# Faster Programs = Happier Users

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# Who Am I?

* David McKinnis
  * Co-Founder, CTO of SureTech.com

BTI 5000

Apple II

Macintosh

Mac Word 4.0

Windows 1.x

Word for Windows 1.0

Windows 3.x

Mac Word 5.0

Mac Word 6.0

Office 95

Windows Installer

Office 2000

PHP

MySQL

iPhone

# If I am successful

* You will have some new tools in your toolbox:
  * Tools to measure performance
  * Strategies to improve performance
* You will teach me something

# Fast Applications Take Effort

* Blaise Pascal

  I would have written a shorter letter, but I did not have the time.

* Everything is working to slow things down–
  * New Features
  * Every new line of code

# Example #1
# SureTech.com

# Why Performance is Important

* It affects how people view your application
* It affects how many people run your application
* It affects how people view your company
* It affects your success

# The Process for Making Performance Improvements

1. Decide what scenarios to look at
2. Measure a scenario
3. Decide which scenarios are too slow
4. Figure out what's slowing you down
5. Make some changes that should improve it
6. Measure again
7. If there's no change, remove your fixes – they are most likely buggier than what was there before.

# How do you decide what to work on?

* What scenarios are important to your users (or you)?
* Identify a few key ones (to start with)
* Listen to complaints from your users
* Find areas that aren't being used as you would expect
* Time those and see which ones are too slow
* Periodically go back and notice if there are significant increases

# Scenarios Looked At

* Loading home page with empty cache
* Loading home page with full cache

# How do you measure performance

* Think about the whole scenario – beginning to end. What does the user see or perceive?
* Understand who your users are and what they are trying to do
* Understand the conditions under which your users use your product
* Clearly define hardware, setup and initial conditions (make sure you can recreate those later)

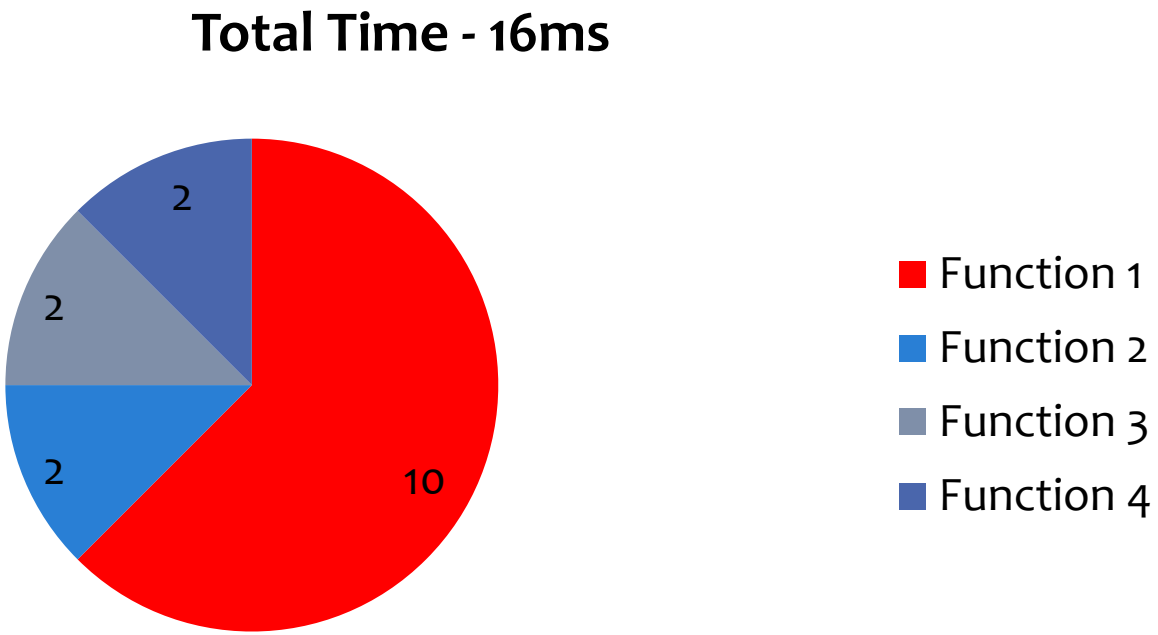
# Tools I Used

* FireBug
* YSlow
* FIddler

# What I Discovered

* Multiple JS and CSS files
* Nothing cached on the client side
* Lots of graphics and a video being loaded

