

Performance analysis for TCP BBR in Mininet

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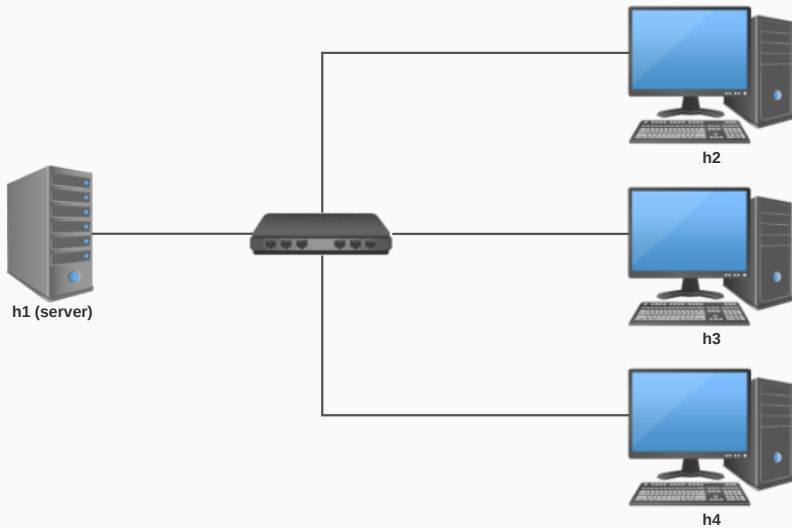
TCP BBR (from English Wikipedia)

- **B**ottleneck **B**andwidth and **R**ound-trip propagation time
- Developed by Google in 2016
- OpenSource
- For YouTube, BBR yielded an average of 4% higher network throughput (up to 14%)
- Available in Linux Kernel from version 4.9
- Seems not too fair to non-BBR streams (cit. Geoff Huston)

Test environment

- Mininet 2.3 on Debian 9
- Virtual machine running on VirtualBox
- Provisioned through Vagrant

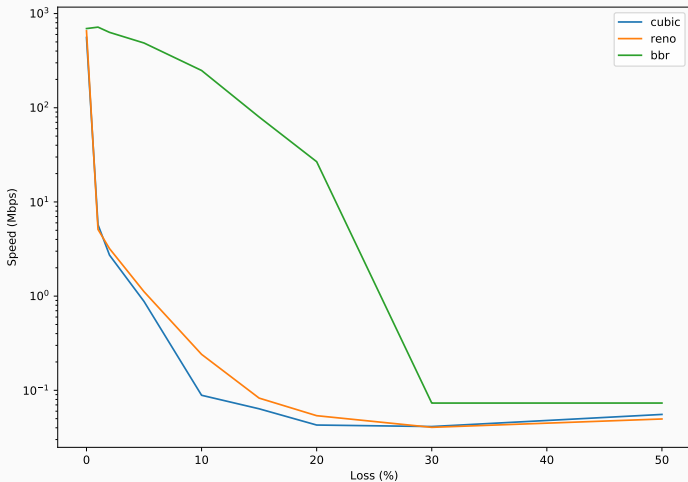
Topology



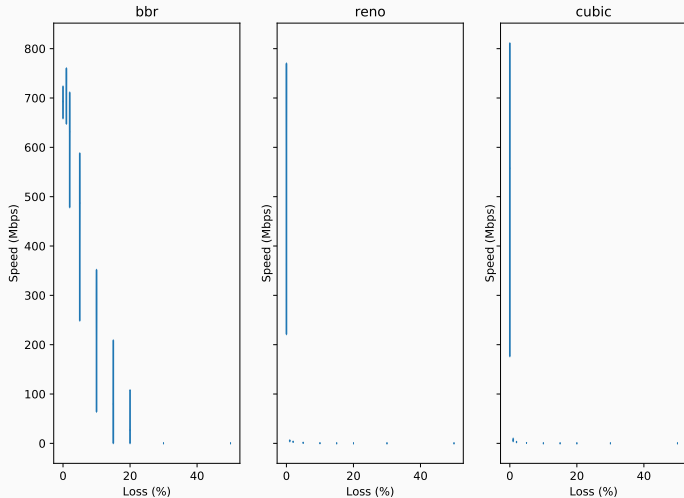
20 seconds Iperf test: description [1/3]

- h1 as server
- h2 as client
- Client options: `-f k -c IP -t 20`
 - f k kbps as output format
 - t 20 Run for 20 seconds

20 seconds Iperf test: speed (log) [2/3]



