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# Quick Facts About Michigan

- Michigan has the longest fresh water shoreline in the U.S. (world?) at 3,126 miles.

- Four flags have flown over Michigan: French, English, Spanish and U.S.

- Michigan is split into an "upper" and "lower" peninsula
  - The upper is dubbed the "U.P."

- Detroit, MI is called The "Motor City" in the U.S.
  - 1st mile of concrete road laid in 1909

- Detroit is the potato chip (crisp) capital of the world

# Notes About This Talk

- Lessons learned from MagentoLive Australia 2013
  - If masses walk out during the talk I have either:
  - A.   Miscalculated the technical level acceptable for the audience.
  - B.   Miscalculated my own ability to be interesting for 40 minutes.

- Lessons learned from MagentoLive UK 2013

Why Care About Performance and Security?

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# They Both Affect Your Bottom Line DIRECTLY!

# Anecdotal Notes on Performance

- Just think about it...

- slow….means….frustrating….

- Metrics aside - you know slow when you see it!

- There's rarely an upside to a site loading slow

  - Unless it's your competitors ☺

- Mobile adds a new variable (3G is essentially dial-up)

- An un-optimized Magento Enterprise is slow out-of-the-box

  - ~3 second load times are typical *before* adding extensions

# Performance Wins (Part 1)

- Firefox Browser
    - Slow page loaders downloaded less often
    - 1 second of increased performance increased downloads by 2.7%
- Shopzilla.com
    - Had page load times of ~7 seconds
    - 5 second decrease in page load time (7s → 2s)
    - 25% increase in page views
    - 7 – 12% *increase* in revenue
    - 50% *decrease* in physical hardware (and hardware costs)

# Performance Wins (Part 2)

- Google
  - Tested a longer page 1 (30 entries instead of 10) and found a 25% drop-off in clicks
  - The addition of a shopping cart icon:
    - Added 2% delay in loading
    - Resulted in 2% less searches/user
- Wal-Mart noted:
  - Every 1 second improvement equated to 2% increased CVR
  - Every 100 milliseconds improvement equated to 1% in incremental revenue

# Where to Start?

- Start simple – how does the site feel?
- Gather metrics
    - Web Page Test (http://www.webpagetest.org/)
    - Google Analytics
    - Yahoo's Yslow (browser plug-in)
    - New Relic & other paid tools
- Tackle one issue at a time, test, repeat
    - Big gains are possible with targeted optimization
    - Remember Pareto's Principal (the 80/20 rule)
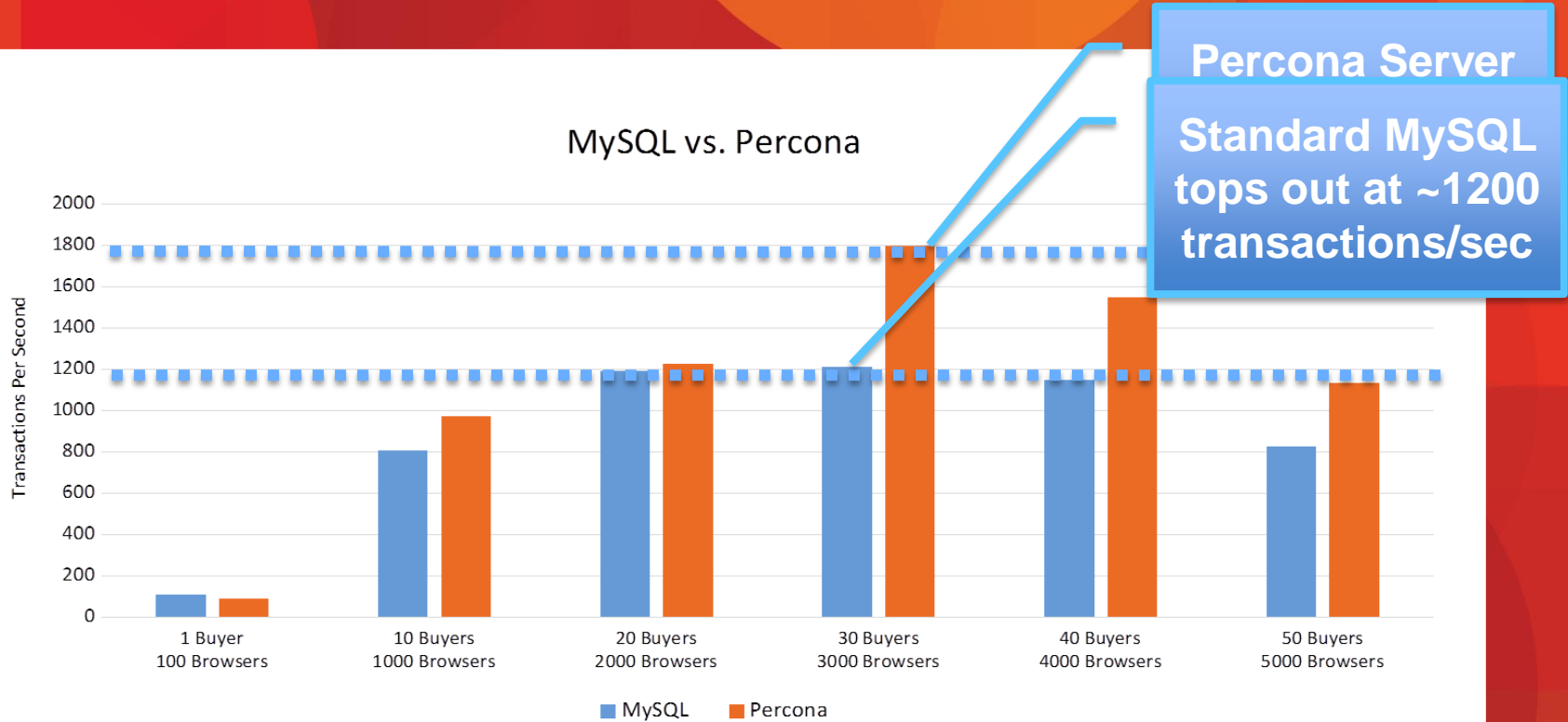    - *-- "80% of the effects come from 20% of the causes"*

