Universidad de Oviedo

School of Computer Science

EN
English

SOFTWARE ARCHITECTURE

Software Architecture

Lab. 03

React

Solid

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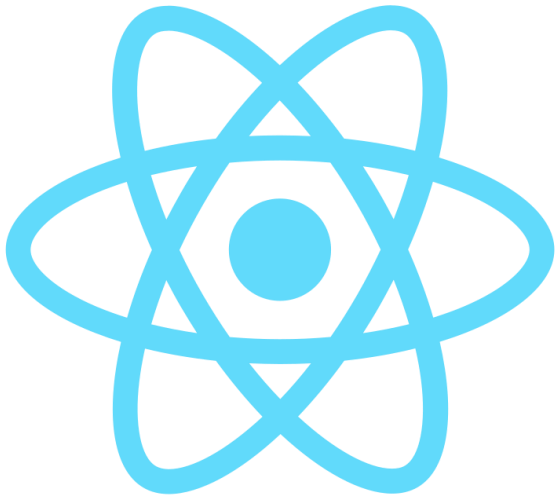
What is React.js?

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

- Open source
- Created by Facebook (Meta)
- Based on components



Why React?

Some reasons to use React:

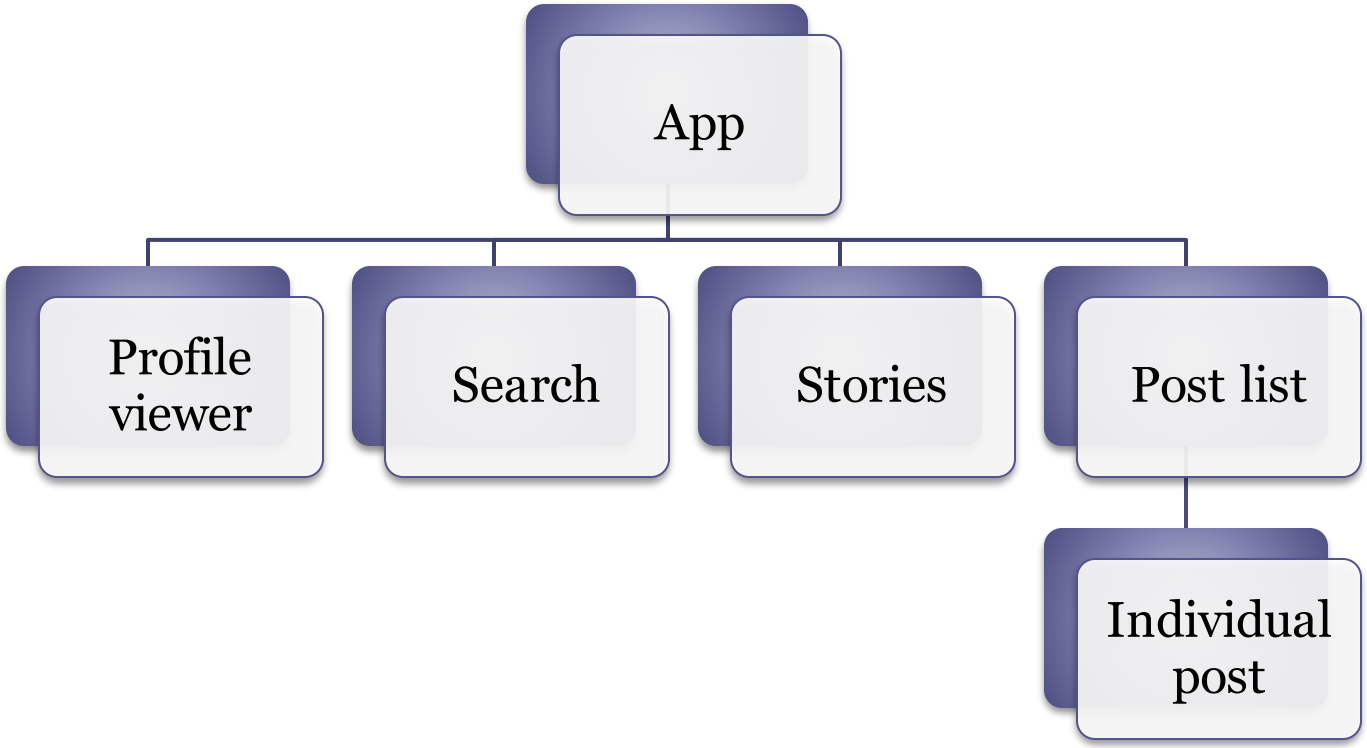
- Simplicity and easy to learn
- Reusable components
- Native approach (React Native)
- Lots of resources and tools for development
- Testability

