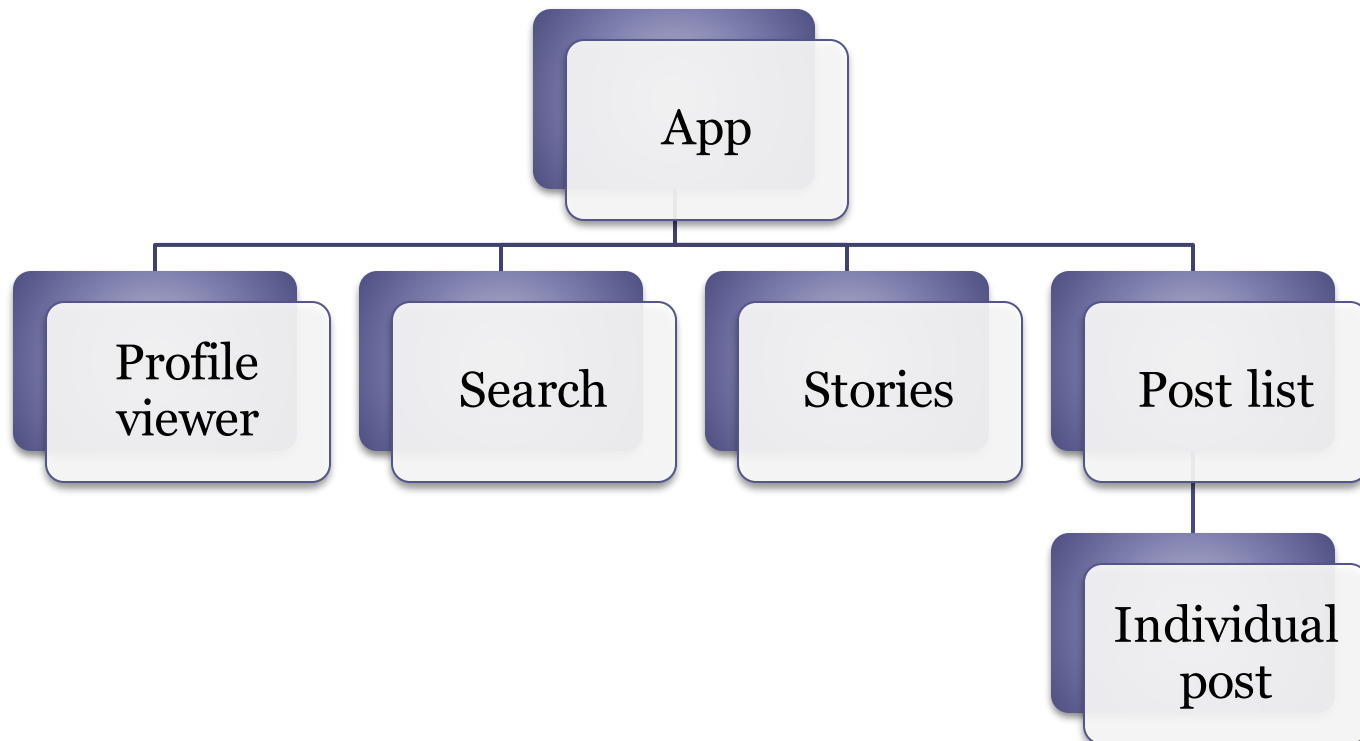
- Simplicity and easy to learn
- Reusable components
- Native approach (React Native)
- Lots of resources and tools for development
- Testability

Components

Pages are modelled using components

A component is a part of the user interface

Example: Instagram



Components

A component can be implemented as a JavaScript class

- It has a state
- And a render method that controls what is displayed in UI
- When the state changes, react updates the element and its child's in memory
- This element representation in memory is called Virtual DOM

```
class ProfileViewer{  
  state = {}  
  render(){  
  }  
}
```