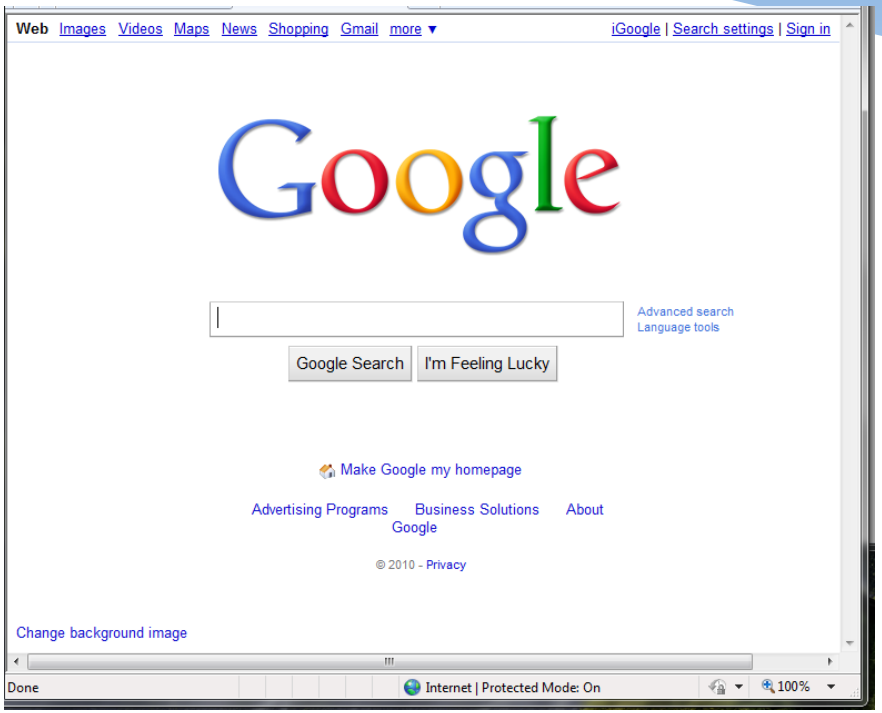
# Which Part Do You Work On?



# Five Ways to Improve Speed

* Do Less work
* Do things at a different time or place
* Don’t repeat work
* Make your code more efficient
* Increase the capacity of your hardware

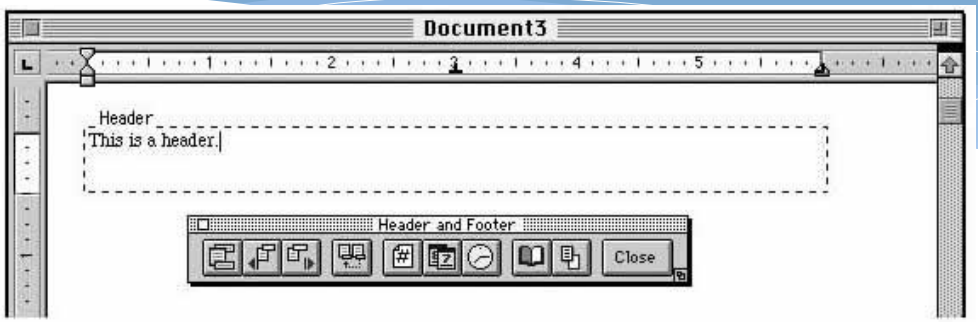
# Doing Less
# Google.com vs SureTech.com




# Improvements

* Use Apache settings to cache on the client side
  * Don’t repeat work
* Combine and compress CSS and JS files
  * Increase the capacity of your hardware
  * Don’t repeat work

