Measurement and Evaluation of the effectiveness of techniques towards improving Client-side performance

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1. Introduction

As web pages increase in size and content pages become more difficult to download and display properly [1]. On the other hand, server costs for hosting & carbon dioxide are increased by higher storage requirements [2].

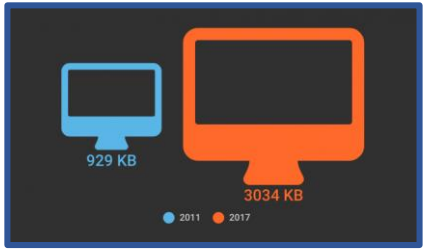
Towards solving this problem a number of client-side performance practices, tools and techniques have been conceived.

2. Aim

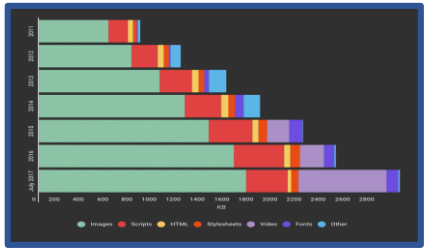
The aim of this project is to measure & determine the effectiveness of these practices towards increasing the performance of client-side performance, as well as minimizing server usage.

3. Objectives

1. Perform a thorough research of more and less known performance techniques
2. Apply these techniques to one or more “mock data” websites with “mock data” and extract speed and file size metrics
3. Design “before and after” statistics with these metrics



Average size of a webpage [1]



Average size of media on a webpage [1]

4. Methods

1. Online reading of research papers, other statistics and web dev communities’ research. The research will be organized & catalogued with Mendeley.
2. Building multiple HTML “mock” pages with large amounts of random data. Metrics will be extracted with Firefox & Download simulation will be required.
3. If a technique requires it, rewrite the page’s JavaScript code.
4. Automate some processes with a task runner such as Gulp [3] if possible.
5. Measure results of all possible combinations by using the ANOVA [4] statistical model.

5. Expected Results

The expected result is a large amount of statistics which will help in determining the effectiveness of client-side performance improvement techniques.

References

[1] Tammy Everts, “SpeedCurve | The average web page is 3MB. How much should we care?” [Online]. Available: https://speedcurve.com/blog/web-performance-page-bloat/. [Accessed: 03-Oct-2017].
[2] C. Cappiello *et al.*, “Monitoring and Assessing Energy Consumption and CO2 Emissions in Cloud-Based Systems,” in *2013 IEEE International Conference on Systems, Man, and Cybernetics*, 2013, pp. 127–132.
[3] “gulp.js.” [Online]. Available: https://gulpjs.com/. [Accessed: 05-Oct-2017].
[4] H. Scheffé, *The Analysis of Variance*. New York: Wiley, 1959.