

Performance Made Easy (kinda)

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About Sonja

Passionate **Data Scientist**

Got fired (I mean fired, not laid off - everyone should try this) then started 1st of many businesses in the Valley - Currently have 3

- WP for small/medium biz & orgs - [Zosi.me](https://zosi.me)
- Business Intelligence, Analytics & Data Mining
- Bonsai

Wrote my first CMS before WordPress in 2002

Chair 2 Silicon Valley groups

- Tech Women (1,400+ members)
- Business Intelligence (4,000+ members)

Started doing WP sites pro bono around 2.7-2.9
word spread & people wanted to give me money

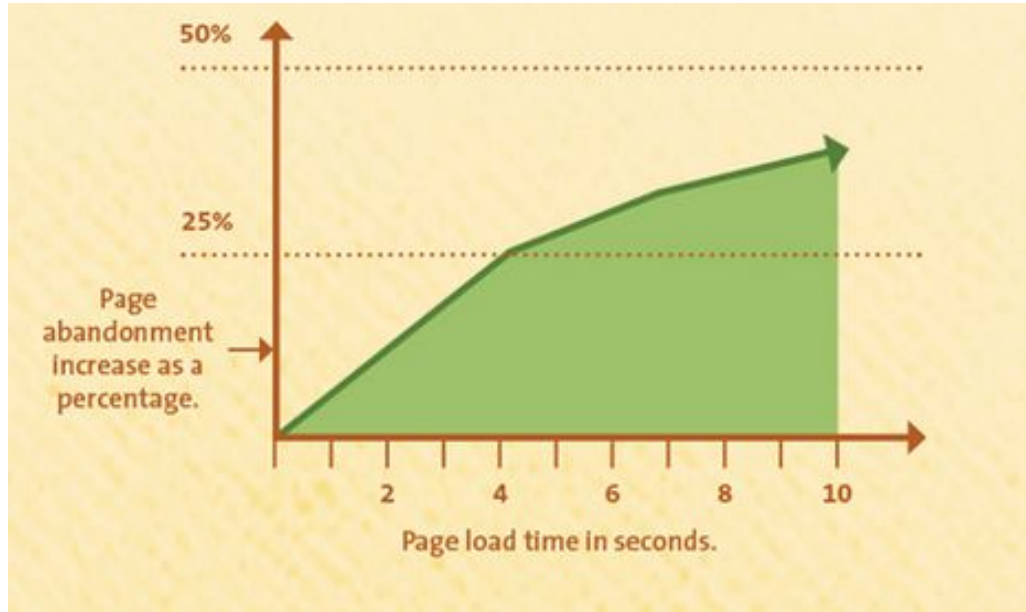
What is Performance?

Speed - How fast does it need to be?

1. Viewer tolerance
2. SLA (Service Level Agreement)
 - a. Example: Page load in under 2 seconds as measured by ...
3. Budget

What is Performance?

Speed - How fast does it need to be?



Source:
Kissmetrics

What is Performance?

Throughput (often ignored during dev/setup)

