

Introduction to Computer Networks

The Future of HTTP



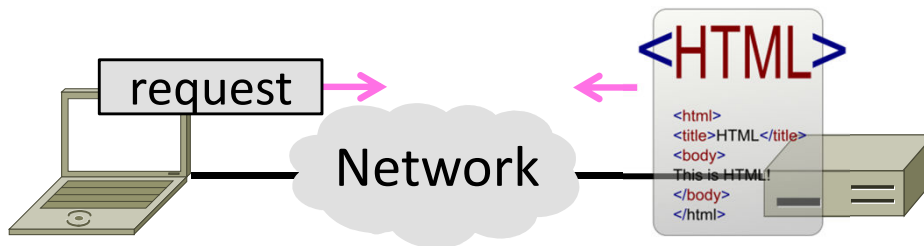
David Wetherall (djw@uw.edu)

Professor of Computer Science & Engineering

UNIVERSITY *of* WASHINGTON

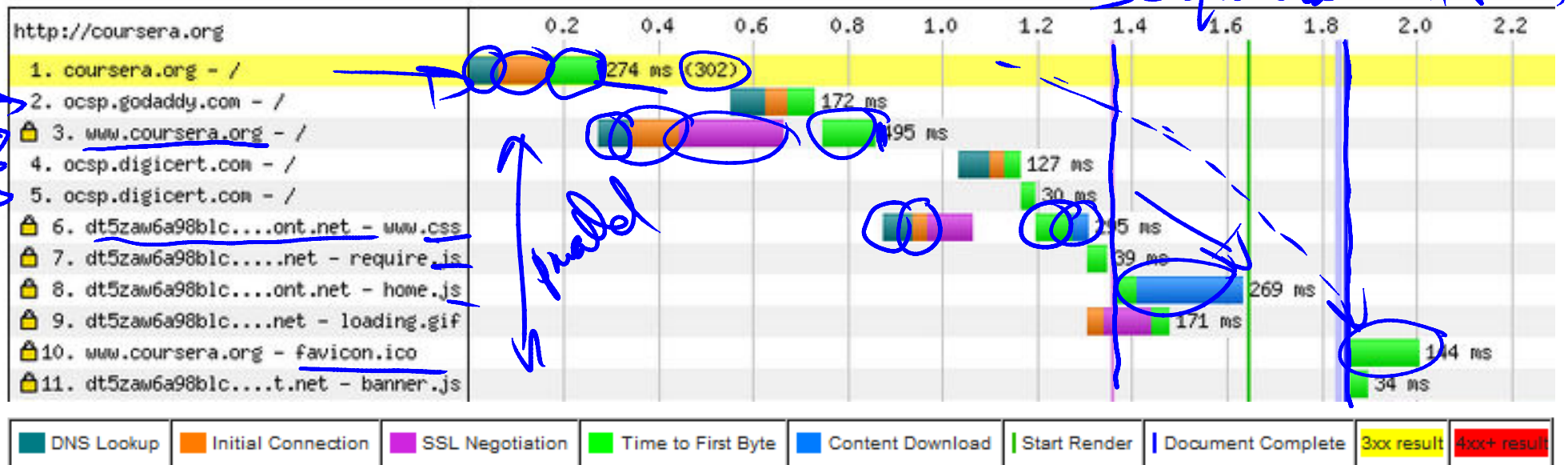
Topic

- The Future of HTTP
 - How will we make the web faster?
 - A brief look at some approaches



Modern Web Pages

- Waterfall diagram shows progression of page load



webpagetest tool for http://coursera.org (Firefox, 5/1 Mbps, from VA, 3/1/13)

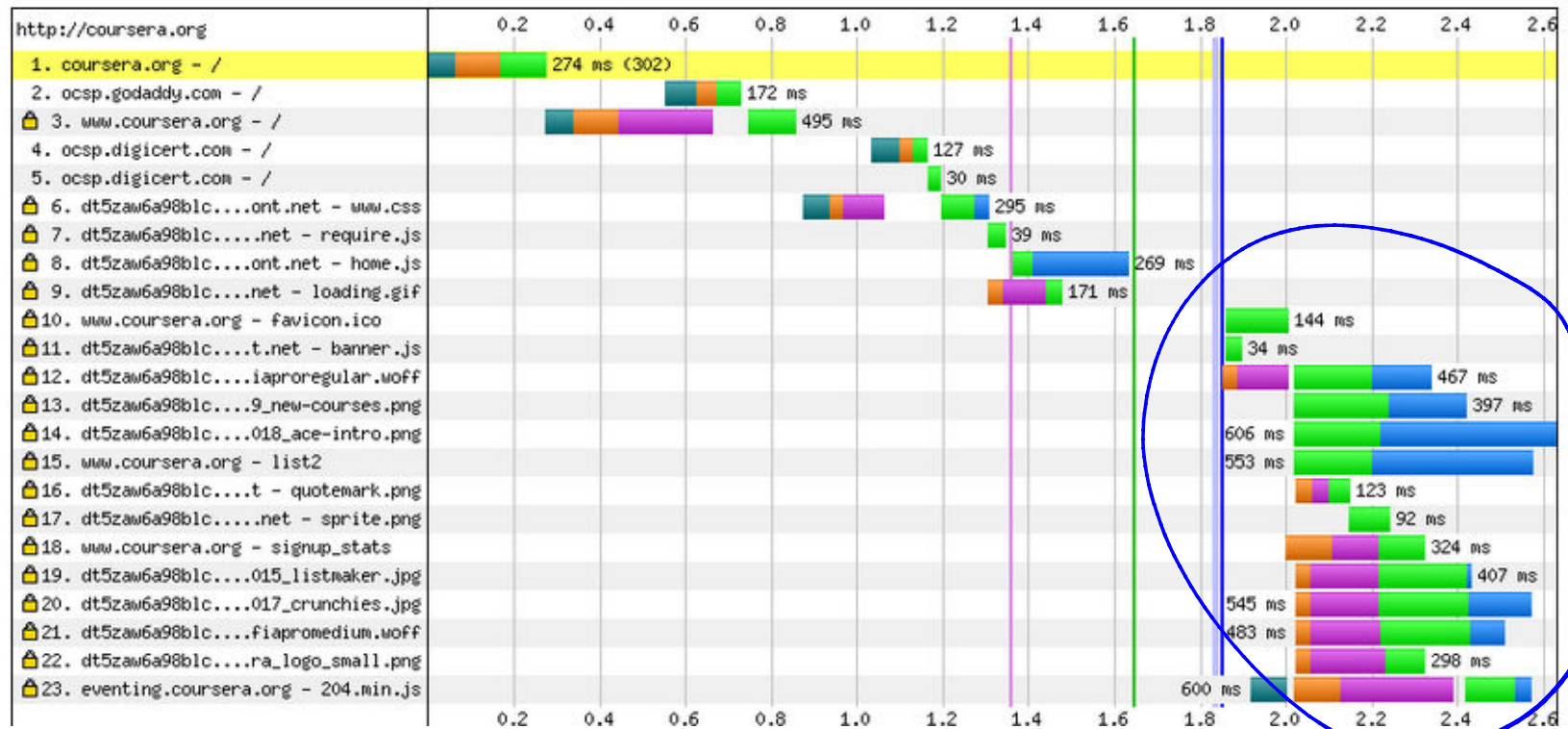
Modern Web Pages (2)

