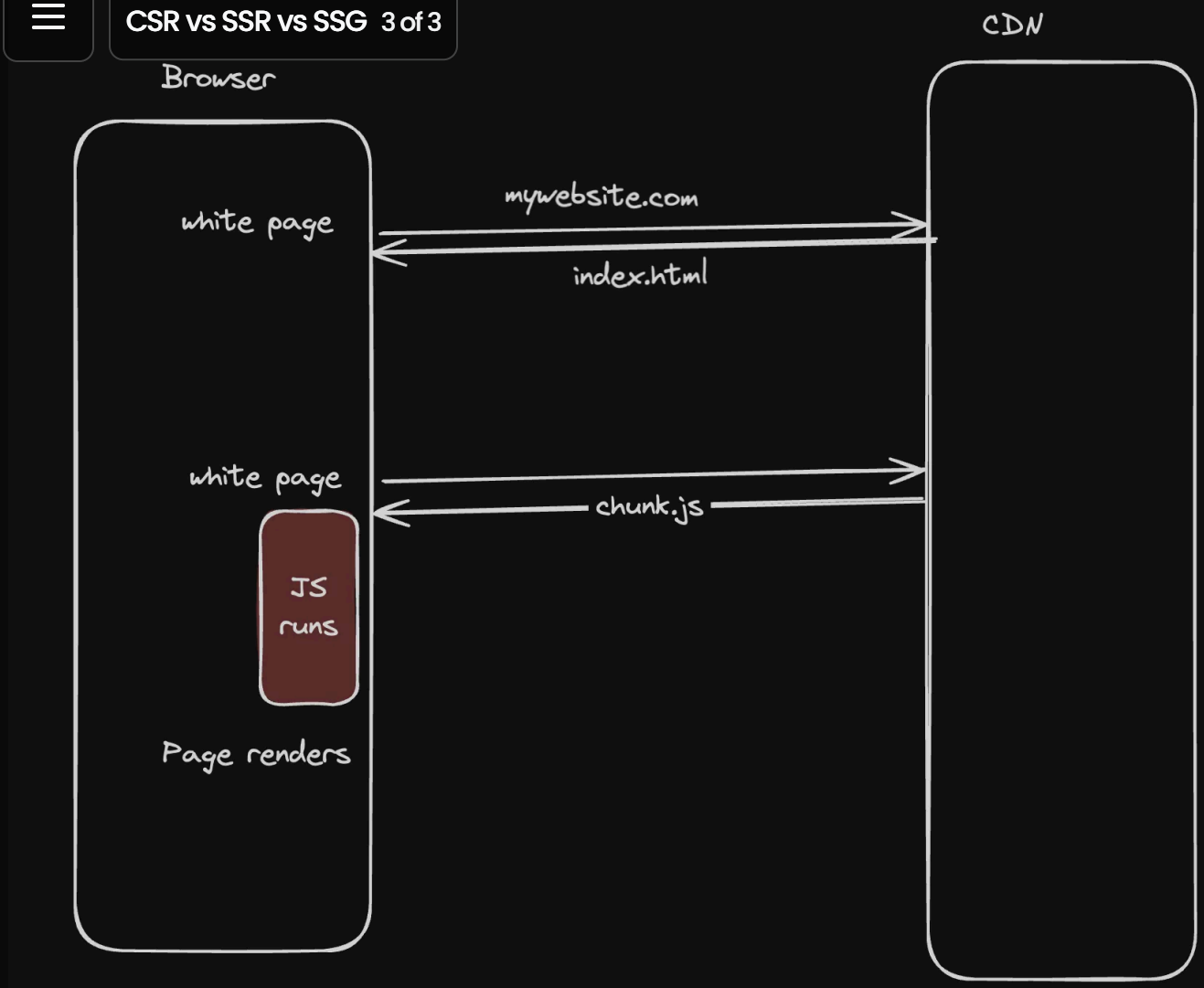
Client Side rendering

Client-side rendering (CSR) is a modern technique used in web development where the rendering of a webpage is performed in the browser using JavaScript. Instead of the server sending a fully rendered HTML page to the client

