Lab Setup (Packet Tracer):

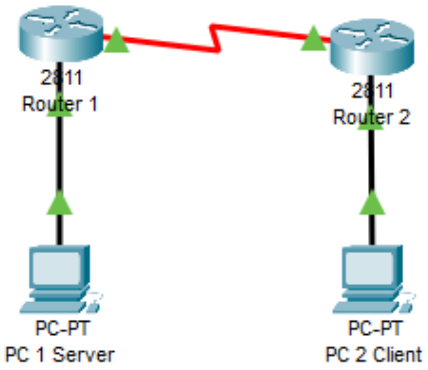

Figure 1. Lab Setup of two pc's and two routers

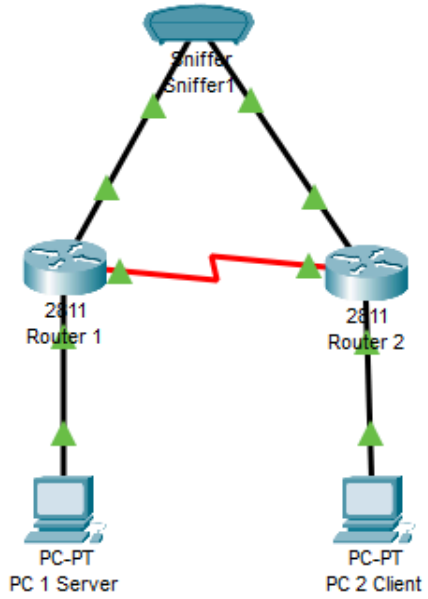

Figure 2. Lab Setup for the Sniffer tool

This is the setup required to undertake network performance testing with various simulations such as the Sniffer tool.

Lab Instructions:

1. **Latency and Packet Loss Testing (Ping & Traceroute in Packet Tracer)**

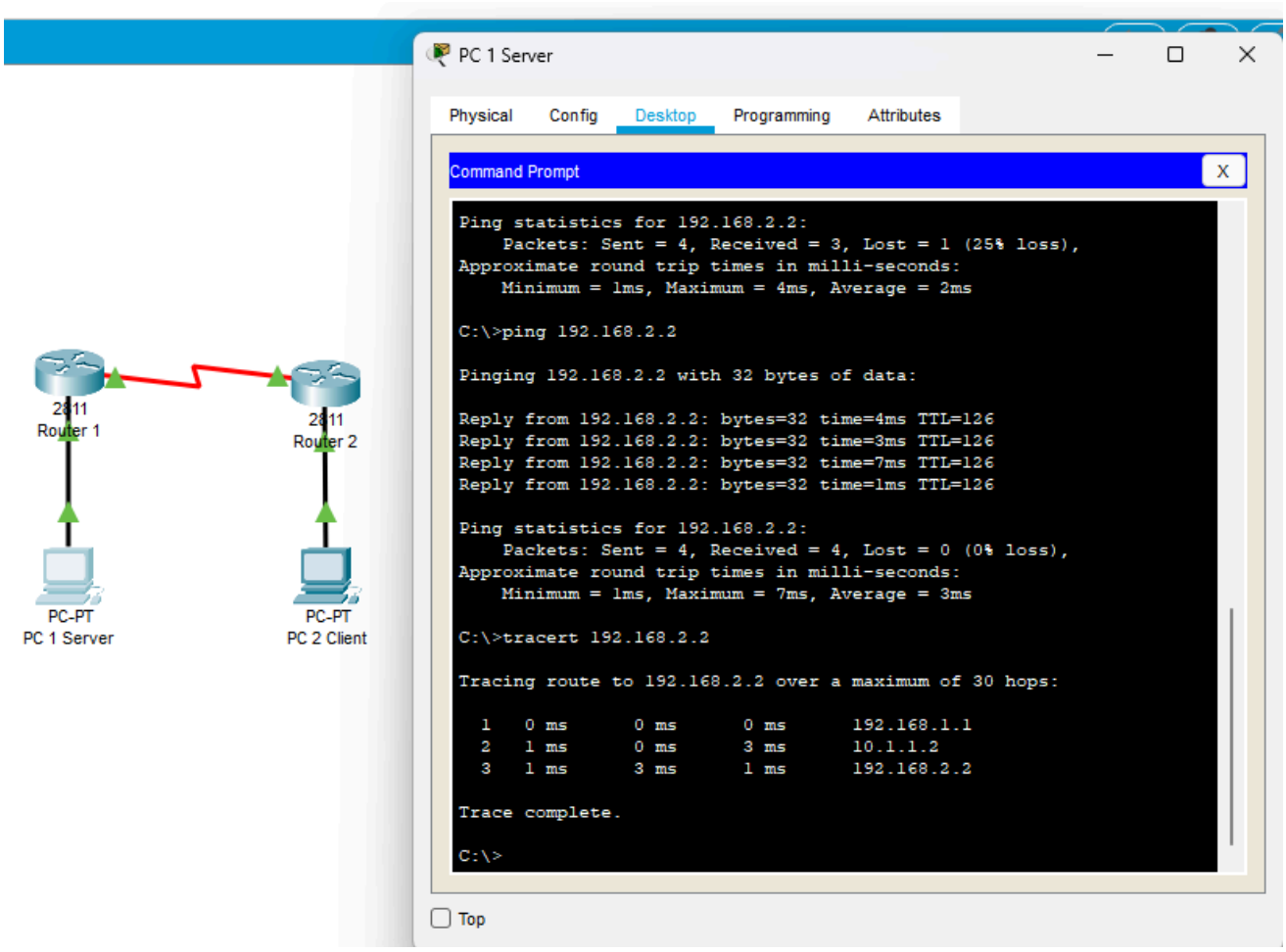

Figure 1. Ping PC 2 to PC 1 and Trace route

This is for latency and packet loss testing, in which I ping the PC 2 (Client) to the PC 1 (Server) with a certain IP address while simultaneously pinging the trace route. This is to test that the IP addresses are correctly configured and that PCs 1 and 2 communicate with both routers.