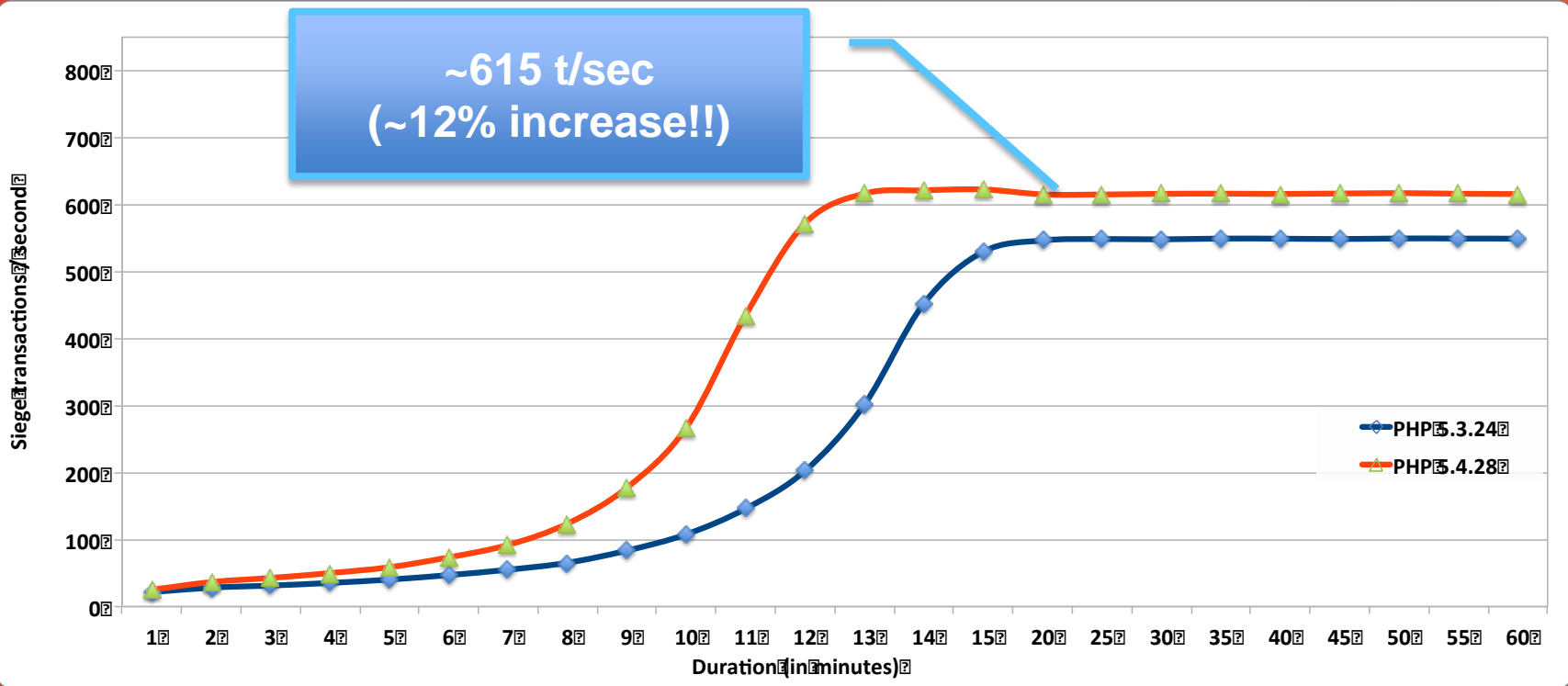# Performance Step #1 – Tune the Environment

