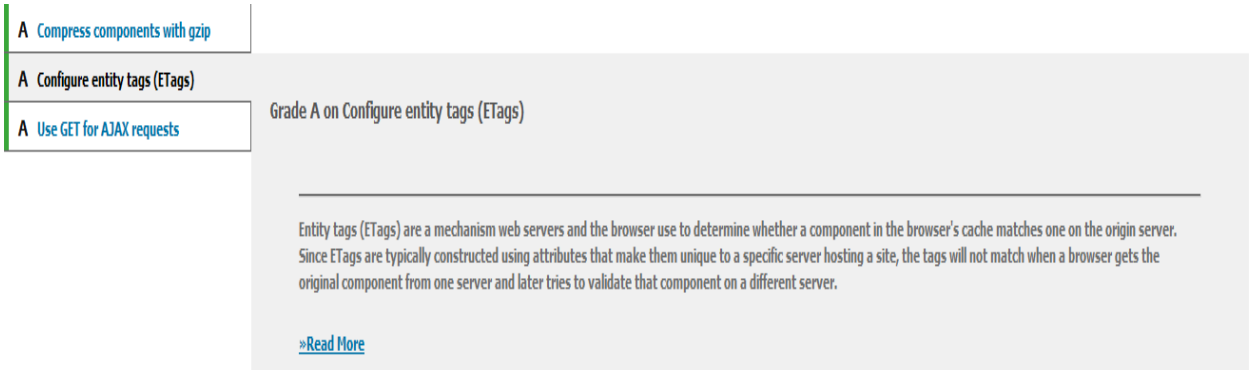
Rules 12, 13, 15, 16, 18, 21

12. Remove Duplicate Scripts

    We did analyze the functions of jQuery and Mootools since they exhibit the similar functionality, but did not find any common script that we can get rid of from the same.

13. Configure ETags

    ETags are a variance of the conditional get requests. They are used as flexible substitutes to the last-modified-date mechanism of validating content in the cache. For instance, if the one-second resolution of http date values is not sufficient while serving dynamic webpages – we might need to check the output of each of the subqueries to ensure that the copy on the cache is current. This might be time consuming and complex unless there is some date modified column stored alongside the result set of all queries. Since the page that we are concerned about – does not require any of the special cases essentially – we removed the ETag attribute. To reflect these images on the content delivery network, we had to revvive the filenames of all the resources (to invalidate the current cached resources). The test was done by inspecting the response headers of the resources.



Given below is statistical information of total load times (averaged over three trials):

Before the Rule was Applied		**After the Rule was Applied**	
Empty Cache	**Primed Cache**	**Empty Cache**	**Primed Cache**
5.8s	202.7ms	4.89s	205ms

15. Split the Initial Payload

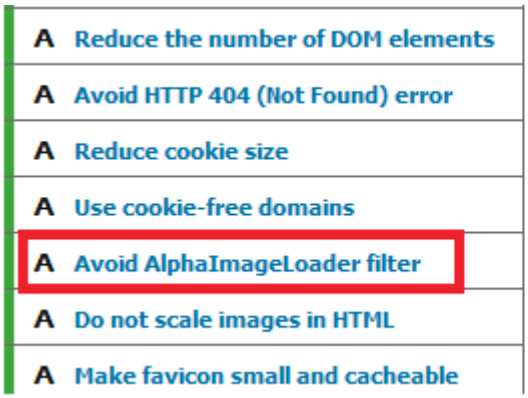
    This rule stressed on the need to split javascripts into those components that are required during the onload of the page and let them load initially whereas load the rest of the js functions after the html elements are rendered so that the huge javascript file does not block other parallel downloads. We were trying to comparing the load times between the javascript as a single resource vs. splitting the contents into different javascript files. This comparison is essential because it determines if the overhead of http header is greater than the overhead of the javascript blocking.

    Here, basically we tried to see if we can leverage some existing tools, so that we get payload split and take measurements. But after a number of attempts with the tool like doloto, which failed to give any proper results, we decided to keep the payload as a single js file. (as trying manually, looks like an implausible task given the combinations that can be taken and its probably not worth the gain obtained.)

16. Optimize Images

    All images were optimized by using tools smush.it. This tool makes sure that it removes unnecessary bytes (comments, EXIF information) from image files. This tool converts all gif images to png-s if the resulting image has a size that is lesser than that of the original. This action is followed by the use of another tool (tinypng) that performs the function of selectively decreasing the number of colors in the image so that it corresponds to the palette size of image itself. This results in conversion of large true color PNG files automatically into 8-bit index

colour images. Though, this is considered lossy compression – the tool ensures that the quality of the image through this process of quantisation does not degrade. All Alpha Image Loader Filters were removed from the css, in the previous iteration itself. This filter blocks rendering as the image is getting downloaded. This option also increases the memory consumption at the client side: additionally because it is applied per element and not per image. This filter was essentially put in place to fix a problem with semi-transparent true color PNGs for IE < 7. The filters were hence deemed unncessarily increasing the size of the stylesheets since the website will generally be run on the latest version of the browsers. Please find below corresponding screenshot from YSlow.



18. Use iframes sparingly

IFrames blocks the onload event of its parent window until the entire iframe gets loaded due to which the busy indicator in the browser does not stop immediately. This also gives the user an impression that the page is slower. In this case, the content in the iframe belongs to the same webserver / domain. Hence, there is even no need to stick to keeping portalsearch content in the iframe because of security concerns. Another important reason for removing iframes is that

– they share the connection pool of the parent itself in the browser. This might use up all the resources leaving the main window no choice but to wait for the iframe to finish loading. This is frustrating for an end-user especially if the content in the iframe is not critically important as the data in the parent window itself. The situation is somewhat similar in this case as well. The iframe in the home page was removed and included inline within the html document of the home page.

In addition to the above rule, we also made all the changes you suggested to us regarding rule 8 from the previous iteration. That is, we combined all the inline scripts and stylesheets from portal_search into the single resource (that is referenced in index.html) and made sure that the website served the minified (and obfuscated) version of this new file. The load times we measured is shown below-

Before the Rule was Applied		**After the Rule was Applied**	
Empty Cache	**Primed Cache**	**Empty Cache**	**Primed Cache**
4.89s	296ms	4.96s	206.67ms

Here there is a reduction in case of primed cache as we have moved some inline scripts and js to the external css and js files. Though, our measurements showed a slight increase in case of empty cache load time mostly due to increase in the html content that we moved from portalsearch page to index.html. (though again, this was a smaller difference as compared to primed cache values)

21. Don't scatter inline scripts

There are currently no active inline scripts in the html page of our webserver. We have all our scripts moved externally. Even the scripts that we had inline inside the portal page had been moved externally to the respective js file. This has been mentioned along with the removal of

iframes in rule 18.

*** Note:- All the load times were measured as averaged over three different measurements to get a more accurate value.