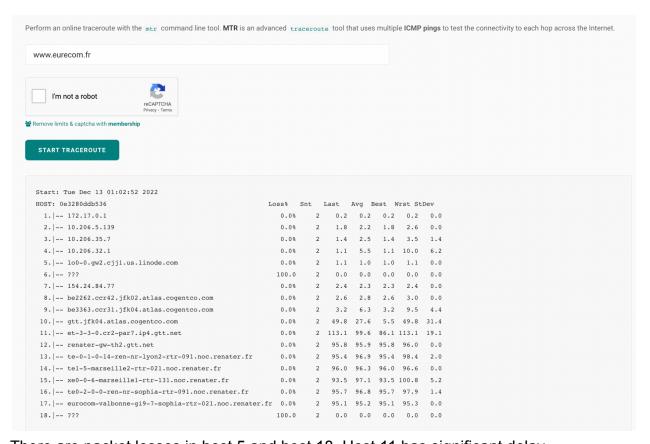
- 1. After circuit switching is established, let's assume the initial circuit is the optimal path. However, over time, there may be a better path for servers in circuit switching. The previous circuit is not the optimal anymore
- 2. DSL uses telephone lines and is the slowest option, whereas cable transmits data over copper TV lines, works faster, and carries more bandwidth. DSL is widely available because almost every part of the country has access to phone service, so it's a great option for people in rural areas who don't want to choose satellite internet. Cable is ideal if you stream on multiple devices. One way to improve DSL is to reduce the distance between the user house and local office.
- 3. The non-persistent connection takes a total time of 2RTT + file transmission time. It takes the first RTT (round-trip time) to establish the connection between the server and the client. The second RTT is taken to request and return the object. This case stands for a single object transmission. Non Persistent connections are the default mode for HTTP/1.0 and persistent connections are the default mode for HTTP/1.1. Non-persistent HTTP is used in fetching those objects which are not needed that frequently. It does not lead to a wastage of resources since the connection is opened only when some data needs to be sent over it. It is more secure than persistent HTTP since after sending data over the connection, the connection gets terminated and nothing can be transmitted over it once it gets terminated.
- 4. DDoS attacks: distributed denial of service, The attacker controls an overwhelming amount of computers (hundreds or thousands) in order to spread malware and flood the victim's computer with unnecessary and overloading traffic. Not successful to date, because Traffic Filtering (configured to block ping messages) and Local DNS servers cache IPs of TLD servers, allowing root server bypass.
- 5. Traceroute to www.eurecom.fr



There are packet losses in host 5 and host 18. Host 11 has significant delay

6. tit-for-tat means that in order to receive files, you have to give them. With
BitTorrent, the more files you share with others, the faster your downloads are.
Finally, to make better use of available Internet bandwidth (the pipeline for data
transmission), BitTorrent downloads different pieces of the file you want
simultaneously from multiple computers. If you continue to run the BitTorrent
client software after your download is complete, others can receive .torrent files
from your computer; your future download rates improve because you are ranked
higher in the "tit-for-tat" system.

Client Server

		N		
		10	100	1000
и	300 Kbps	5000s	50000s	50000s
	700 Kbps	5000s	50000s	50000s
	2 Mbps	5000s	50000s	50000s

Peer to Peer

		N N		
		10	100	1000
и	300 Kbps	4545s	25000s	45454s
	700 Kbps	4054s	15000s	40540s
	2 Mbps	3000s	6521s	7389s

- 8. a) propagation delay = $12000000/2.5*10^8 = 0.048s$
 - b) transmission delay = $8*6*10^6/5*10^6 = 9.6$ s
- 9. c) $4000000/4*10^6 + 4000000/5*10^6 + 4000000/6*10^6 = 2.46s$
 - d) 2*2*6/5 = 4.8s
 - e) transmission delay + propagation delay = 2*20/5 + 2.46s = 10.46s