

SPDY

Denny Lin

4 March 2015

Overview

Site	Average Gain in ToW (SPDY over HTTPS)
Facebook	7.0%
Google	-20.2%
YouTube	4.7%
Blogspot	-6.0%
Twitter	10.6%
WordPress	-15.1%
imgur	0.8%
youm7	9.7%

Network effects

- ▶ Website classification:
 - ▶ Small: Google, Twitter
 - ▶ Medium: YouTube, Wikipedia
 - ▶ Large: CNN, Amazon
- ▶ Network parameters:
 - ▶ RTT
 - ▶ Bandwidth
 - ▶ Packet loss

Network effects - RTT

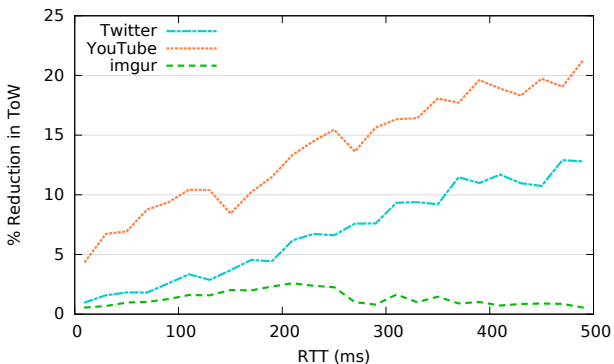


Figure: BW = 1 Mbps, PL = 0%.

Network effects - Bandwidth

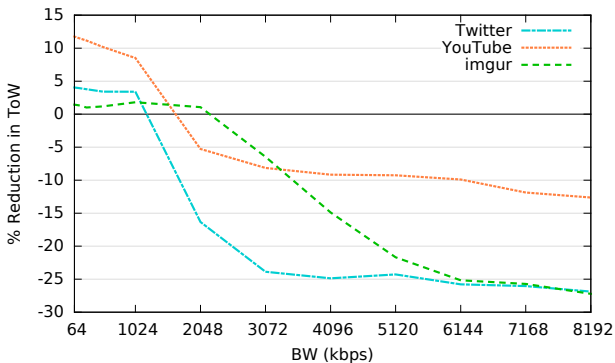


Figure: RTT = 150 ms, PL = 0%.

Network effects - Packet loss

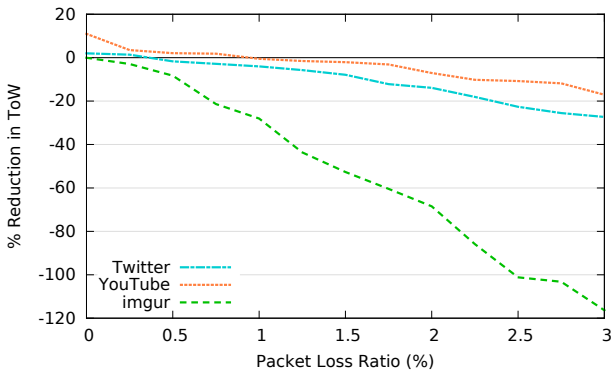
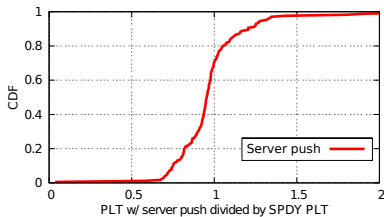


Figure: RTT = 150 ms, BW = 1 Mbps.

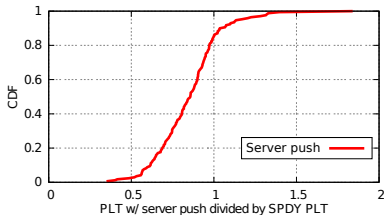
Web page characteristics

- ▶ Characteristics of top 200 Alexa web pages:
 - ▶ Median page size: 750 KB
 - ▶ Median number of objects: 30
 - ▶ Median object size: 17 KB

Web page characteristics - Dependencies



(a) RTT = 20 ms, BW = 10 Mbps



(b) RTT = 200 ms, BW = 10 Mbps

Figure: Effect of server push.

Status of SPDY

- ▶ 2.7% of top 10K websites supported SPDY in April 2013
- ▶ Deployed by Google, Twitter, Facebook, etc.
- ▶ Successful due to its ease of deployment
- ▶ Basis for HTTP/2

Summary - Features

	Result
Multiplexed streams	Low BW & PL, High BW & PL
Optimized data transfer	Low BW
Prioritization	Ineffective
Server push	High RTT

Summary - Environments

	RTT	Bandwidth	Packet loss
Wired	Low	High	Low
WiFi	Med	Med	Med
Mobile	High	Low	High

Web page characteristics - Objects

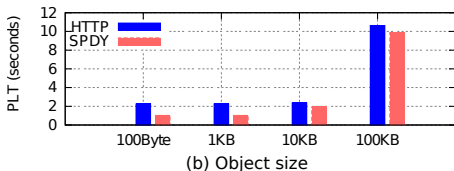
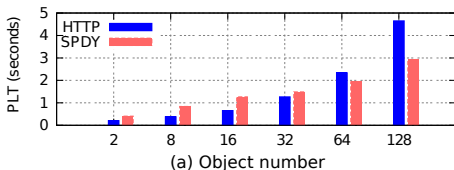


Figure: RTT = 200 ms, BW = 10 Mbps, PL = 0%.

Web page characteristics - Computation

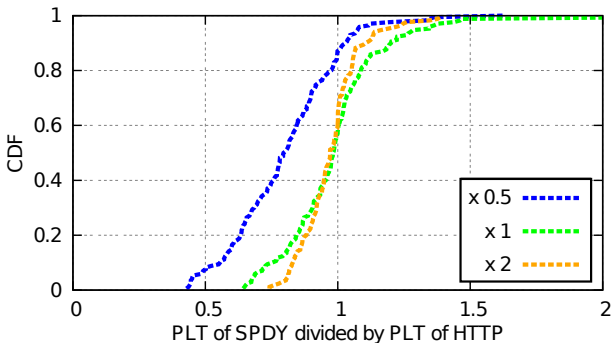


Figure: RTT = 200 ms, BW = 10 Mbps.

Sharding

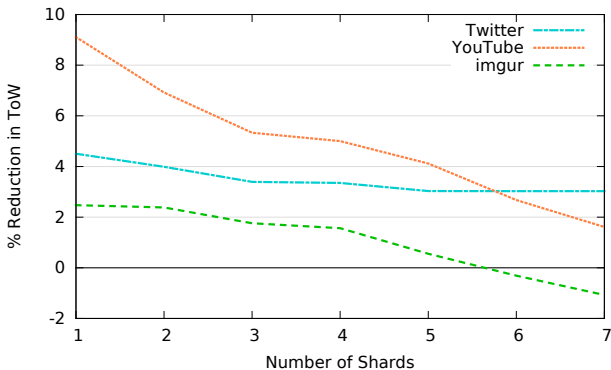


Figure: RTT = 150 ms, BW = 1 Mbps, PL = 0%.