

Understanding protocol overhead at different levels of TCP/IP stack

Run "wget http://mirror.pramati.com/ubuntu-releases/18.04.1/ubuntu-18.04.1-desktop-amd64.iso -O /dev/null" for 20s duration. Answer the following questions

1. What is /dev/null?
2. What throughput range do you see when you run this experiment on your laptop?
3. What throughput do you see, when you use a wired connection?
3. Can you explain the difference in throughput between the first and second experiment?
4. Use Wondershaper (<https://github.com/magnific0/wondershaper>) to limit your network speed to 1 Mbps. What throughput do you see now?
5. Run Wireshark and compute the protocol overhead.
 - a) In Wireshark session, look at packets downloaded to your machine corresponding to the ubuntu iso file. What is the size of each packet?
 - b) Compute the size of each header (Link layer, IP, and TCP). What is the protocol overhead i.e. the ratio of header bits to the actual data transmitted

Measure latency using ping

Latency has 3 components, propagation delay, transmit delay and queueing delay.

1) Write down the latencies for each case

ping 127.0.0.1

ping nitw.ac.in

ping www.google.com

ping www.iitmandi.ac.in

2) What is the relative ordering among the latencies? Why? Which component of latency majorly affects the observed results?