Good example of CSR - React



Let's see a react project in action

- Initialise a react project

```
npm create vite@latest
```

- Add dependencies

```
npm i
```

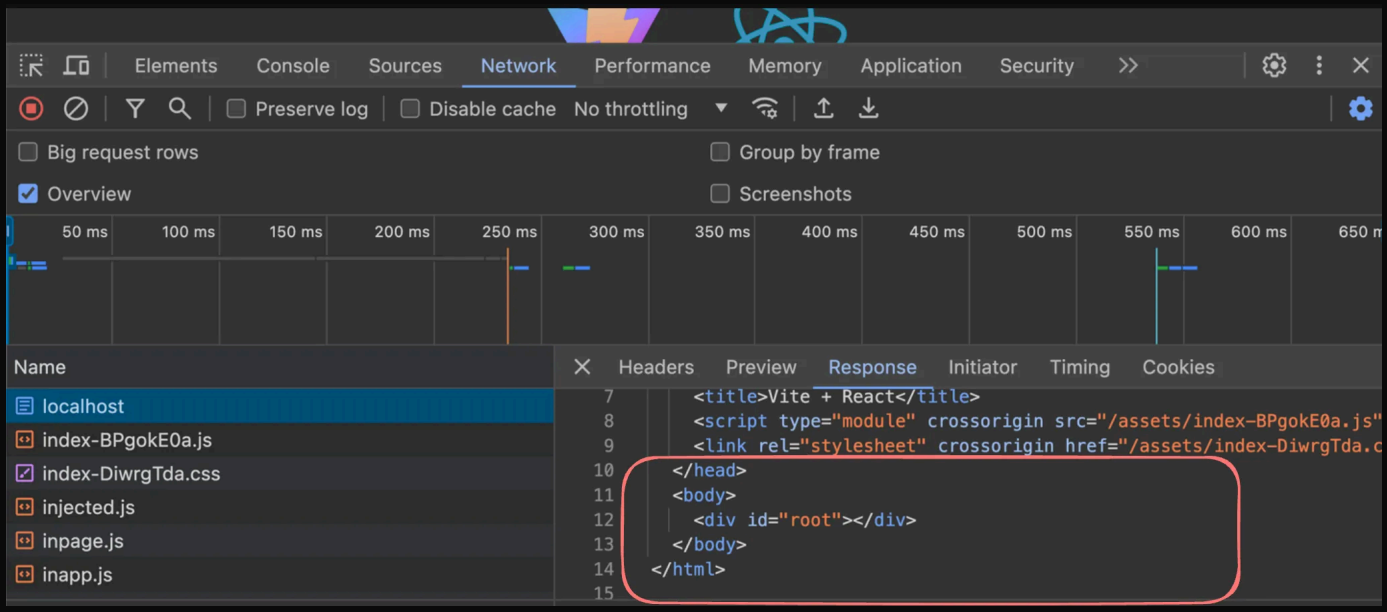
- Start the project

```
npm run build
```


- Serve the project

```
cd dist/
serve
```

Open the network tab and notice how the inital HTML file deosn't have any content



This means that the JS runs and actually `populates` / `renders` the contents on the page

