

## ABSTRACT

The fast development of internet and multimedia application require special Quality of Services requirements. But, TCP/IP network is not designed to transmit multimedia application which is realtime. MPLS technology comes to improve the QoS without significantly change the infrastructures and sacrificing the scalability of its network. MPLS technology will shortened the time when packets are in the system. It is because every packet is labelled which is used as information to switch the packet to the other routers. PT. Telkom, as one of biggest VoIP service providers, is using MPLS router as their backbone to support the whole network.

In this final project, the existing network of PT. Telkom is simulated using Network Simulation-2 with various load traffic which is could affect the performance of the network. This simulation uses VoIP as the monitoring media with G.729 codec. This simulation also compares the performance of the network using MPLS and without using MPLS. The parameters which are obtained are delay, jitter, packet loss, and throughput.

The results of the simulation show the descent of network performance when the load traffic are raising. But, when the network is using MPLS, the descent is as not as significant as the network without MPLS. In other words, MPLS network gives performance improvement, especially on delay and throughput. There are some optimalization based on the simulation results to maintain better performance of the network.