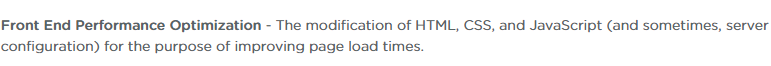
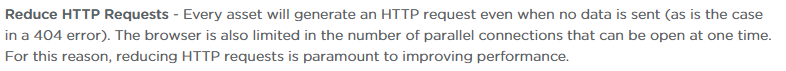
**Performance Optimization**



A picture containing text, font, screenshot, algebra

Description automatically generated

* HTTP – Hyper Transfer Protocol
  + <https://developer.mozilla.org/en-US/docs/Web/HTTP>
* Page speed - <https://developers.google.com/speed/>
  + Family of tools that can help analyze the performance of a website
* It's important to pay attention to the total number of HTTP requests on a web page. Even when no data is sent, as is the case with a 404 error, an HTTP request will still take up time. Each HTTP request is generally fast, but if there lots of assets (even small ones like icons), it can add up.



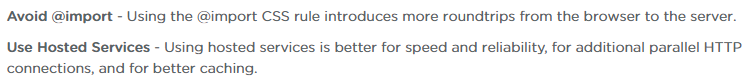


* 404 errors are caused by an incorrect path. This could be due to a typo in the URL, a file has been moved or a file has been deleted
* Images are almost always the biggest use of bandwidth. Most sites have HTML, CSS, and JavaScript, but images like photos or artwork are regularly 5 or 10 times the size. Making careful choices about the number of images you load, how they load, their compression, resolution, and their file format, can all make a big impact on your page load times.

A picture containing text, font, screenshot, algebra

Description automatically generated

* + When using photoshop, optimized images can be exported using the “save for web” feature
  + Its important to properly resize images because if the server delivers more pixels than are actually used, its just wasted bandwidth
* Optimizing CSS
  + Removing CSS imports and using hosted font services can help speed up page load times



A picture containing text, screenshot, font, algebra

Description automatically generated

* Creating a Sprite Map
  + A sprite map combines many small images into one big image, resulting in a single HTTP request instead of many
  + <https://css-tricks.com/svg-symbol-good-choice-icons/>

A picture containing text, font, screenshot

Description automatically generated

A picture containing text, font, white, handwriting

Description automatically generated

* Optimize JavaScript
  + We should try to load our js file at the bottom of the html page is possible
    - JS file will block any further rendering until the JS has fini
    - The reason we want to do this is because it will improve perceived performance. Html & css will load fully before js is parsed
  + Async attributes can be used on JS that are completely independent of any other JS on the page



* + Minifying Assets removed extra bits and reduces overall page weight, combines many requests down into one
    - For css: <https://www.toptal.com/developers/cssminifier>
    - [For JS: https://closure-compiler.appspot.com/home](For%20JS:%20https://closure-compiler.appspot.com/home)
  + Minification cannot be reversed so its important to keep a copy of the original file for modification later