**React reacts
to changes**

JSX

JSX is a syntax extension to Javascript

Looks like HTML

JSX files are compiled to Javascript

JSX

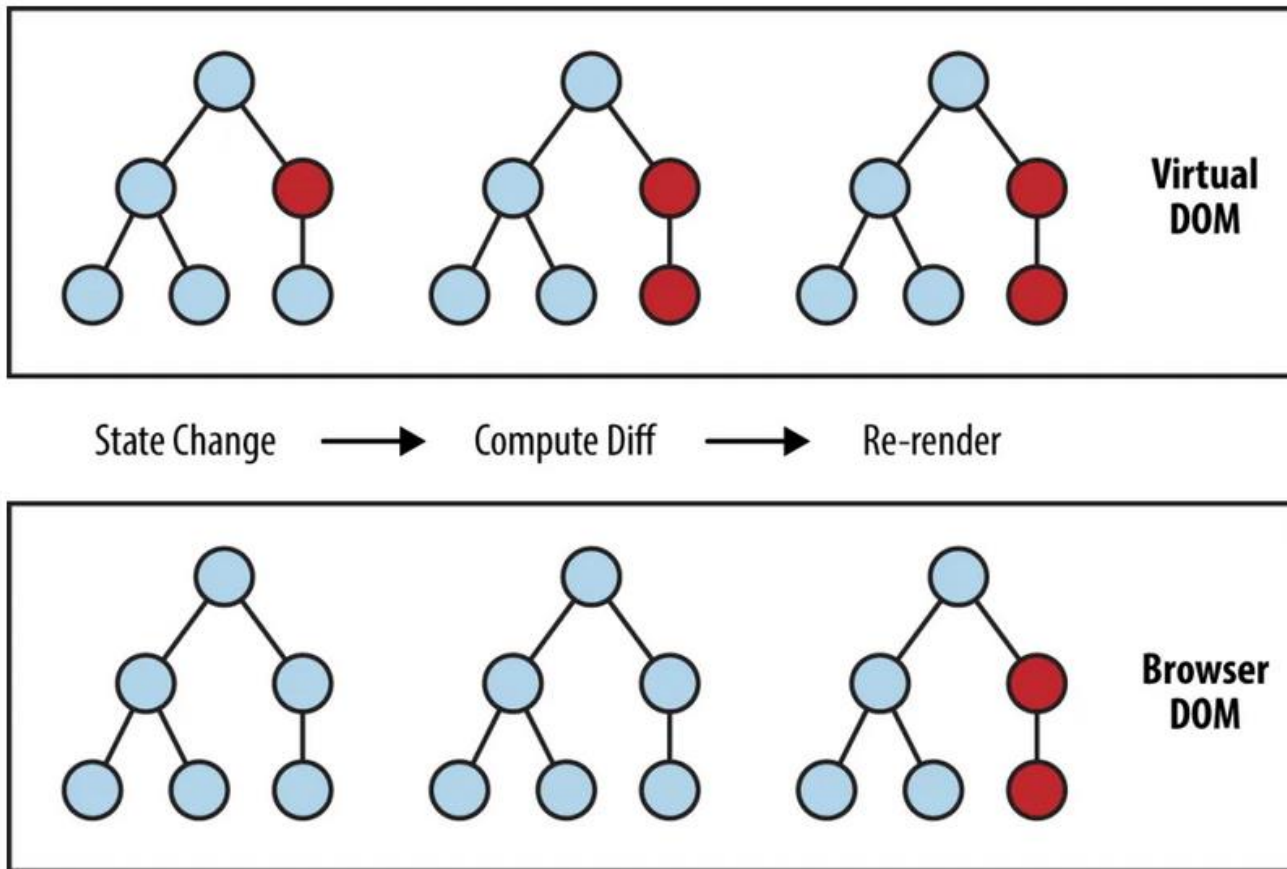
```
const element = (  
  <h1 className="greeting">  
    Hello, world!  
  </h1>  
);
```



Javascript

```
const element = React.createElement(  
  'h1',  
  {className: 'greeting'},  
  'Hello, world!'  
);
```

Virtual DOM



source: <https://www.oreilly.com/library/view/learning-react-native/9781491929049/ch02.html>

We also have Hooks

They replace classes by functions

- In the following example, we use the `useState` hook to handle the name changes in the app
- Once the button is clicked, the state is changed, the virtual DOM updated, and the page is automatically refreshed

```
const App = () => {  
  const [name, setName] = useState('World');  
  return (  
    <div className="App">  
      <h1>Hello, {name}!</h1>  
      <button onClick={() => setName('James')}>  
        Click me to change the name  
      </button>  
    </div>  
  );  
};
```