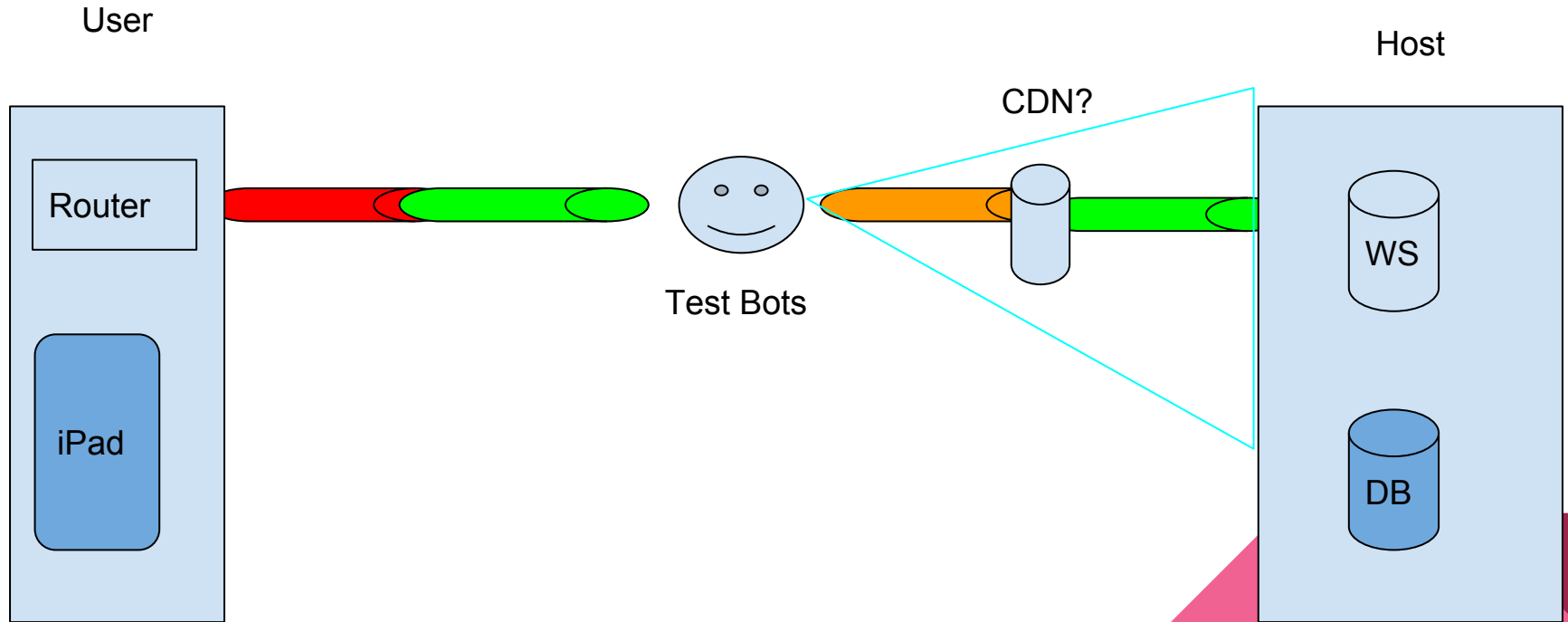
- number of transactions per second an application can handle
- NOT (daily visitors) / (seconds per day) !
- Arrival times are not evenly distributed
- Must find peak interarrival rates
 - estimate or model using queueing theory / formulas
- Improved SLA example - 99.3% of pages served in under 2 seconds
- The knee of the curve - when throughput assassinates speed

What is Performance?

Latency

- Normally the time between making a request and beginning to see a result. (psychologically important definition)
- Sometimes “the time between making a request and completion of the result.”
- Takes into account the big picture
- Rarely guaranteed to client because of factors beyond your control like hurricanes and greedy companies.

What are the obstacles?





Latest Performance Report for: http://kraskis.com/

Report generated: Thu, Oct 13, 2016, 4:53 AM -0700

Test Server Region: Vancouver, Canada

Using: Firefox (Desktop) 47.0, PageSpeed 1.15-gt1, YSlow 3.1.8

Looks like you're running WordPress
[Have a look at our WP optimization tips >](#)

Looks like you might not be using a CDN
[Why should I use a CDN? >](#)

Performance Scores

Page Details

PageSpeed Score

F (45%) ▾

YSlow Score

E (53%) ▾

Page Load Time

1.2s ^

Total Page Size

1.51MB ^

Requests

55 ^

PageSpeed

YSlow

Waterfall

Video

History

RECOMMENDATION

GRADE

TYPE

PRIORITY

▾ Enable gzip compression

F (0)



SERVER

HIGH

▾ Leverage browser caching

F (0)



SERVER

HIGH

▾ Minify CSS

F (0)



CSS

HIGH

▾ Optimize images

F (45)



IMAGES

HIGH

▾ Minify JavaScript

F (48)



JS

HIGH

▾ Defer parsing of JavaScript

D (62)



JS

HIGH

What do my scores mean?