2. Bandwidth Testing (Traffic Simulation in Packet Tracer)

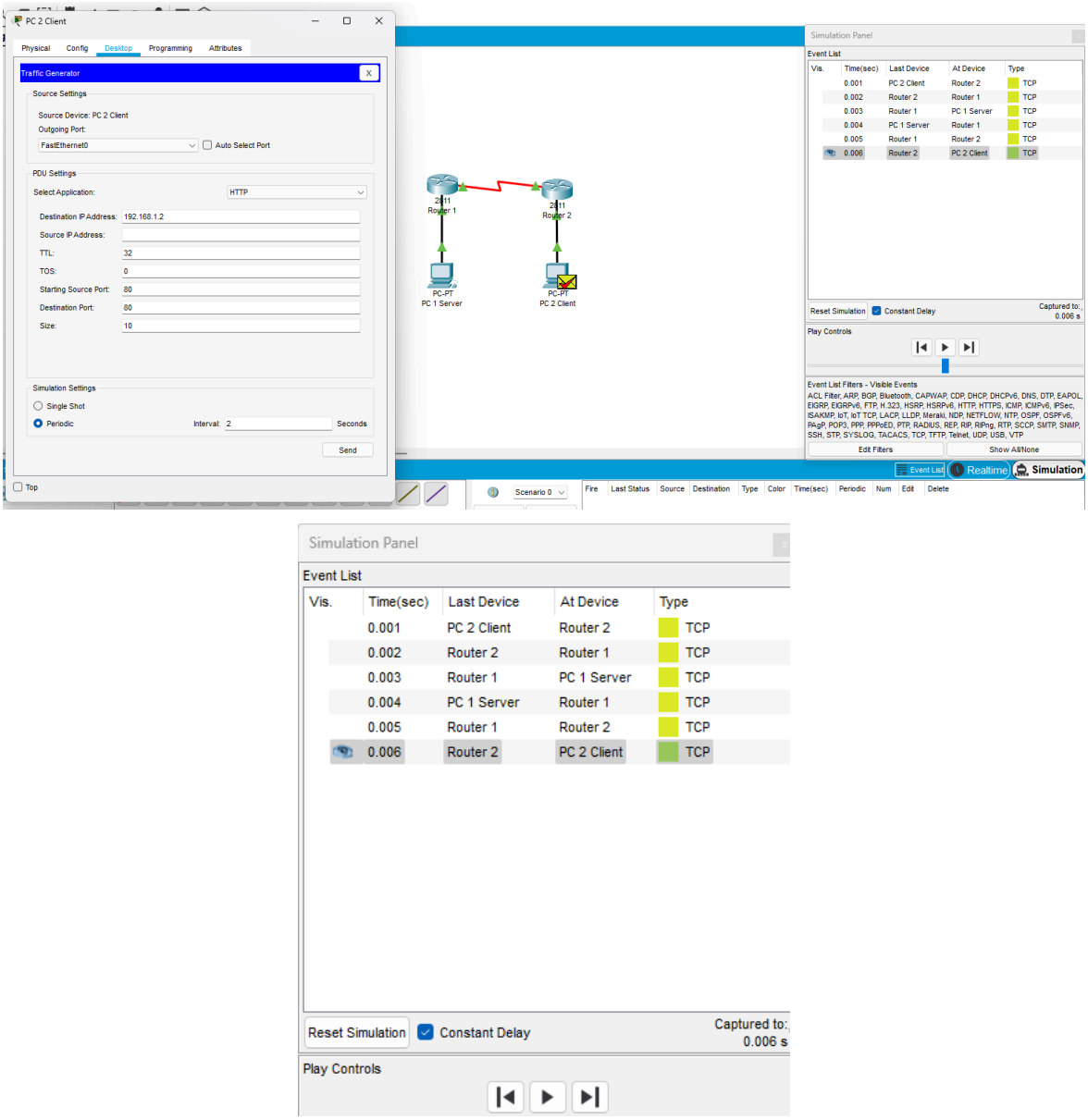

Figure 1. Bandwidth Testing using the Traffic Generator and Simulation tool

This is where traffic is created to the client and then to the server to ensure that both messages were received appropriately. We used HTTP to create traffic and specified a 10MB size, with the HTTP starting source port at 80.

3. Jitter Testing (Traffic Simulation and Analysis)

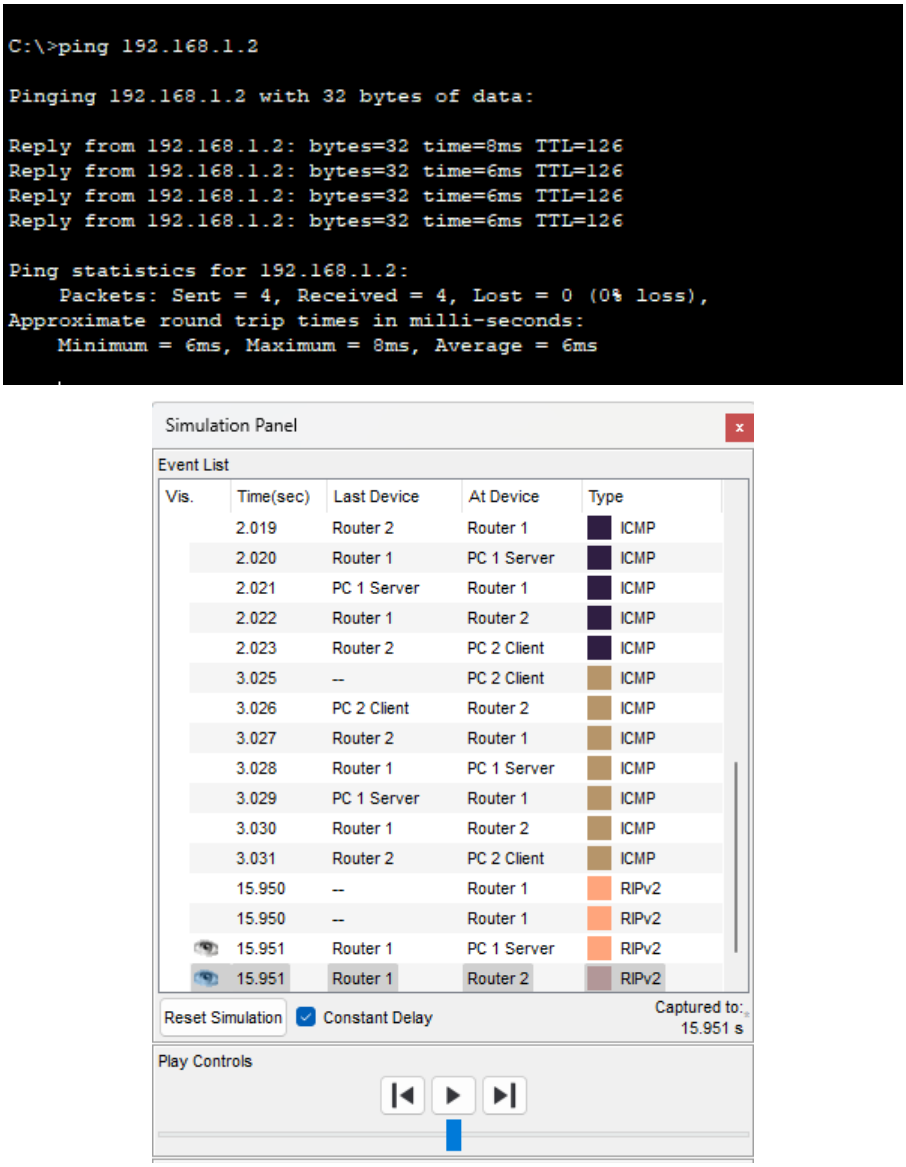

Figure 1. Jitter Testing using the ping of the client and using the Simulation tool

This is where the differences in time occur, or where the delays occur between the server and the client. When you ping it to the client, it takes time to receive responses from the cmd because the traffic is captured in simulation mode and has a different time of capture.

