An Experimental View on Fairness Between HTTP/1.1 and HTTP/2

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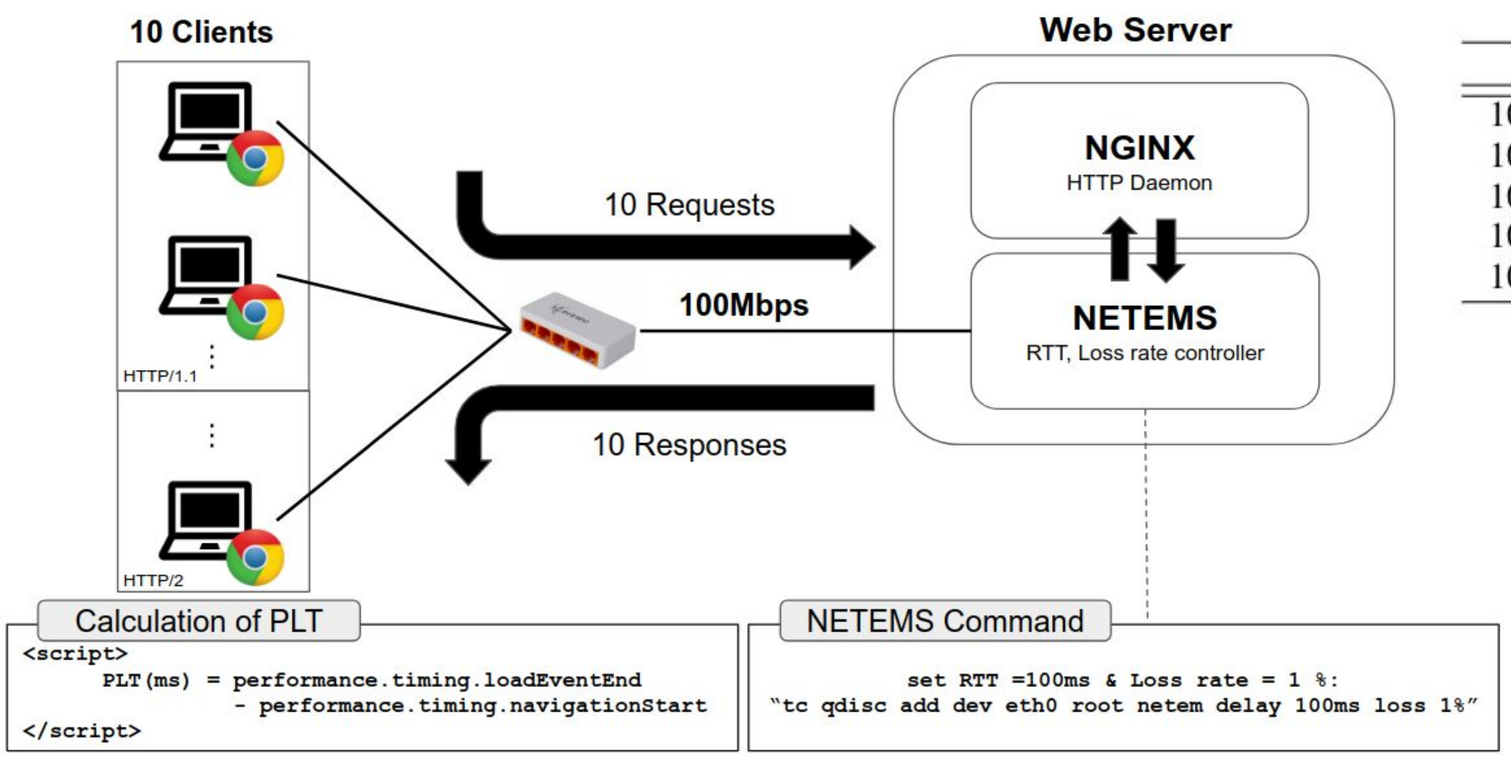
Motivation and Problem

- There is unfair resource allocation when HTTP/1.1 and HTTP/2 clients access to an web server at the same time because of the number of TCP connections

