**METRICS FOR PERFORMANCE TESTING**

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| --- | --- | --- | --- | --- |
| Metric | 20 | 50 | 500 |  |
| Largest Content Pain(LCP) | Under 2.5s | Can still be acceptable if under 4s | Over 4s (needs improvement) |  |
| Cumulative Layout Shift(CLS) | Below 0.1 | Can still be acceptable under 0.25 | Over 0.25 (needs improvement) |  |
| Interaction to Next Paint (INP) | Under 200ms | 200ms - 500ms (improvement needed) | Over 500ms (critical improvement needed) |  |
| Time to First Byte(TTFB) | Under 200ms | 200ms - 800ms (acceptable, but could be improved) | Over 800ms (needs significant improvement) |  |
| First Contentful Paint(FCP) | Under 1.8s | 1.8s - 3s (acceptable, but improvement suggested) | Over 3s (needs significant improvement) |  |
| Total Blocking Time(TBT) | Under 200ms | 200ms - 500ms (acceptable, but improvement needed) | Over 500ms (critical improvement needed) |  |

### **1. Largest Contentful Paint (LCP)**

**Definition**: LCP measures how long it takes for the largest visible content element (usually an image or a block of text) to load on the page.

**Impact on Users**:

* LCP indicates how quickly the main content of the page is visible to the user. A fast LCP means users can begin interacting with the page sooner, improving their overall experience.
* A poor LCP (e.g., over 2.5 seconds) can make users think the page is slow, leading to frustration and possibly leaving the site before it even loads completely.
* **Good Benchmark**: LCP should occur within 2.5 seconds or less to provide an optimal user experience.

### **2. Cumulative Layout Shift (CLS)**

**Definition**: CLS measures the visual stability of a page. It tracks how much the content shifts around during page loading, which can be disorienting for users.

**Impact on Users**:

* High CLS values mean that elements like buttons, text, or images move unexpectedly as the page loads, leading to a poor and frustrating experience.
* For example, users may accidentally click the wrong button because a page layout shifts just as they try to click it.
* **Good Benchmark**: A CLS score of 0.1 or less is ideal, meaning that there are minimal unexpected shifts during page load.

### **3. Interaction to Next Paint (INP)**

**Definition**: INP measures the responsiveness of a page to user interactions. It evaluates the time between when a user interacts with the page (like clicking or typing) and when the page responds with the next visual change or "paint."

**Impact on Users**:

* A high INP score (e.g., over 200ms) can make the page feel unresponsive, leading to frustration for users trying to interact with the page.
* Pages with a fast INP provide immediate feedback to users, ensuring smoother interactions and a more pleasant browsing experience.
* **Good Benchmark**: INP should be below 200 milliseconds to maintain a responsive experience.

### **4. Time to First Byte (TTFB)**

**Definition**: TTFB measures the time it takes for a browser to receive the first byte of data from the server after making a request. It includes server processing time, network latency, and the response time of the server.

**Impact on Users**:

* A high TTFB (e.g., over 800ms) can result in users waiting longer for the page to start loading, which can feel like a delay before anything appears on the screen.
* Reducing TTFB improves the initial responsiveness of the page and can help improve the user experience, especially in regions with higher network latency.
* **Good Benchmark**: A TTFB of under 200 milliseconds is considered good.

### **5. First Contentful Paint (FCP)**

**Definition**: FCP measures the time it takes for the first piece of content (such as text or an image) to be rendered on the screen after the page starts loading.

**Impact on Users**:

* A quick FCP indicates that users can start seeing content quickly, improving the perceived performance of the website.
* Slow FCP (e.g., over 3 seconds) can create a feeling of slowness, as the user is waiting too long before seeing any visual content.
* **Good Benchmark**: FCP should occur in under 1.8 seconds for an optimal user experience.

### **6. Total Blocking Time (TBT)**

**Definition**: TBT measures the total amount of time during which the main thread is blocked and cannot respond to user input (like clicking, scrolling, or typing).

**Impact on Users**:

* High TBT values (over 300 milliseconds) can make the page feel sluggish, as users cannot interact with it while it's blocked by JavaScript or other tasks.
* Reducing TBT helps ensure that users can interact with the page as soon as possible, making the site feel more responsive and fluid.
* **Good Benchmark**: TBT should be under 200 milliseconds for a smooth user experience