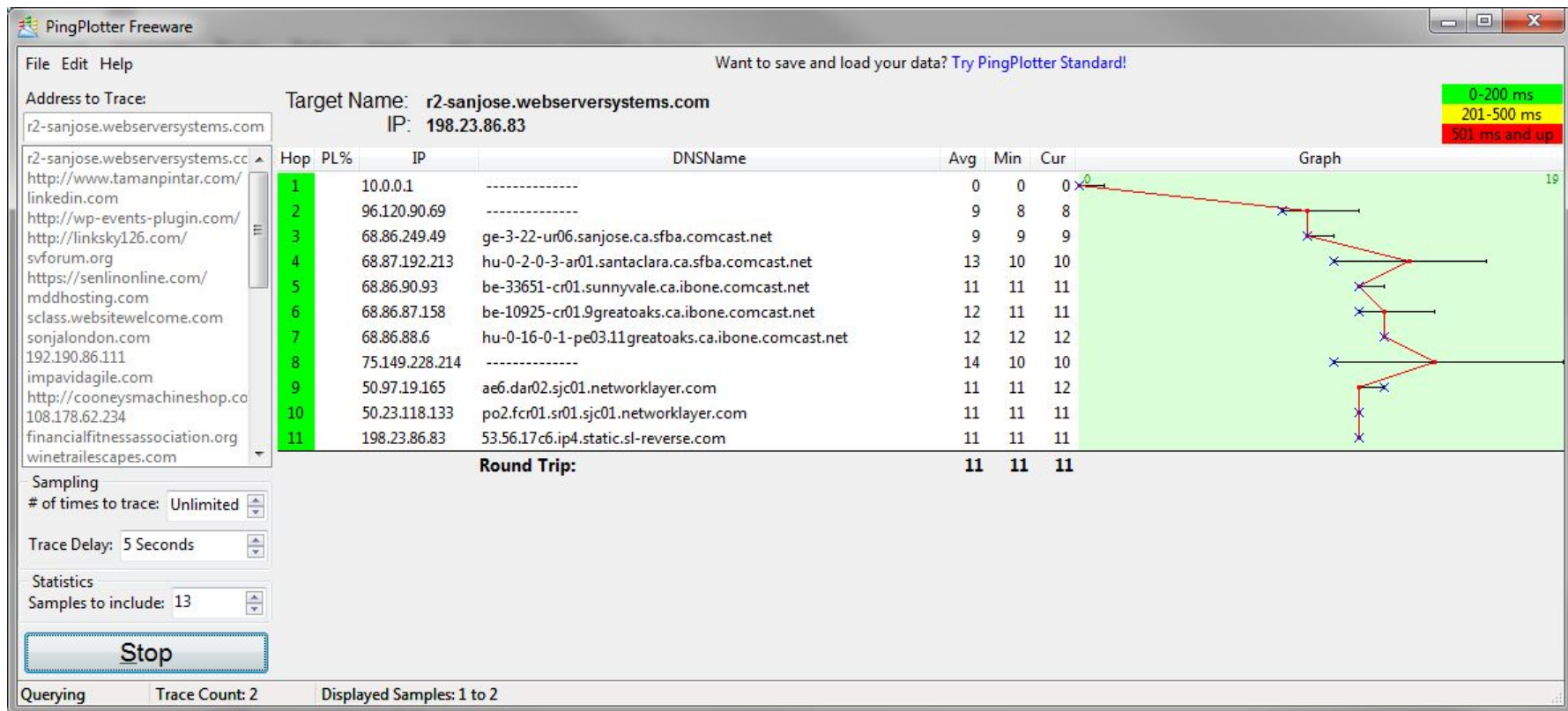
Rules are sorted in order of impact upon score

Optimizing rules at the top of the list can greatly improve your overall score.

