

Bonus Content

Website Latency & Web Testing/Benchmarking Tools



Cloud Computing
Paul Talaga



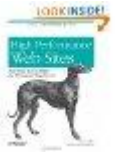
Why Benchmarking/Testing?

- Web services (sites) need testing too!
- Customer experience is king. (<300ms)
- Questions:
 - How fast is server X vs Y?
 - Which pages have the highest latency?
 - Could a user get 'stuck' in my app?
 - Do all my app paths work?
 - Browser rendering differences?
 - Network connectivity issues?
 - Do all users experience the same latency?
 - Where are my infrastructure weak points?

Website Latency

- Customer's perception of site related to page load time. Better perception -> \$\$
- Acceptable values
 - Full page SHOULD load < 3s
 - < 300ms optimal ([NYTimes](#))
 - 1s extra -> \$1.6B lost sales at Amazon ([link](#))
- Where does latency come from?
 - DNS
 - Physical distance
 - HTML delivery
 - HTTP header/data size
 - Extra content download (CSS, JS, Images)

Optimization Techniques



- DNS - Minimize DNS lookups
- Minimize distance from user to server
- Provide HTML as fast as possible <300ms
- Optimize images
- Set [expire headers](#) for images/css/statics
- Use a CDN for static content
- Use correct HTML & be [W3C](#) compliant
- Enable gzip compression
- Stylesteets on top, scripts at bottom
- Make CSS/JS external
- Minify javascript



New Technology

- HTTP Pipelining - FIFO queue 1 TCP link
- More Browser TCP connection ->6
- Google SPDY - new networking protocol
 - New layer between HTTP & TCP/SSL
 - Multiplexing, compression, caching
 - Claims up to 64% faster load times
 - Servers can hint or push content
 - Chrome/Chromium, Firefox, Opera, IE 11
 - In April 2013, 1% servers support, Jan 2014 0.6% - To be retired in 2016
- HTTP/2 taking its place! ([ref](#))

Benchmarking Tools

- Different tools - different purposes
 - Google Chrome -> Developer Tools
 - ab - request the same URL in parallel for many requests
 - [Apache Jmeter](#) - Write a 'program' to navigate a site - spawn many clients/threads
 - not a browser! No Javascript :-(
 - Test website backed
 - [Selenium](#) - Programmatically tell a browser what to do. Test Javascript!
 - Test website frontend

ab - Apache Bench

- Basic latency information for a page
- Features:
 - Concurrency (multiple simultaneous users)
 - Cookie support
 - HTTP Authentication support
 - SSL/TLS support
 - Individual requests or HTTP [KeepAlive](#)
 - GET or PUT requests
 - Export capability:
 - Screen
 - HTML Table
 - CSV or GnuPlot file

Apache Jmeter

- Can build and run a testing script
- Iterate many times, and in parallel
- Like `ab`, but can jump from page to page
- Can *analyze* retrieved content and impact the next request
- Good graphing & analysis features
- Supports: HTTP/HTTPS, FTP, POP3, MongoDB, Shell scripts, TCP