# Tune the Environment

- Hardware and software choices matter!

- Choose a hosting provider that fits within your workflow and requirements.

- Ensure that your hosting provider:

    - Configures the PHP interpreter correctly (this runs Magento)

        - Uses PHP 5.4 if at all possible (patch may be required)

    - Configures the database server correctly (typically MySQL)

        - Uses Percona Server instead of MySQL

    - Implements the Magento best practices (at a minimum)

# Effect of Database Software Choice



MySQL vs. Percona

Percona Server

Standard MySQL tops out at ~1200 transactions/sec

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# Effect of PHP Software Choice #1



~615 t/sec
(~12% increase!!)

PHP 5.3.24
PHP 5.4.28

Siege transactions / second

Duration (in minutes)

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# Effect of PHP Software Choice #2



Even upgrading from 5.4.14 shows gains of ~4%

# Effect of PHP Software Choice #3



~781 t/sec
~25% better than 5.4
~41% better than 5.3
WOW ☺

PHP 5.4.28

PHP 5.5.12

Siege transactions / second

Duration (in minutes)
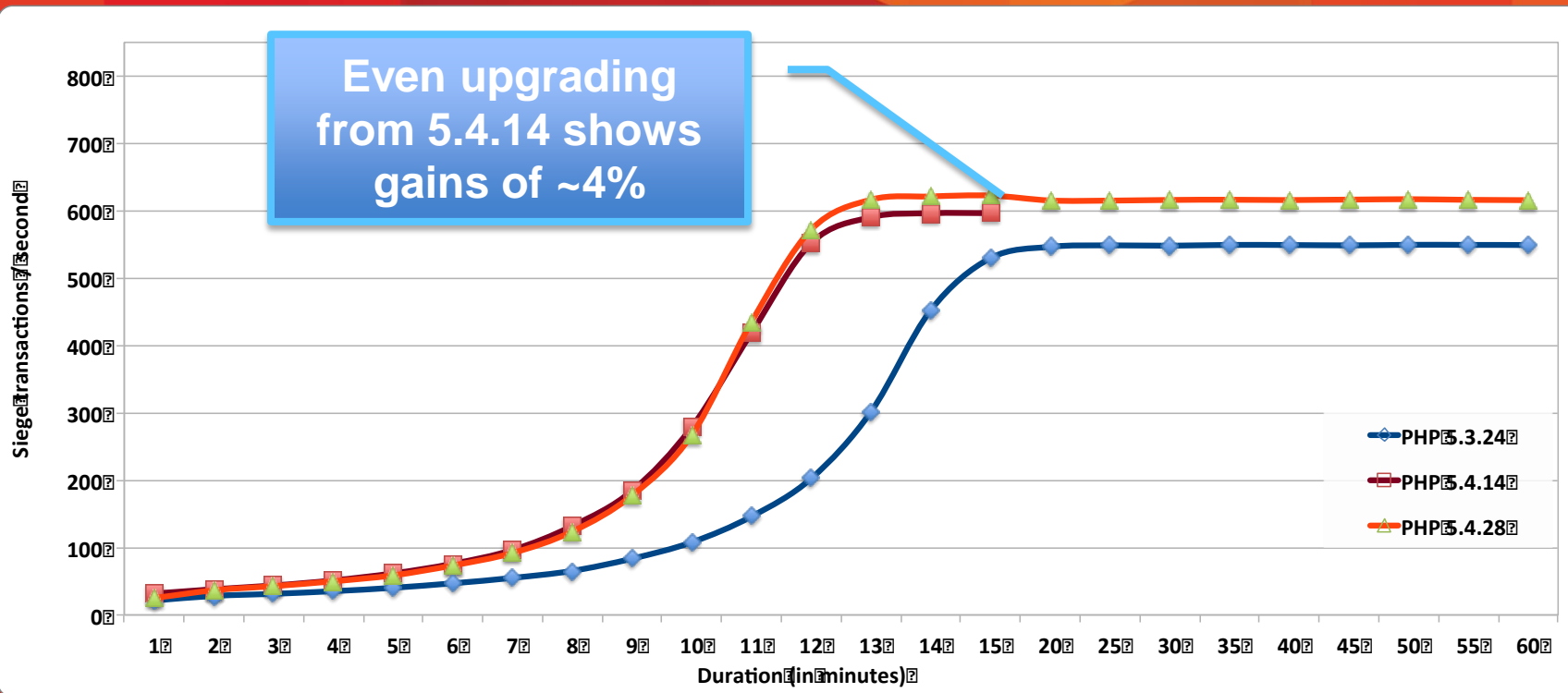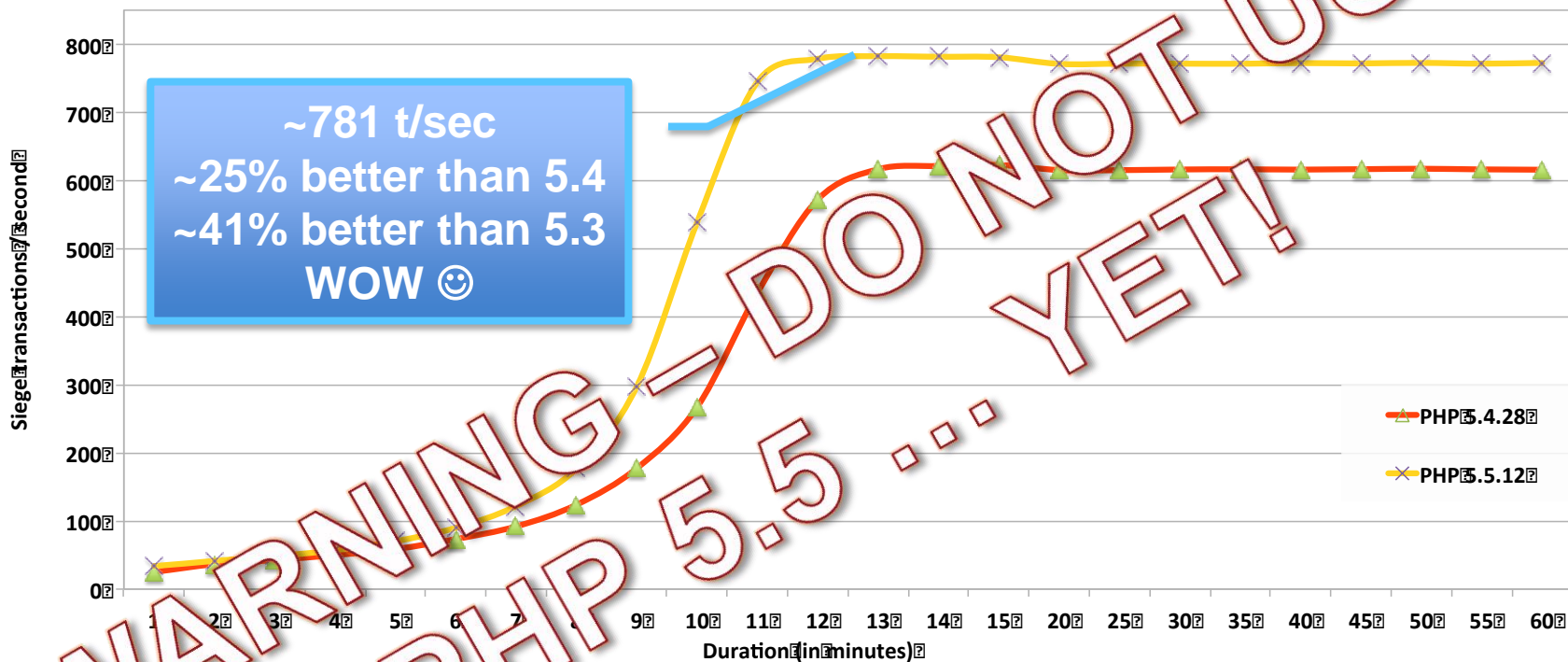
WARNING – DO NOT USE PHP 5.5 … YET!