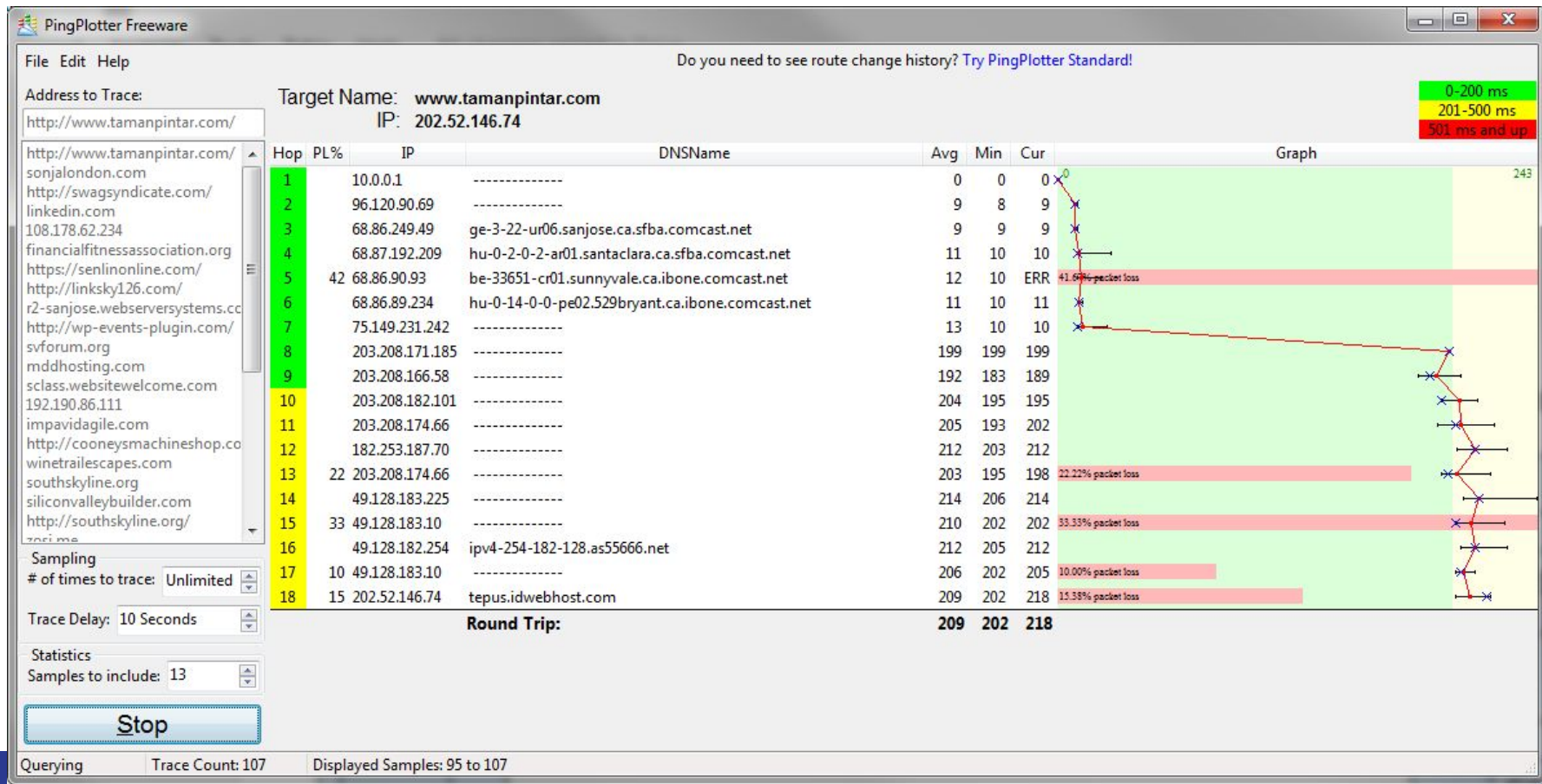
Not every recommendation will apply to your page

The recommendations are meant to be generic, best practices; some things will be out of your control (eg. external resources) or may not apply to your page.

Latency



Latency



Basics you should (almost) always do (mostly during setup/design)

1. Deliver only
 - a. what you need
 - b. when you need it
 - c. from where it should be
 - d. To the right audience
2. Make sure your clients do the same (avoid uploading giant image or PDF's)
3. Make sure your foundation supports your goals
4. Bake most of this into your dev cycle

The Host

Location, location, location

Popular != good

Overselling, Past record, does **EIG** own them or will it buy them?

Configuration?

