**Performance Report**

**Gamehub**

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1. **Introduction**

The web performance review for GameHub was conducted using Lighthouse. The review focuses on critical aspects such as performance, accessibility, best practices, and SEO. This document outlines the findings and provides recommendations for improving the web application’s performance and overall user experience.

1. **Performance Metrics**

**Performance Score**: 62

The performance score is calculated based on the following key metrics:

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| **Metric** | **Value** | **Description** |
| First Contentful Paint (FCP) | 2.9s | The time it takes for the first text or image to be painted. |
| Largest Contentful Paint (LCP) | 4.3s | The time it takes for the largest text or image to be painted. |
| Total Blocking Time (TBT) | 40 ms | The total amount of time that the page is blocked from responding to user input. |
| Cumulative Layout Shift (CLS) | 0.008 | Measures the visual stability of the page by tracking layout shifts. |
| Speed Index (SI) | 3.1s | Measures how quickly the content is visually displayed during page load. |

1. **Accessibility**

**Accessibility Score**: 92

Accessibility checks highlight opportunities to improve the web app’s accessibility:

* Contrast Issues: Background and foreground colors do not have a sufficient contrast ratio.
* Manual Checks Needed: Additional items need to be manually checked to ensure comprehensive accessibility compliance.

1. **Best Practices**

**Best Practices Score**: 100

Issues identified under best practices:

* Ensure CSP is effective against XSS attacks: Implement Content Security Policy (CSP) to protect across cross-site scripting (XSS) attacks.

1. **SEO**

**SEO Score**: 82

SEO checks ensure that the page follows basic search engine optimization advice:

* Document does not have a meta description: Add a meta description for better search engine visibility.
* Invalid robots.txt: Fix 21 errors found in the robots.txt to allow crawlers access to your app.

1. **Conclusion**

Reflecting on the performance review of the GameHub web application, significant strides have been made in optimizing the user experience. The application achieves an impressive accessibility score of 92, underscoring the effectiveness of the implemented strategies. However, the review also highlights several areas for potential improvement.

**Performance reflection**: The performance metrics indicate that the GameHub application needs improvements in key areas such as First Contentful Paint (FCP) and Largest Contentful Paint (LCP). These results suggest that further optimization of the initial load time and visual stability is required. The minimal Total Block Time (40 ms) and low Cumulative Layout Shift (0.008) reflect a responsive interface, but there is room for enhancement in load performance.

**Identified bottlenecks**: Despite the high accessibility score, there are areas where I can improve. Addressing contrast issues will enhance the overall user experience for individuals relying on assistive technologies.

**Applied improvements**: Throughout the development process, several improvements have been implemented to enhance the application’s performance. Utilizing robust adaptive hashing algorithms like BCrypt for password hashing and implementing JSON Web Tokens (JWT) for secure authentication are notable security enhancements.

**Future enhancements**: To further enhance the GameHub application, the following actions are planned:

* **Improve Performance**: Optimize images, minify, and reduce unused JavaScript, and enable text compression.
* **Enhance SEO**: Add and properly configure SEO elements like meta descriptions and improve the validity of robots.txt file.
* **Maintain Best Practices**: Continuously ensure that the Content Security Policy (CSP) is up-to-date and effective against XSS attacks.

By addressing these areas, the GameHub application can continue to provide a high-quality user experience while maintaining robust security and accessibility standards. Regular audits, continuous monitoring, and a commitment to adopting best practices will ensure that the application remains performant, secure, and user-friendly.

1. **Comparison to Steam**

**Steam Lighthouse Report**

**Performance** Score: 52

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| **Metric** | **Value** | **Description** |
| First Contentful Paint (FCP) | 0.9s | The time it takes for the first text or image to be painted. |
| Largest Contentful Paint (LCP) | 3.0s | The time it takes for the largest text or image to be painted. |
| Total Blocking Time (TBT) | 750 ms | The total amount of time that the page is blocked from responding to user input. |
| Cumulative Layout Shift (CLS) | 0.006 | Measures the visual stability of the page by tracking layout shifts. |
| Speed Index (SI) | 2.0s | Measures how quickly the content is visually displayed during page load. |

**Accessibility** Score: 75

**Best Practices** Score: 63

**SEO** Score: 75

**Comparison Insights**

1. **Performance**

* **GameHub: 62**
* **Steam: 52**

GameHub outperforms Steam in overall performance, especially in terms of Total Blocking Time and Cumulative Layout Shift. However, Steam has a faster First Contentful Paint and Speed Index, indicating quicker initial loads.

1. **Accessibility**

* **GameHub: 92**
* **Steam: 75**

GameHub has a higher accessibility score, reflecting better compliance with accessibility standards.

1. **Best Practies**

* **GameHub: 100**
* **Steam: 63**

GameHub adheres more closely to best practices and overall security measures.

1. **SEO**

* **GameHub: 82**
* **Steam: 75**

GameHub has a higher SEO score, indicating better optimization for search engine visibility.

**Recommendations for GameHub:**

* **Improve initial load times**: Focus on optimizing the First Contentful Paint and Largest Contentful Paint by reducing render-blocking resources and optimizing JavaScript execution.
* **Maintain low Total Blocking Time**: Continue to monitor and optimize JavaScript to keep the Total Blocking Time minimal.
* **Enhance visual stability**: Keep working on maintaining a low Cumulative Layout Shift to ensure a stable visual experience.

By comparing with Steam, GameHub can identify specific areas of strength and opportunities for further optimization, ensuring a competitive edge in performance and user experience.