Typescript with React



Adds optional **static typing** to Javascript

```
type UserListProps = {
  users: User[];
}
```



```
export type User = {
  name:string;
  email:string;
}
```

```
function UserList(props: UserListProps): JSX.Element {
  return (
    <>
      <List>
        {props.users.map((user,i)=>{
          return (
            <ListItem key={user.email}>
              <ListItemIcon><ContactPageIcon/></ListItemIcon>
              <ListItemText primary={user.name} secondary={user.email}/>
            </ListItem>
          )
        })}
      </List>
    </>
  );
}
```

This component will render an array of Users that will receive as a component property. Check the full example in **your repository!**

SOLID

Is a technology for organizing apps, information and identities in a decentralized way

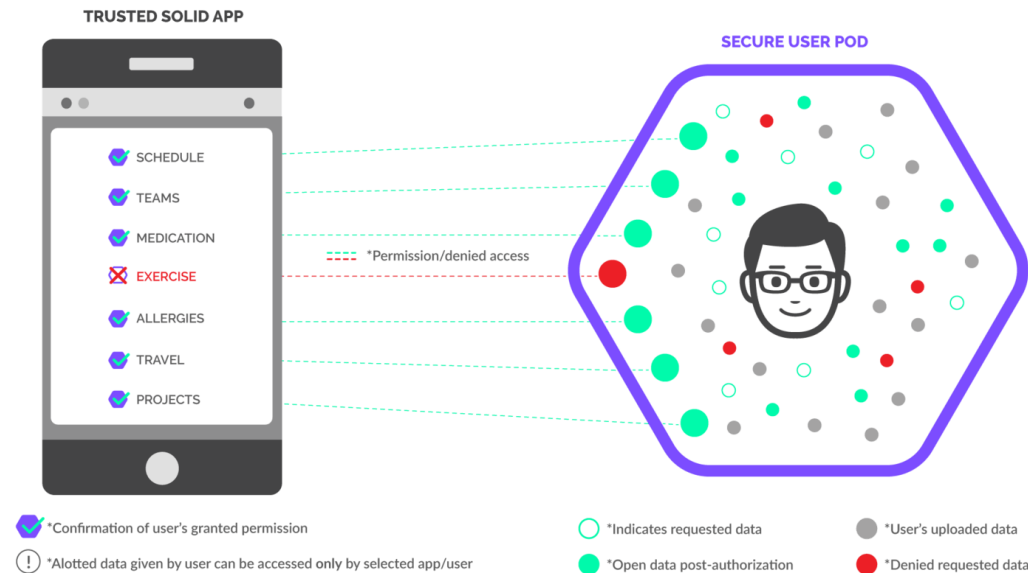
- Initially started at MIT
- Directed by Tim Berners-Lee



Let's create a POD

For creating a POD, we need a POD provider.
We can use an external one or host our own
POD server

- <https://inrupt.net/>



How to combine Solid and React?

- React components
<https://github.com/inrupt/solid-ui-react>
- Example project (javascript)
<https://github.com/pglez82/solid-react-example>
- Example project (with typescript)
<https://github.com/Arquisoft/solid-react-example/>
- Solid Documentation from Inrupt
<https://docs.inrupt.com/>

Additional documentation

Exercises about React state (in Spanish)

- I. [Ej1](#) Create a counter
- II. [Ej2](#) Complex states(objects)
- III. [Ej3](#) Different handlers()
- IV. [Ej4](#) Adding elements to an array
- V. [Ej5](#) Change a component's behaviour
(background color)

Additional documentation

Exercises rendering in React

- I. [Ej1](#) Array rendering
- II. [Ej2](#) Refactoring
- III. [Ej3](#) Adding elements to the array
- IV. [Ej4](#) Adding elements from a form

Additional documentation

Asynchronous programming

- I. [Ej1](#) Fetch() -> Do an API request
- II. [Ej2](#) useEffect()
- III. [Ej3](#) Conditional rendering
- IV. [Ej4](#) One Refactoring
- V. [Ej5](#) Requests using axios library

Additional documentation

Exercises using Typescript + React

- I. [Ej1](#) Counter with typescript
- II. [Ej2](#) 2nd exercise
- III. [Ej3](#) Example of an interface

Additional documentation

More links

- I. Course [Bootcamp Fullstack](#)
- II. [First Node.js conference](#) by Ryan Dahl

End of presentation