Diffing, in the context of web development and particularly in libraries like React, is the process of comparing two versions of the virtual DOM to identify changes. This comparison helps in determining what parts of the actual DOM need to be updated to reflect the new state of the application. The main goal of diffing is to optimize the updating process, ensuring that only the necessary parts of the DOM are changed, thus improving the performance and efficiency of rendering updates.

**How Diffing Works**

Diffing is a technique used by many modern JavaScript frameworks and libraries, like React, to optimize updates to the user interface (UI). The idea is to efficiently determine the changes needed to update the UI by comparing the new version of the virtual DOM with the previous one.

1. **Virtual DOM Creation**

When the state of a React component changes, a new virtual DOM is created representing the UI after the state change.

1. **Diffing Algorithm**

React uses a diffing algorithm to compare the new virtual DOM with the previous version. This algorithm identifies what has changed—whether elements have been added, removed, or updated.

1. **Minimal Updates**

Based on the diffing results, React calculates the minimum number of updates needed to bring the actual DOM in sync with the new virtual DOM. This process is efficient because it avoids unnecessary re-rendering of unchanged parts of the UI.

1. **Batch Updates**

React applies these updates in batches to the actual DOM, improving performance by reducing the number of direct manipulations of the DOM, which can be slow.

The key advantage of diffing is its ability to update only the parts of the DOM that need to change, resulting in faster and more efficient rendering.