# Example #2
# Mac Word 6 & Word 95




# Scenarios Looked At

* Mac Word 6.0
  * Layout
  * Boot
  * Find
* Word 95
  * Boot

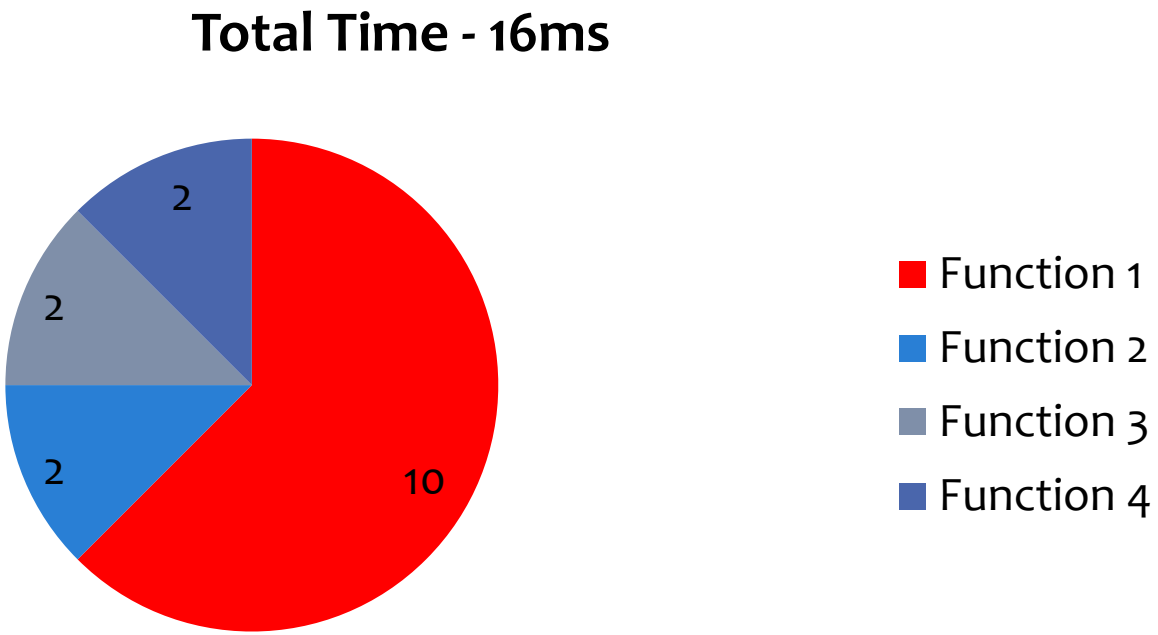
# Tools to Measure Performance

* Stop Watch
* C Language Profiler

# Profilers

* Should show you
  * How many times a function is called
  * How much time that function takes
  * How much time that function and it's children take
* Helps to find bugs
* Various types of profilers
  * Code profilers in your development environment
  * Client-side profilers like YSlow or Firebug

# Which Part Do You Work On?



# Problems Found and Changes Made

* Find
  * Too many calls to check for user cancelling
  * Solution - Stop polling the user so frequently
* Layout
  * Time critical portion of program
  * Solution – Hand written assembly language code
* Boot speed Mac Word
  * Font enumeration taking too long
  * Solution – Cache font information and reuse if possible

# Problems Found and Changes Made (part 2)

* Boot speed in Word 95
  * Splash screen slowing down boot
  * Solution – Cache bitmap of splash screen so calculations aren't repeated

# Example #3
# GoCrossCampus.com

# Problems Found

* Usage was not evenly distributed
* Creation of map data was exceptionally slow
* Queries to give users feedback on battle outcomes were extremely complex and slow
* Slow response caused users to repeat their requests (which just slowed things down more)

# Solutions

* Created separate MySQL server
* Moved emailing function to separate server
* Moved chat function to separate server
* Moved static items to separate server
* Cached results of complex queries
  * Stored in the database
* Cached map data on a regular basis
  * Using memcached

# Any Additional Questions?

# Useful Resources

* Webpage Tools (in no particular order)
  * FireBug http://getfirebug.com/ (for FireFox)
  * YSlow http://developer.yahoo.com/yslow/ (for FireFox)
  * Fiddler http://www.fiddler2.com/fiddler2/
  * Developer Tools in IE8 (F12)
* PHP Tools
  * Xdebug - http://xdebug.org/ - for profiling
  * APC - Alternative PHP Cache – PHP Accelerator
  * XCache - PHP Accelerator

# Interesting Reading

* Building Scalable Websites by Cal Henderson (a bit dated, but the basics are still solid)
* Raymond Chen's blog I believe interesting even for non-Windows programmers - http://blogs.msdn.com/b/oldnewthing. This article in particular - http://blogs.msdn.com/b/oldnewthing/archive/2010/11/04/10085797.aspx talks about taking into account performance when designing a feature.