- Memory
- SSD?
- CPU speed/cores

Who is really hosting you???

- Many excellent smaller hosts buy rackspace or racks from the big datacenters
- A few have built their own datacenters
- Takedowns? performance==0 & hard to fix

The Host

Shared - less expensive for low volume sites, but can perform very well IF you pick the right one

VPS - guaranteed portion (mostly) of computer

Dedicated - whole machine

Cloud - some portion of a larger number of machines (Amazon Web Services)

Managed - can be any of above and you must know what is “managed” -

- LAMP
- WP
- performance?

Plugins

I want a plugin that

1. slows down my site,
2. is not well supported,
3. is likely to be abandoned,
4. causes conflicts with other plugins
5. and destroys my design or functionality

[The discussion in WordPress LinkedIn group](#)

Plugins

How to leverage plugins for a well performing site

- Pick plugins that are well maintained
- Use plugins that do what you need, but do not do everything
- Periodically review & replace if need
- Test plugin performance
- Write your own lean plugins
- Rewrite a plugin to meet your needs
- “Just Say NO” - do not use a plugin where a few lines of CSS, PHP or other code will do

Plugins (some thoughts)

Test performance BEFORE & AFTER adding a plugin

Find plugins that are supported by multiple people &/or companies

Being on GitHub is a good sign

Instead of Yoast, consider SEO framework

Avoid page builders OR see Pippin Williamson's review if you absolutely must use one

That Mysterious Thing on the Back End - the Database

Pick the right engine(s) for your needs

- a. Transactions?
- b. Locking level?
- c. Maintainability?
- d. Index types?
- e. What is available on your installation/host ? (`mysql> SHOW ENGINES \G;`)

You may need more than one type of engine

That Mysterious Thing on the Back End - the Database

Engine	Support	Comment	Transactions	XA	Savepoints
PERFORMANCE_SCHEMA	YES	Performance Schema	NO	NO	NO
CSV	YES	CSV storage engine	NO	NO	NO
MyISAM	DEFAULT	MyISAM storage engine	NO	NO	NO
BLACKHOLE	YES	/dev/null storage engine (anything you write to it...	NO	NO	NO
MEMORY	YES	Hash based, stored in memory, useful for temporary...	NO	NO	NO
MRG_MYISAM	YES	Collection of identical MyISAM tables	NO	NO	NO
ARCHIVE	YES	Archive storage engine	NO	NO	NO
InnoDB	YES	Percona-XtraDB, Supports transactions, row-level l...	YES	YES	YES
FEDERATED	YES	Federated MySQL storage engine	NO	NO	NO

That Mysterious Thing on the Back End - the Database

Plugins

- May add tables
- Sometimes add tables badly (WordFence)
- May have bad defaults like excess logging (turn off what you don't need)

Know what tables your plugins add and decide how they are using them

That Mysterious Thing on the Back End - the Database

Develop design database

Know when to use abstraction layer (WP) or not

Consider Memory engine or transients where appropriate

Analyze queries & optimize them

Plan for the future one of our clients grew from 6k users to 60k in 2.5 years !

For really high end sites, consider HyperDB, database replication

That Mysterious Thing on the Back End - the Database

Maintain your database for peak performance

- Remove old data (revisions, transients, unused plugin tables)
- Reorganize or optimize periodically
 - **Plugins may help**
- Test database performance periodically
- Look at what queries are being run by whom (plugins, clients)
 - Just had a client submit a ticket that the database would not allow him to **create new tables so he could run ad hoc queries**
-

Caching

Store some items in final (HTML) form to lessen database access

Use a plugin - W3 Total Cache, WP Super Cache, WP Rocket, Hummingbird

Opcode cache (APC for PHP)

MemCache (server data like SQL queries)

Use a CDN (sort of like a super cache)

