Computer Networks

The Future of HTTP

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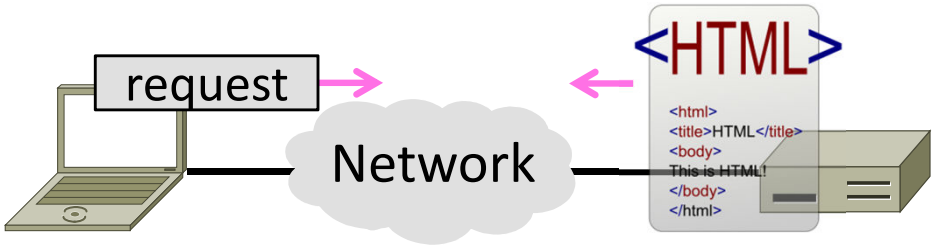
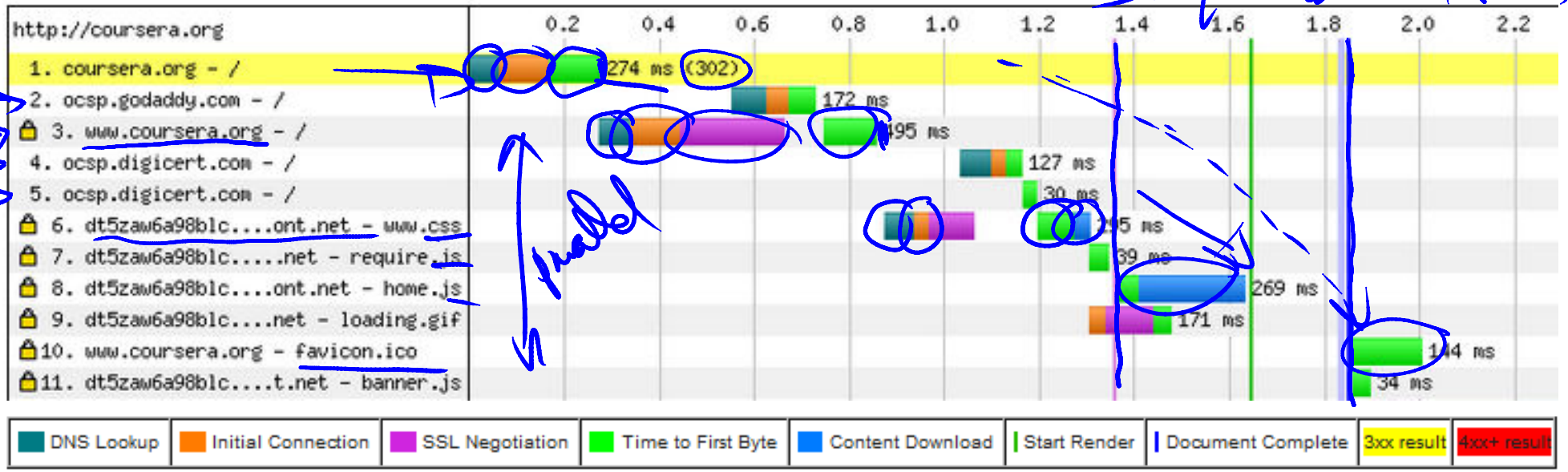
Topic

- 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)