Yikes!

-23 requests

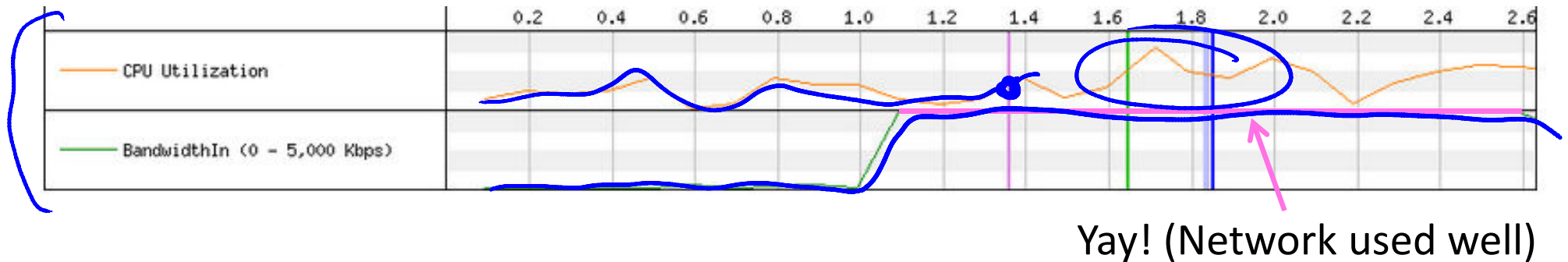
-1 Mb data

-2.6 secs



webpagetest tool for `http://coursera.org` (Firefox, 5/1 Mbps, from VA, 3/1/13)

Modern Web Pages (3)



- Waterfall and PLT depends on many factors
 - Very different for different browsers
 - Very different for repeat page views
 - Depends on local computation as well as network

Recent work to reduce PLT

Pages grow ever more complex!

- Larger, more dynamic, and secure
- How will we reduce PLT?

1. Better use of the network

- HTTP/2 effort based on SPDY

2. Better content structures

- mod_pagespeed server extension

SPDY (“speedy”)

- A set of HTTP improvements
 - ✓ Multiplexed (parallel) HTTP requests on one TCP connection
 - ✓ Client priorities for parallel requests
 - ✓ Compressed HTTP headers
 - ✓ Server push of resources
- Now being tested and improved
 - Default in Chrome, Firefox
 - Basis for an HTTP/2 effort

mod_pagespeed

- Observation:






- The way pages are written affects how quickly they load

➔ Many books on best practices for page authors and developers

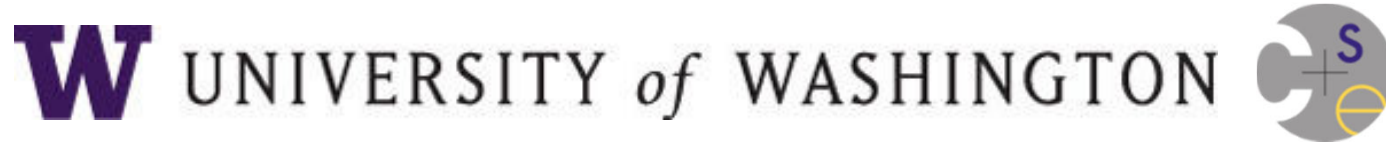
- Key idea:

- Have server re-write (compile) pages to help them load quickly!
- mod_pagespeed is an example

mod_pagespeed (2)

-  Apache server extension
 - Software installed with web server
 - Rewrites pages “on the fly” with rules based on best practices
- Example rewrite rules:
 -  Minify Javascript
 -  Flatten multi-level CSS files
 -  Resize images for client
 -  And much more (100s of specific rules)

END



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