4. Packet Analysis (Simulation Mode)

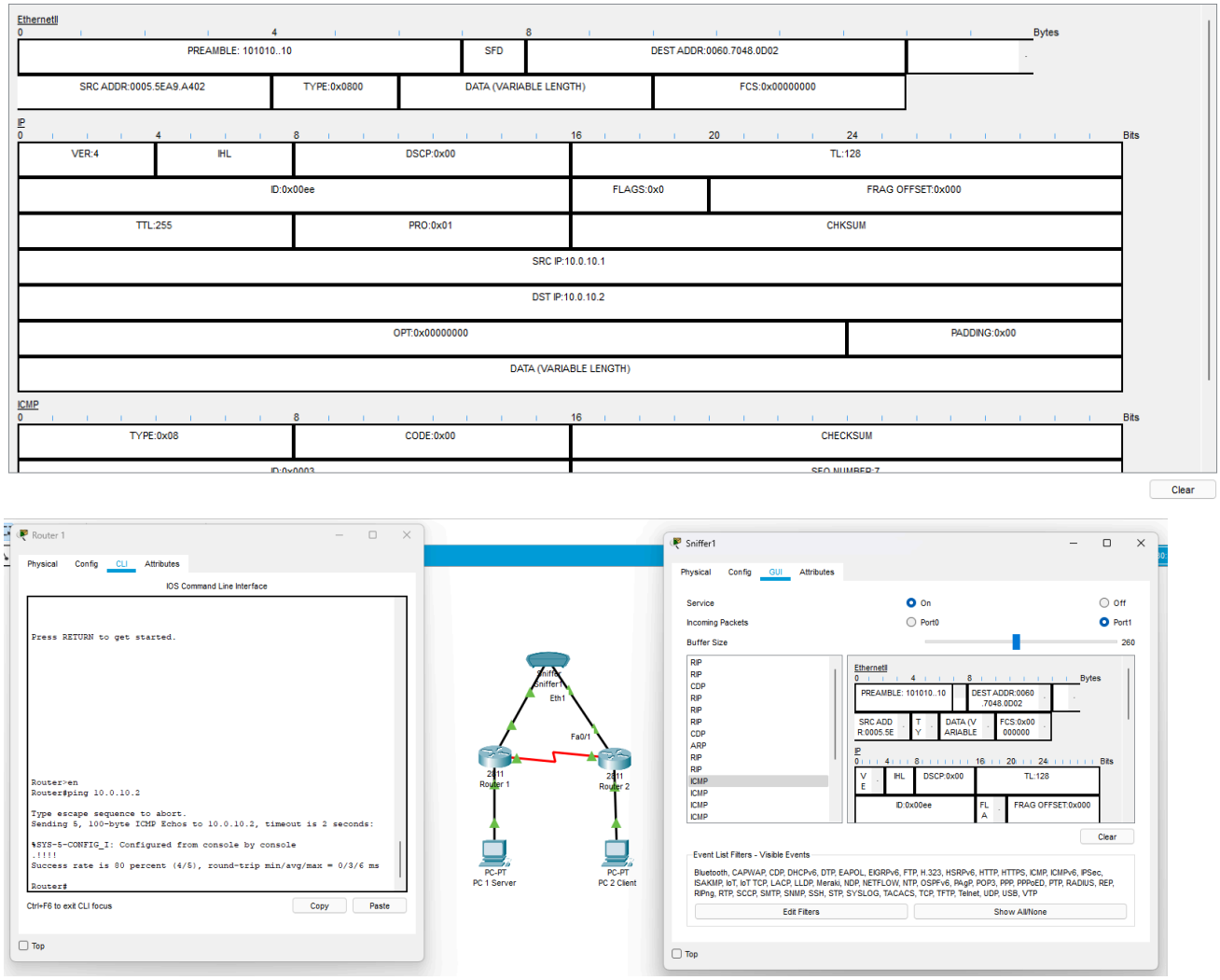

Figure 1. Packet Analysis using the Sniffer tool and the Simulation tool

This is where the sniffer simulation takes place, with the ICMP (Internet Control Message Protocol) being sent between router 1 and router 2 via the sniffing port. We ping Router 2 to Router 1 to configure the Sniffer and monitor the ICMP traffic in real time and simulation mode.