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# Performance Step #2 – Tune Magento

# Notes on Magento

- Magento is **very** CPU heavy
  - The bulk of this heaviness is within PHP code
  - MySQL CPU usage is typically bound by PHP's CPU usage (speaking in single server terms)
- Magento is **not** very I/O heavy
  - I know, I know this sounds like heresy – I'll explain
  - I/O is bound by PHP's CPU usage
- PHP is often the bottleneck!

# Tune Magento

- Make full use of Magento's built-in features!
- The two-level memory-based cache
- Session memory-based caching
- The Magento memory-based full page cache (FPC)
  - HUGE performance gains instantly
  - 1.13+ has smarter cache invalidation than prior versions
- 1.14+ supports PHP 5.4 out of the box
- Use available domain-based optimizations (SOLR, etc)

# Performance Step #3 – Tune The Edge

# Tune the Edge

- Host where your customers are
  - Put your site on the same continent as your audience (or closer)
- Use a global content delivery network (CDN)
  - 75% of all e-commerce sites **do not** use a CDN
- Turn on compression for JavaScript, CSS, HTML, images, etc
  - 22% of all e-commerce sites **do not** use compression
- Turn on HTTP Keep-alives (keeps per-client connections open)
  - 13% of all e-commerce sites **do not** use the keep-alive setting
- Beware of too many (or just plain bad) external resources (JavaScript, CSS, images, ads  and other external assets)

# Performance Step #4 – Extensions…

# Extension Choices Matter

- Make use of **good** 3rd party extensions
  - You have to define "good"
- Beware of **bad** 3rd party extensions
  - May induce slowness (complex or non-optimal queries)
  - May include slow off-server content
  - Test all extensions for performance before using in production!
  - Don't assume that 3rd party developers have tested for performance
- Strike a usability balance between performance and features

# Bringing It All Together

# TTFB (Time to First Byte)



Not a great start…

Ignore these for now.
Remember - one thing at a time!

| | First Byte Time | Keep-alive Enabled | Compress Transfer | Compress Images | Cache static content | Effective use of CDN |
|---|---|---|---|---|---|---|
| | F | F | F | C | A | X |

We're at about 3 seconds to start

| | Load Time | First Byte | Start Render | Speed Index | DOM Elements | Time | Requests | Bytes In | Time | Requests | Bytes In |
|---|---|---|---|---|---|---|---|---|---|---|---|
| First View | 2.847s | 0.766s | 2.077s | 2519 | 518 | 2.847s | 43 | 518 KB | 3.034s | 44 | 519 KB |
| Repeat View | 1.025s | 0.750s | 0.935s | 978 | 518 | 1.025s | 2 | 57 KB | 1.025s | 2 | 57 KB |

BUT… Repeat views are not bad!