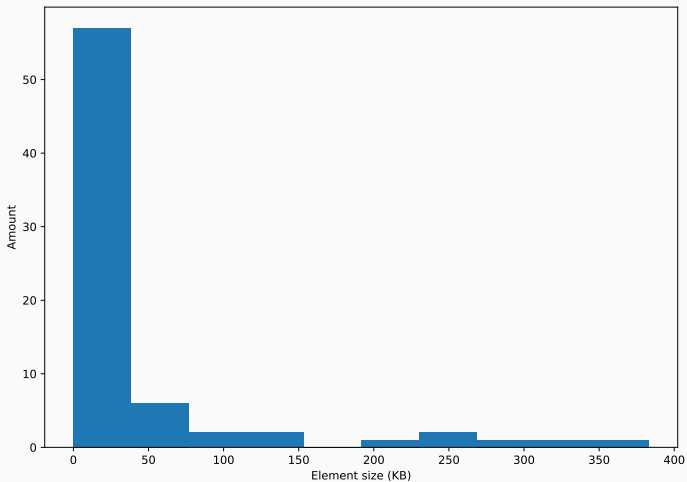
20 seconds Iperf test: speed distribution [3/3]



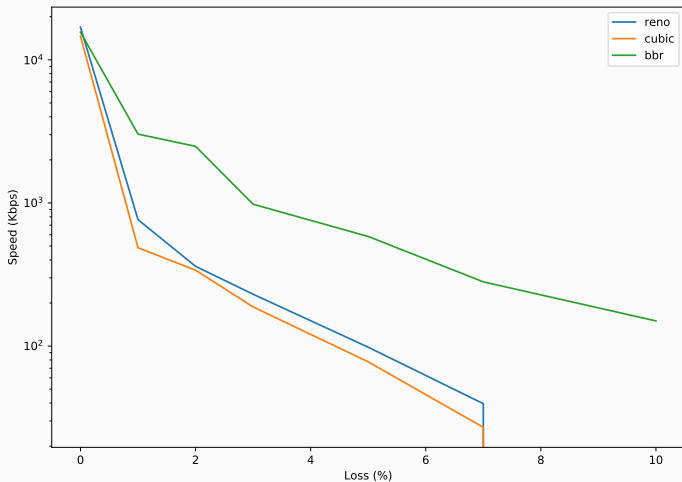
Complex web page simulation: description [1/4]

- h1 as server
- h2 as client
- nginx as server since Python's SimpleHTTPServer is too slow
- wget -r as client, simulating the web page browsing
- bbc.co.uk index page as an example: elements has same size but random data
- 72 elements with a total size of 2.902 MB
- Speed is obviously slower than a single big file download
- Elements included as images into a simple HTML file

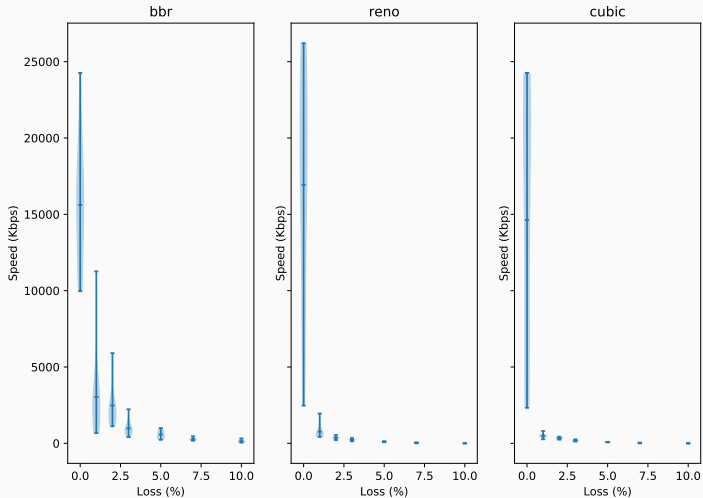
Complex web page simulation: page structure [2/4]



Complex web page simulation: speed (log) [4/4]



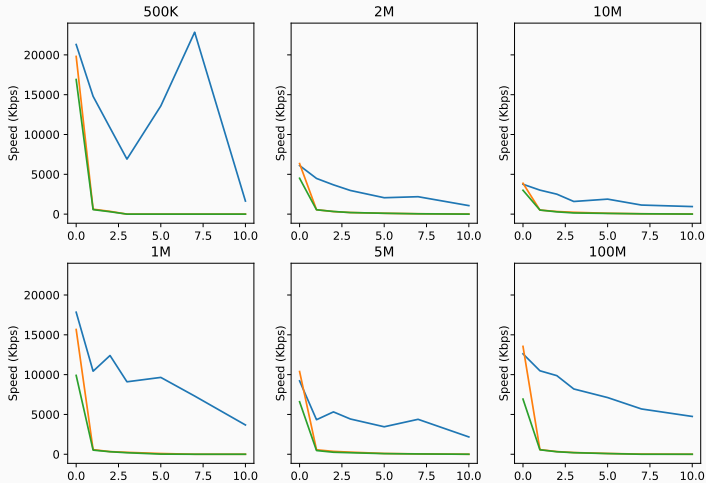
Complex web page simulation: speed distribution [4/4]



Single file download: description

- h1 as server
- h2 as client
- As before, nginx as server
- Simple wget as client, 120 seconds timeout
- 500KB, 1MB, 2MB, 5MB, 10MB and 100MB files
- Random content in files

Single file download: speed for every size and protocol [1/2]



Single file download: BBR performances [2/2]