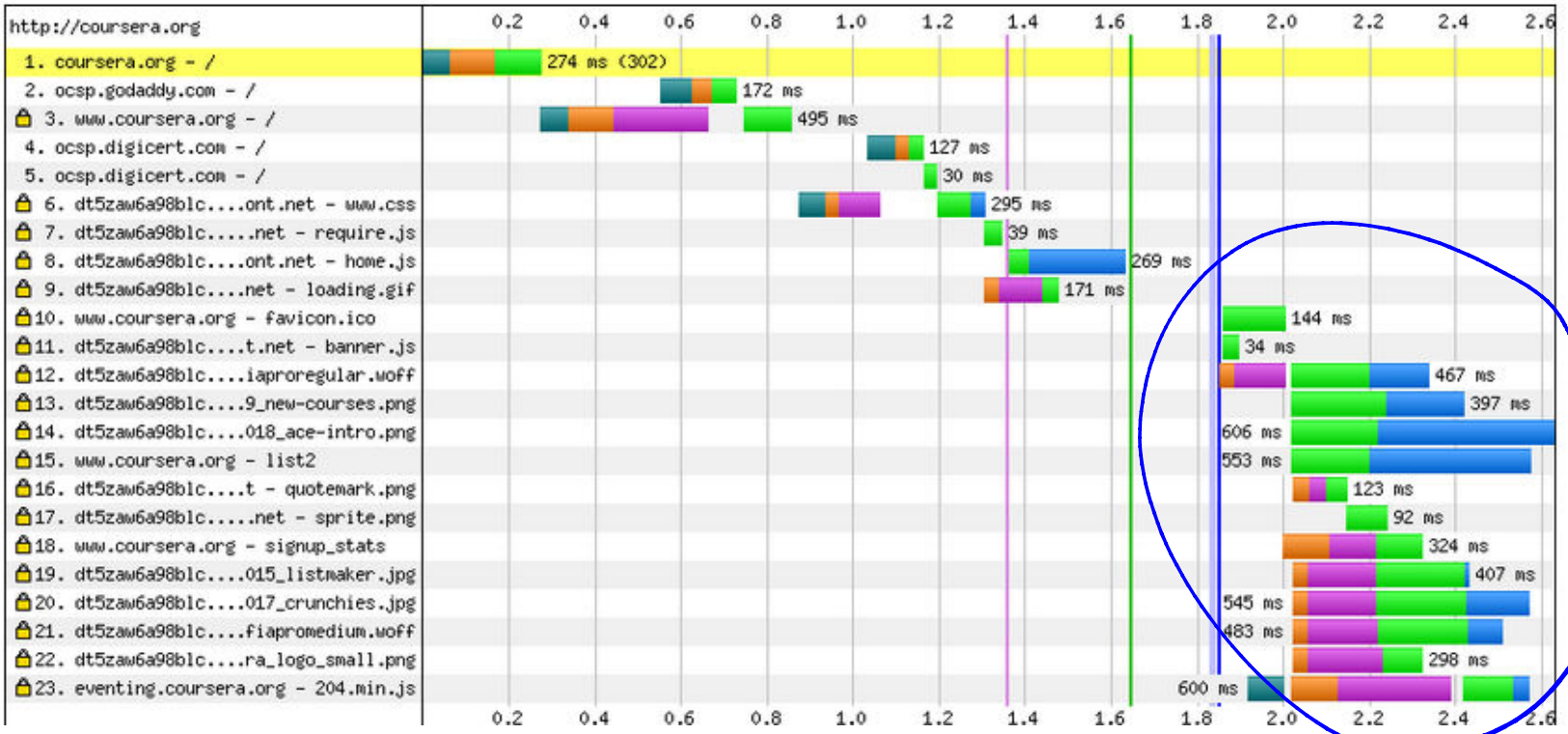
Modern Web Pages (2)

Yikes!

-23 requests

-1 Mb data

-2.6 secs



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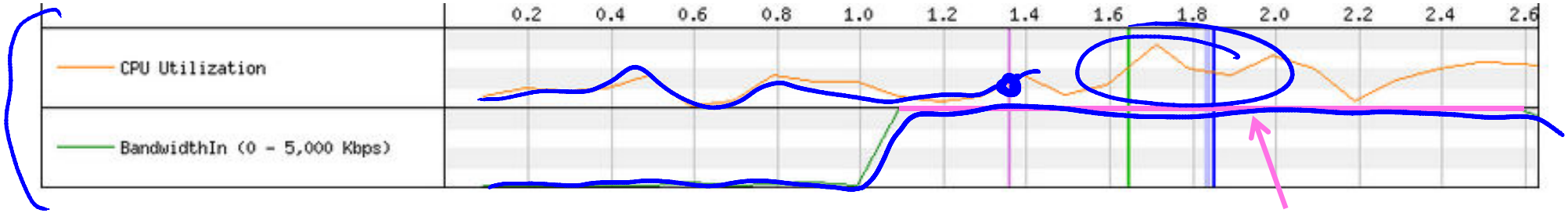
Modern Web Pages (3)



Yay! (Network used well)

- 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