# The Power of the Full Page Cache

**From "F" to "B" with a single config change**

| B | F | F | C | A | X |
|---|---|---|---|---|---|
| First Byte Time | Keep-alive Enabled | Compress Transfer | Compress Images | Cache static content | Effective use of CDN |
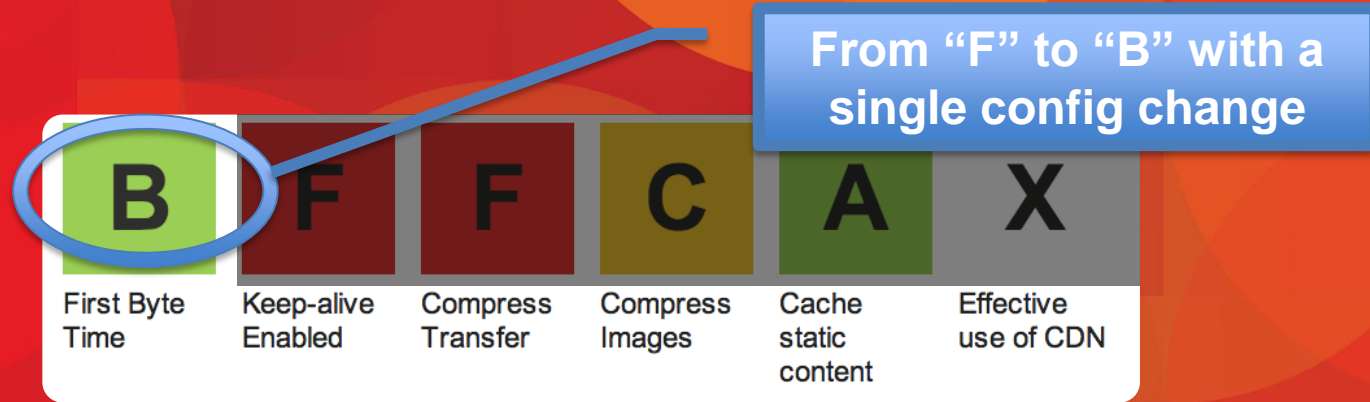
**And we've gained a full ½ second (was 2.8)**

| | Load Time | First Byte | Start Render | Speed Index | DOM Elements | Document Complete | | | Fully Loaded | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Time | Requests | Bytes In | Time | Requests | Bytes In |
| First View | 2.338s | 0.356s | 1.644s | 1993 | 517 | 2.338s | 43 | 519 KB | 2.542s | 44 | 520 KB |
| Repeat View | 0.601s | 0.313s | 0.454s | 591 | 517 | 0.601s | 2 | 58 KB | 0.601s | 2 | 58 KB |

**Repeat page**

**TTFB is only .36 seconds! (was .75) (was ~1)**

# Edge Tuning

**Simple server-side changes make these perform**

**CDN configured**

...ession ... e by ... team

| B | A | A | C | A | ✓ |
|---|---|---|---|---|---|

First Byte Time    Keep-alive Enabled    Compress Transfer    Compress Images    Cache static content    Effective use of CDN
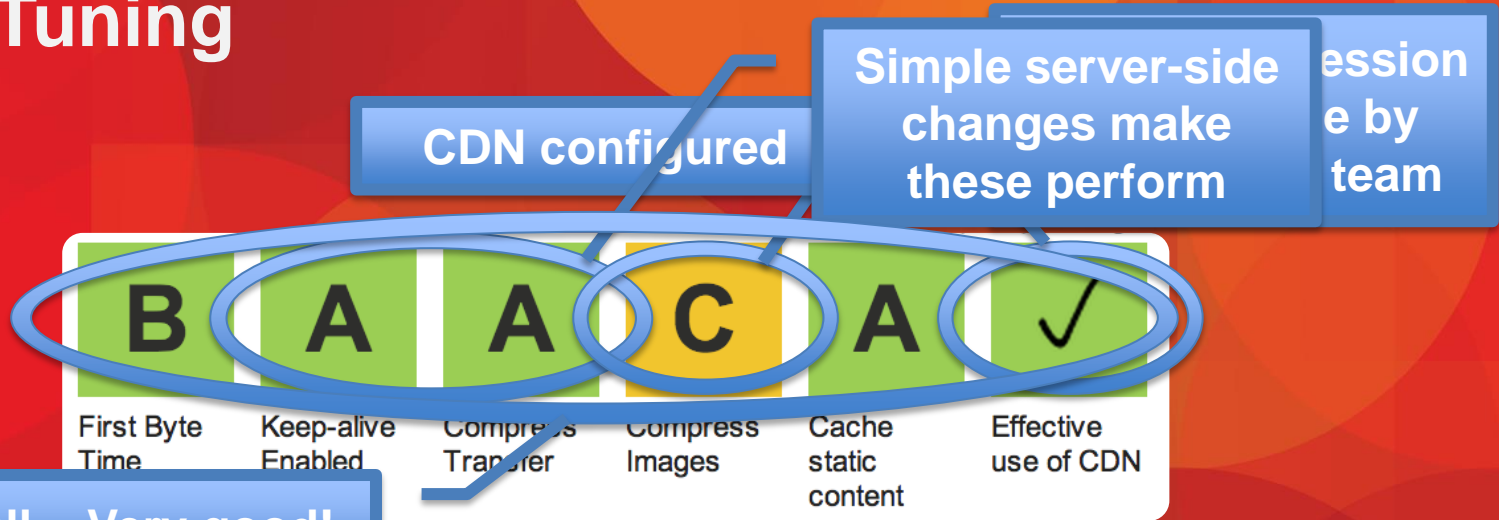
**Overall – Very good!**