Experimental Setup



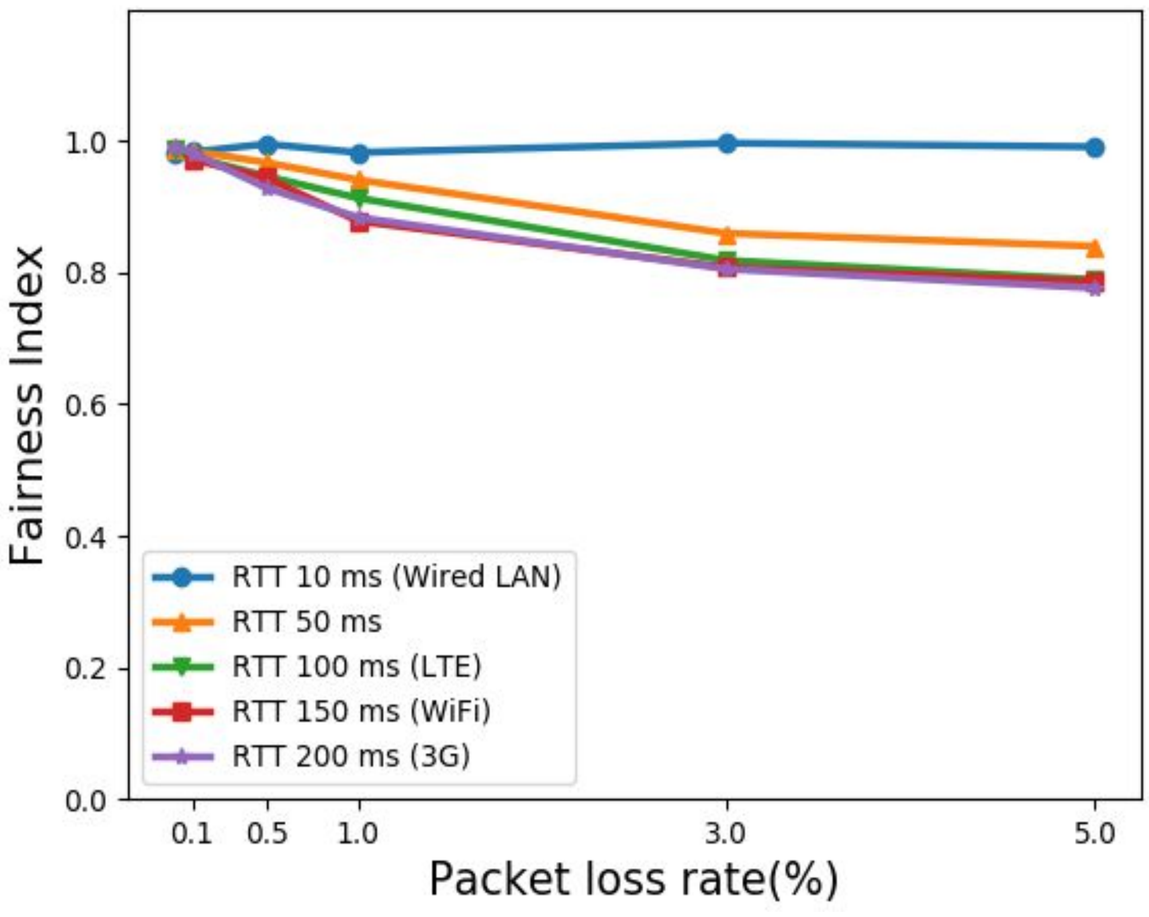
Experimental Environment

LAN		LTE		WiFi		3G	
10ms	0%	100ms	0%	150ms	0%	200ms	0%
10ms	0.5%	100ms	0.5%	150ms	0.5%	200ms	0.5%
10ms	1%	100ms	1%	150ms	1%	200ms	1%
10ms	3%	100ms	3%	150ms	3%	200ms	3%
10ms	5%	100ms	5%	150ms	5%	200ms	5%