Browser caching via .htaccess

Caching (.htaccess)

```
## BEGIN LEVERAGE BROWSER CACHING ##  
<IfModule mod_expires.c>  
    ExpiresActive On  
    ExpiresByType image/jpg "access 1 year"  
    ExpiresByType image/jpeg "access 1 year"  
    ExpiresByType image/gif "access 1 year"  
    ExpiresByType image/png "access 1 year"  
    ExpiresByType text/css "access 1 month"  
    ExpiresByType application/pdf "access 1 month"  
    ExpiresByType application/x-javascript "access 1 month"  
    ExpiresByType application/javascript "access 1 month"  
    ExpiresByType application/x-shockwave-flash "access 1 month"  
    ExpiresByType image/x-icon "access 1 year"  
    ExpiresDefault "access 2 days"  
</IfModule>  
## END LEVERAGE BROWSER CACHING ##
```

Compression

Compress or minimize almost everything

Images - size for what is needed, use best compression format

- JPG for photos
- GIF for logos & artwork with small number of colors
- PNG has transparency

Minimize CSS (SASS) & JS during dev side compile

GZIP compression via .htaccess

Compression (.htaccess)

```
## BEGIN ENABLE GZIP COMPRESSION ##
```

```
<IfModule mod_deflate.c>
```

```
AddOutputFilterByType DEFLATE text/text text/html text/plain text/xml text/css application/x-javascript  
application/javascript
```

```
</IfModule>
```

```
## END ENABLE GZIP COMPRESSION ##
```

```
## BEGIN VARY ACCEPT ENCODING ##
```

```
<IfModule mod_headers.c>
```

```
<FilesMatch ".(js|css|xml|gz|html)$">
```

```
Header append Vary: Accept-Encoding
```

```
</FilesMatch>
```

```
</IfModule>
```

```
## END VARY ACCEPT ENCODING ##
```

Compression (.htaccess)

```
## BEGIN ENABLE GZIP COMPRESSION ##
```

```
<IfModule mod_filter.c>
```

```
  AddOutputFilterByType DEFLATE "application/atom+xml" \
```

```
    "application/javascript" \
```

```
    "application/json" \
```

```
    "application/ld+json" \
```

```
    "application/manifest+json" \
```

```
    "application/rdf+xml" \
```

```
    "application/rss+xml" \
```

```
    "application/schema+json" \
```

```
    "application/vnd.geo+json" \
```

```
    "application/vnd.ms-fontobject" \
```

```
    "application/x-font-ttf" \
```

```
    "application/x-javascript" \
```

```
    "application/x-web-app-manifest+json" \
```

```
    "application/xhtml+xml" \
```

```
    "application/xml" \
```

```
    "font/eot" \
```

```
    "font/opentype" \
```

```
    "image/bmp" \
```

```
    "image/svg+xml" \
```

```
    "image/vnd.microsoft.icon" \
```

```
    "image/x-icon" \
```

```
    "text/cache-manifest" \
```

```
    "text/css" \
```

```
    "text/html" \
```

```
    "text/javascript" \
```

```
    "text/plain" \
```

```
    "text/vcard" \
```

```
    "text/vnd.rim.location.xloc" \
```

```
    "text/vtt" \
```

```
    "text/x-component" \
```

```
    "text/x-cross-domain-policy" \
```

```
    "text/xml"
```

```
</IfModule>
```

```
## END ENABLE GZIP COMPRESSION ##
```

```
## BEGIN VARY ACCEPT ENCODING ##
```

```
<IfModule mod_headers.c>
```

```
  <FilesMatch ".(js|css|xml|gz|html)$">
```

```
    Header append Vary: Accept-Encoding
```

```
  </FilesMatch>
```

```
</IfModule>
```

```
## END VARY ACCEPT ENCODING ##
```

That Mysterious Thing Underneath - OS &

Linux/Apache

Nginx -

LiteSpeed

Microsoft - Friends don't let friends use Microsoft web servers

Tools

Uptime monitors - Monitor.us , Uptime Robot

Page Speed tests - GTMetrix, ySlow, Google, Pingdom

Database - [Query Monitor plugin](#), Debug Bar

Website - [Debug Bar plugin & addons](#) , [log deprecated notices](#)

Latency to front door - [Pingplotter](#)

.htaccess - <http://www.htaccess-guide.com/>

Load testing - [Apache Benchmark](#) , [curl loader](#), [Recent article \(check comments for more\)](#)

Questions?
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