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Y-Slow Performance Optimization Report for www.ethixsystems.com

Performance Grade Before: F (59)

Performance Grade After: B (88)

1. **Make fewer HTTP requests**
    - Explanation: This benchmark measures the number of requests a website makes to pull all of the content it needs. The goal is to keep this as streamlined as possible to reduce load times and network utilization.
    - Initial grade: A
    - Final grade: A
    - Action Taken: No action was needed; already optimized.
2. **Use a CDN**
    - Explanation: Content Delivery Networks place your static content, such as images and documents, across multiple geographically dispersed servers to reduce access times for all users.
    - Initial grade: F
    - Final grade: F
    - Action Taken: No action was needed. Since the static content of this website is not heavily trafficked and most of its traffic is local, the cost of joining a CDN does not justify the performance increase.
3. **Add an Expires header**
    - Explanation: Expiration headers are used to keep a long-term cache of content on a website, reducing the number of redundant requests that users make for this content. Not only does this make everyone's load times faster on the site, but it also minimizes overall network traffic to the web server.
    - Initial grade: F
    - Final grade: A
    - Action Taken: We added an Expires header to all of the applicable file types.

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4. **Gzip components**
    - Explanation: Gzip compresses static items, such as images and static content files, so they transfer over the internet more quickly.
    - Initial grade: F
    - Final grade: A
    - Action Taken: We Gzipped all applicable static components.
5. **Put CSS at the top**
    - Explanation: CSS controls how a website appears on your screen. When it is defined first, site content will be displayed as it is received because the browser will know how to display that content.
    - Initial grade: A
    - Final grade: A
    - Action Taken: No action was needed; already optimized.
6. **Put JS at the bottom**
    - Explanation: Often when Javascript loads, it prevents other content on your page from being loaded until the Javascript is completely loaded into memory. When Javascript is included at the bottom of a webpage, this allows all of the important content to load first and more quickly.
    - Initial grade: B
    - Final grade: B
    - Action Taken: One of the three scripts was moved to the bottom of the site. The reason the other two could not be moved is that they contain calls that are required to run as the page is loading, which means they must be defined at the top of the file. Quite often some of the Javascript cannot be moved to the bottom of the site for practical reasons.

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7. **Avoid CSS expressions**
    - Explanation: CSS expressions are a way to dynamically change how something appears on a page in certain situations. However, these expressions are *very* taxing on the web browser and can make a site appear to react very slowly to user interaction. Javascript event handlers should be used instead to achieve these style changes.
    - Initial grade: A
    - Final grade: A
    - Action Taken: No action was needed; already optimized.
8. **Make JS and CSS external**
    - Explanation: When Javascript and CSS styles can be placed in files external to the HTML webpage itself, then these pages can be cached by the browser which will increase load times and network usage across the site. This is only useful, however, if these CSS styles and Javascript are used on multiple pages of your website.
    - Initial grade: n/a
    - Final grade: n/a
    - Action Taken: YSlow is currently unable to tell if the website being analyzed is just a common home page or a more in-depth site. We know, however, that this is a complex website, so we kept the CSS and Javascript external.
9. **Reduce DNS lookups**
    - Explanation: Resolving a lot of hostnames on a website can take a substantial amount of time and is reliant on the performance of a user's current DNS server. Also, in most browsers page content won't be displayed on a site until it can resolve all of the external domain names that are referenced on the page.
    - Initial grade: A
    - Final grade: A
    - Action Taken: No action was needed; already optimized.

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10. Minify JS

- Explanation: You can reduce the file size of Javascript files by removing all the unnecessary whitespace from the file (minifying) and changing all of the variable names in the file to one or two letter words (obfuscating). This enabled the files to load quicker and take less bandwidth to transfer.
- Initial grade: C
- Final grade: A
- Action Taken: None of the Javascript files on the site were minified or obfuscated. We performed those actions using the JSMin and ShrinkSafe tools.

11. Avoid redirects

- Explanation: When a site uses HTTP 301 or 302 redirects to take a user from a nonexistent page to the correct location, this wastes server bandwidth and causes the user to experience an unneeded delay before arriving at the site they requested. There are ways to redirect at the server configuration level that can reduce some of this overhead.
- Initial grade: A
- Final grade: A
- Action Taken: No action was needed; already optimized.

12. Remove duplicate scripts

- Explanation: When script code is duplicated is causes unnecessary caching, requests to the web server, and script evaluation by the browser. Keeping scripts centralized and defined once will keep a site running smoothly.
- Initial grade: A
- Final grade: A
- Action Taken: No action was needed; already optimized.

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13. Configure ETags

- Explanation: Entity Tags are a way for a web browser to track content received from a given website with an internal identifier for the purposes of maintaining the site cache. This feature is most useful under the right circumstances when a single server is hosting the site. Since the YSlow tool always assumes that you'll be distributing your content from several servers (in the same way it assumes you would want a CDN in all cases), it is not always appropriate to configure this setting the way Yahoo would want you to.
- Initial grade: F
- Final grade: A
- Action Taken: Since the static content on this website does not change very often, we decided that the ETags weren't all that beneficial in this situation, so we removed them entirely to reduce the size of the HTTP headers.