**We've gained another full second (was 2.4)**

|  | Load Time | First Byte | Start Render | Speed Index | DOM Elements | Time | Requests | Bytes In | Time | Requests | Bytes In |
|---|---|---|---|---|---|---|---|---|---|---|---|
| First View | 1.157s | 0.384s | 0.876s | 981 | 517 | 1.157s | 44 | 172 KB | 1.195s | 44 | 173 KB |
| Repeat View | 0.593s | 0.335s | 0.472s | 591 | 517 | 0.593s | 2 | 21 KB | 0.593s | 2 | 21 KB |

**TTFB largely unaffected (as expected)**

The...

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# Turpentine/Varnish Caching & Response Time



Response Time

Page Load Time in Seconds

**Turpentine can cut this down quite a bit!**

**FPC yields ~.5 second page load times (under optimal conditions)**

Time in minutes

With FPC    Varnish / Turpentine
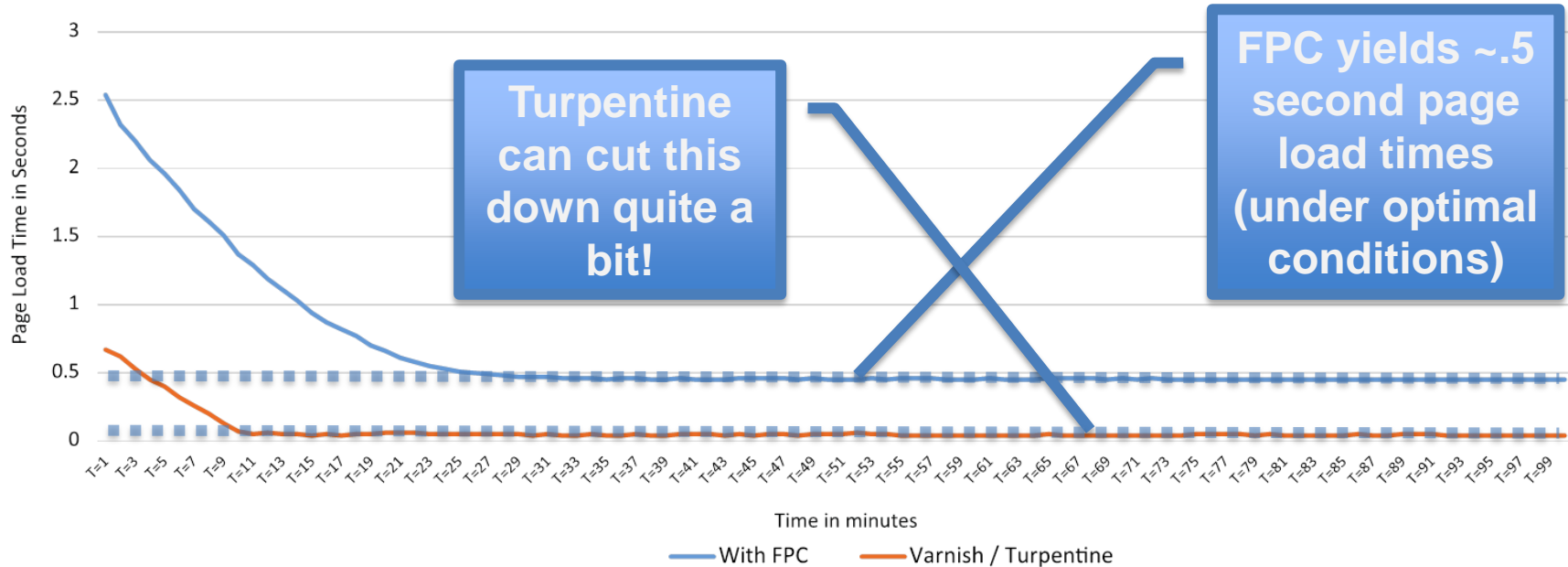
# Adding Nexcess/Turpentine