Components

Pages are modelled using components

A component is a part of the user interface

Example: Instagram



Components

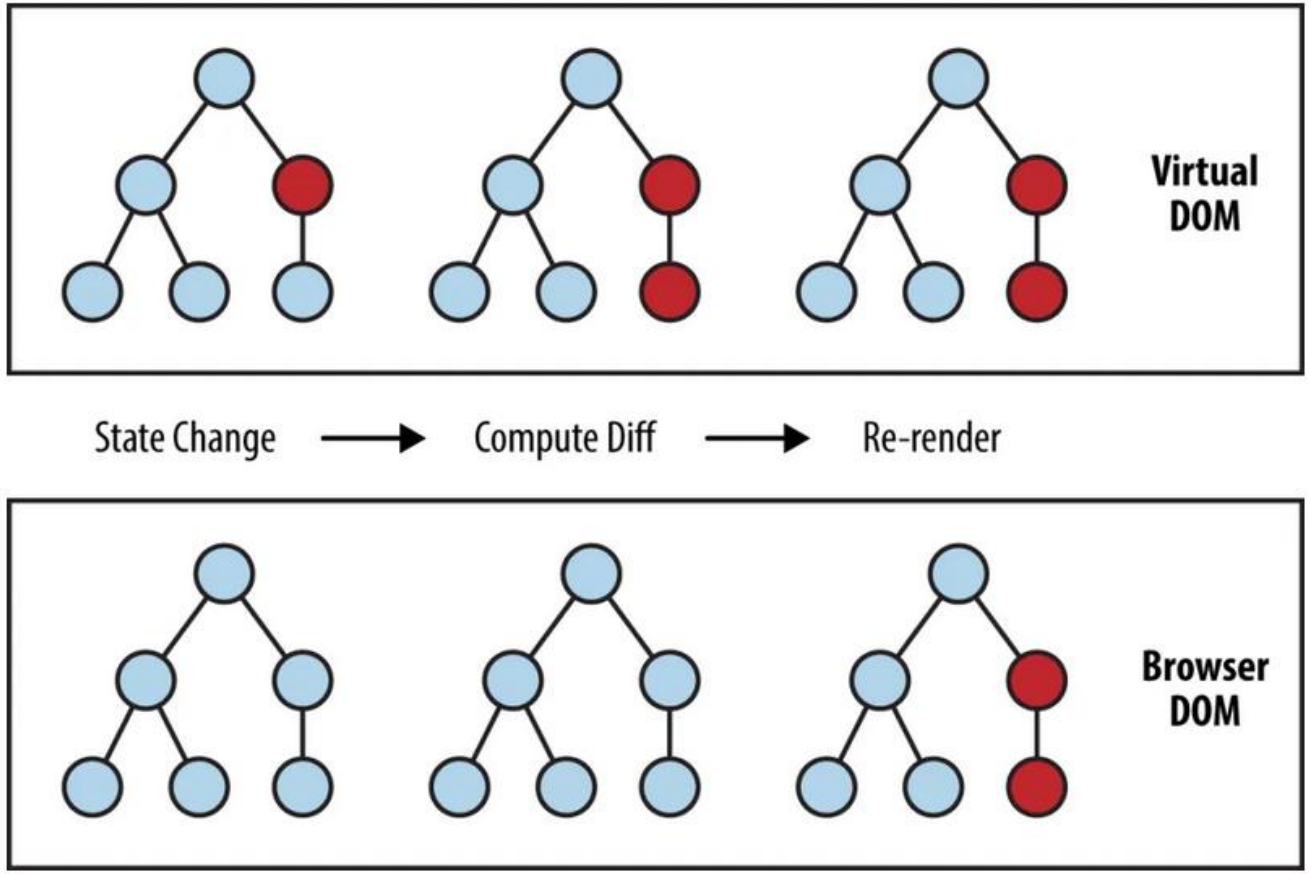
A component can be implemented as a JavaScript class

- 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

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[];
}

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>
    </>
  );
}
```

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

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

SOLID

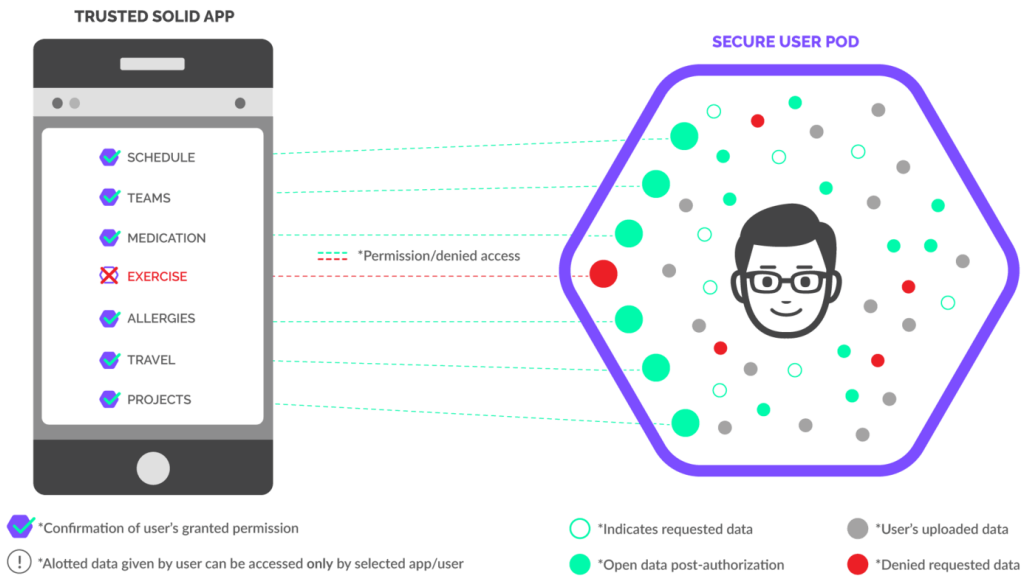
Is a technology for organizing apps, information and identities in a decentralized way

- 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/
- Awesome Solid
  https://github.com/pdsinterop/awesome-solid
- Videos introducing Solid by Jackson Morgan
  https://www.youtube.com/playlist?list=PLtNrk03_ElXBGf5fmrqqkYew9Z3L0YifN

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