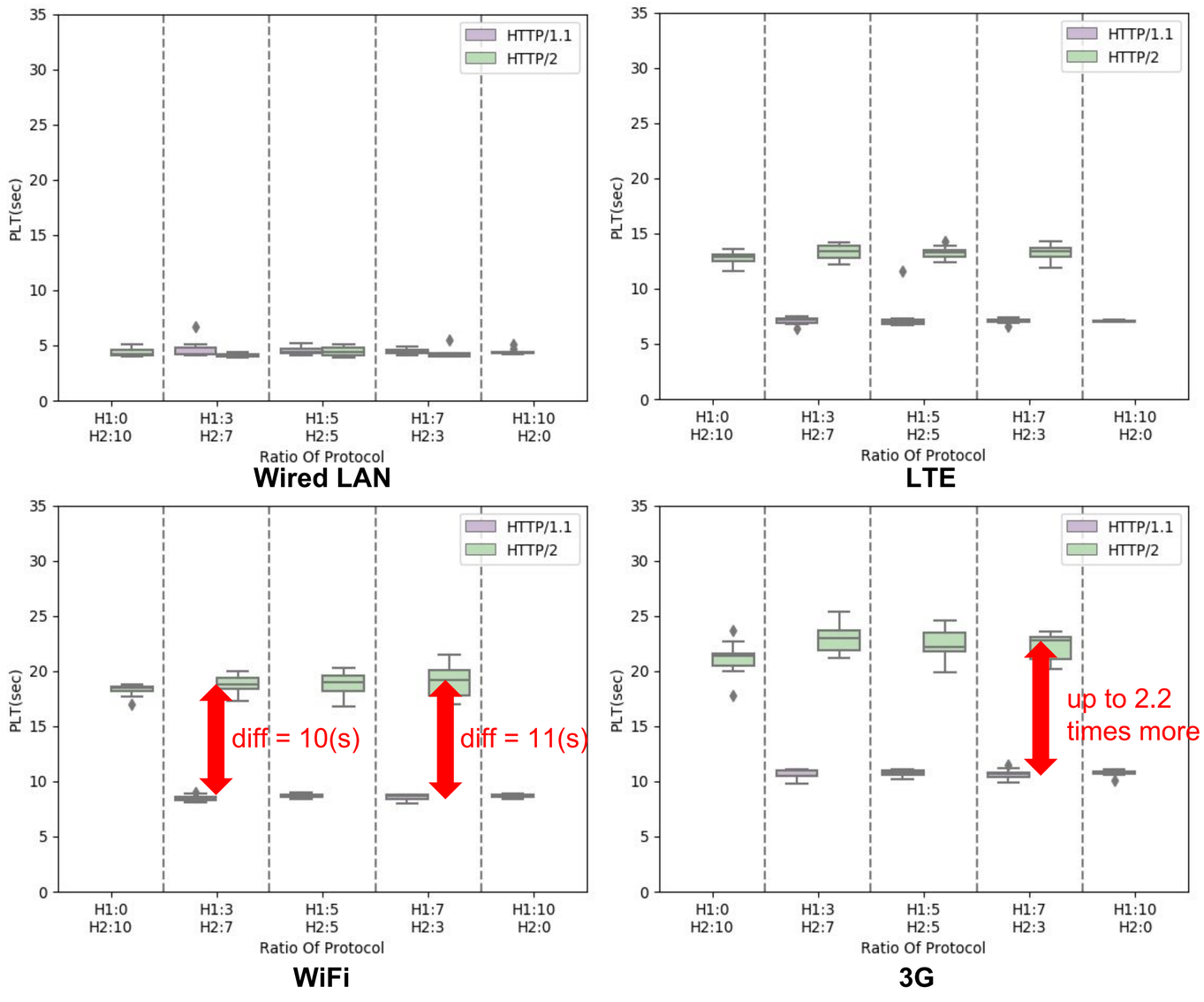
Test Network cases(RTT + loss rate)

- Test web page : Ebay
- repeat page loading 10 times
- The ratio of HTTP/1.1 and HTTP/2
  - 0:10, 3:7,5:5, 7:3, 10:0

Result



Fairness Index on test case network



PLT on test case network(loss rate = 1%)

- As loss rate and RTT is higher, the fairness index decrease
  - On 4G, fairness index = 0.97(loss rate 0.5%) → 0.76(loss rate 5%)
- As ratio of HTTP/1.1 and RTT is higher, the gap of PLT grows up
  - On 4G, maximum gap of PLT = 6.2(s)
  - On Wifi, maximum gap of PLT = 10.3(s)