**From "B" to "A" with a single free extension**

| A | A | A | C | A | ✓ |
|---|---|---|---|---|---|
| First Byte Time | Keep-alive Enabled | Compress Transfer | Compress Images | Cache static content | Effective use of CDN |
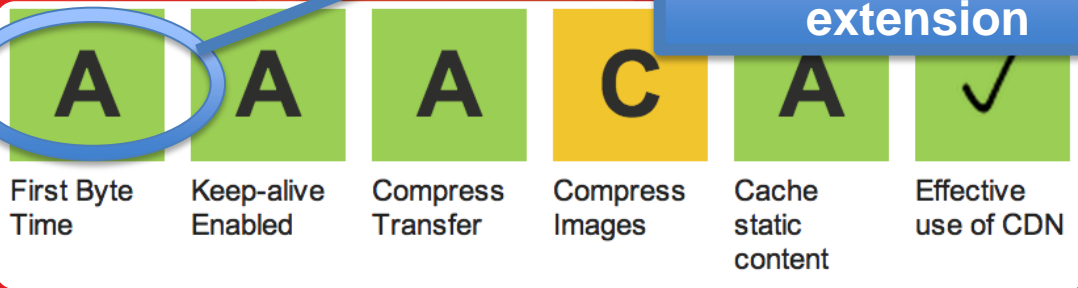
**Down to almost 1 second!**

| | Load Time | First Byte | Start Render | Speed Index | DOM Elements | Time | Requests | Bytes In | Time | Requests | Bytes In |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **...t Complete** | | | **Fully Loaded** | | |
| First View | 1.090s | 0.200s | 0.692s | 830 | 520 | 1.090s | 46 | 174 KB | 1.127s | 46 | 175 KB |
| Repeat View | 0.590s | 0.176s | 0.471s | 539 | 520 | 0.590s | 4 | 22 KB | 0.761s | 4 | 23 KB |

**Even wi... variance**

**Our lowest TTFB yet! (was .38)**

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# On to Security!

# Security Reality Check

- Security is costly
  - Maintaining a high level of security takes effort
  - Breaches cause a loss of customer goodwill
  - Breaches absorb time/energy that could be spent more profitably
- Security is hard
  - It's like dieting…
- Security is multi-faceted
  - Many key players with diverse responsibilities
- Security never ends
  - There are no diet breaks ☹

Security Step #1 – Secure the Environment

# Security Step #2 – Secure Magento

# Basic Magento Security

- Keep Magento up to date
  - I know I know – easier said than done … but do it
- Maintain unique user accounts per user
  - This is also a PCI requirement!
- Use a unique admin URL
- Require SSL (network encryption)
- Restrict admin access to known allowed IP addresses
- Extensions add new variables – don't ignore them!

# Security Step #3 – Secure Your Workflow

# Basic Security

- Password security
  - Passwords **_do not necessarily_** need to be complex
  - PillowCarpetTelevision ← 22 characters!
  - Don't reuse passwords on other sites
  - Use LastPass (or something like it)
- Use a secure means to publish content
  - Avoid FTP!
- Ensure backups exist (and are recent)
- Trust but verify your hosting arrangements

Performance and Security are NOT spectator sports!

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# Thank You!!

P.S. I had a bag of chips for each audience member but I ate them all because I'm from Detroit ☹.

Sorry…

But not really…

Sorry that is.

# References

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- http://programming.oreilly.com/2009/07/velocity-making-your-site-fast.html