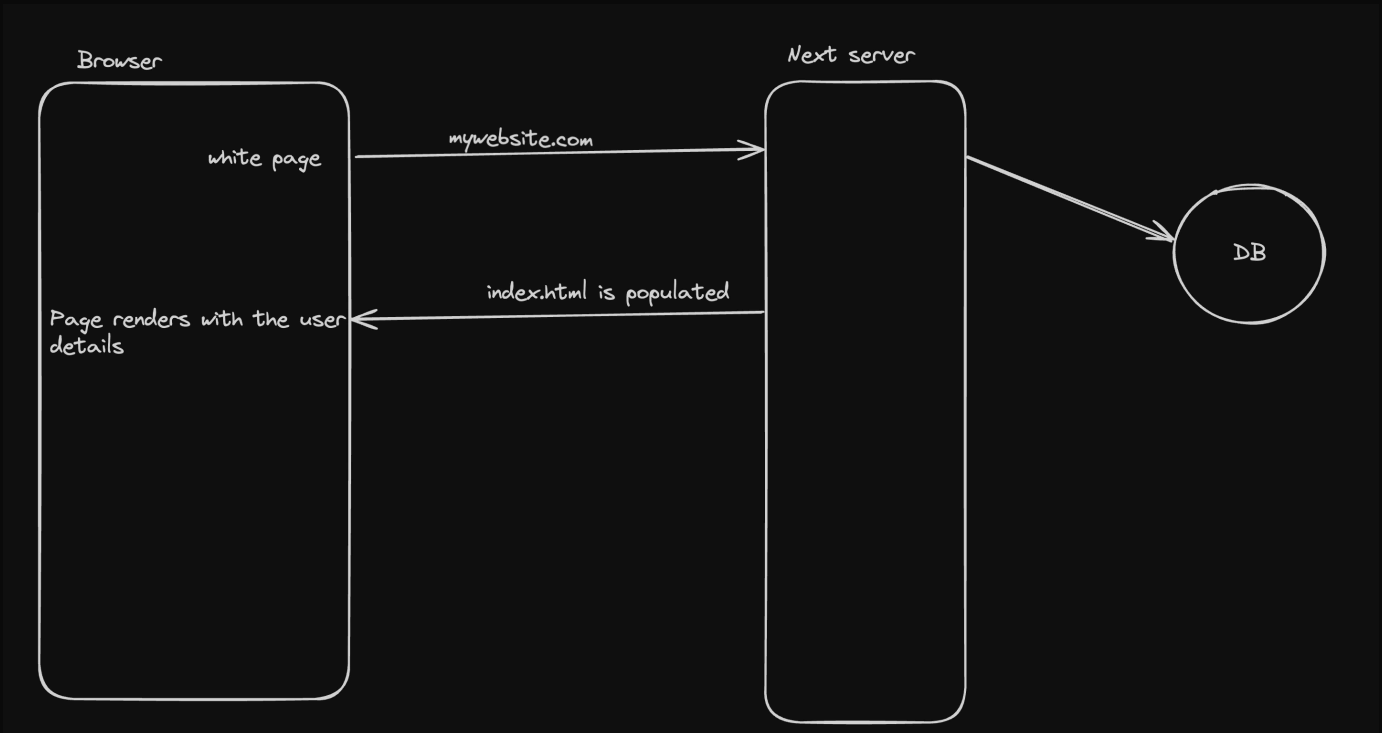
React (or CSR) makes your life as a developer easy. You write components, JS renders them to the DOM.

Downsides?

1. Not SEO optimised
2. User sees a `flash` before the page renders
3. Waterfalling problem

Server side rendering

When the `rendering` process (converting JS components to HTML) happens on the server, it's called SSR.



Why SSR?

1. SEO Optimisations
2. Gets rid of the waterfalling problem
3. No white flash before you see content

Try creating a NextJS app and notice the HTML file you receive is populated

- Create next app `npx create-next-app`
- Build the project

```
npm run build
```

- Start the NEXT Server

Notice the initial HTML page is populated

Downsides of SSR?

1. Expensive since every request needs to `render` on the server
2. Harder to scale, you can't cache to CDNs

Static site generation

Ref https://nextjs.org/docs/app/building-your-application/data-fetching/fetching-caching-and-revalidating

If a page uses **Static Generation**, the page HTML is generated at **build time**. That means in production, the page HTML is generated when you run `next build`. This HTML will then be reused on each request. It can be cached by a CDN.

Why?

If you use static site generation, you can defer the `expensive` operation of rendering a page to the `build time` so it only happens once.

How?

Let's say you have an endpoint that gives you all the `global` todos of an app.

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By `global todos` we mean that they are the same for all users, and hence this page can be statically generated.

https://sum-server.100xdevs.com/todos

- Create a fresh next project
- Create `todos/page.tsx`

```
export default async function Blog() {
  const res = await fetch('https://sum-server.100xdevs.com/todos')

  const data = await res.json();
  const todos = data.todos;

  console.log("todos", );
  return <div>
    {todos.map((todo: any) => <div key={todo.id}>
      {todo.title}
      {todo.description}
    </div>)}
  </div>

}
```

- Try updating the `fetch` requests

Clear cache every 10 seconds

```
const res = await fetch('https://sum-server.100xdevs.com/todos', {
  next: { revalidate: 10 }
});
```

Clear cache in a next action

```
import { revalidateTag } from 'next/cache'
const res = await fetch('https://sum-server.100xdevs.com/todos', { next: { tags:
```

```
'use server'

import { revalidateTag } from 'next/cache'

export default async function revalidate() {
  revalidateTag('todos')
}
```