

## ABSTRACT

Multiprotocol Label Switching (MPLS) is an Internet Engineering Task Force (IETF) standard data forwarding method which works on multilayer protocol. MPLS integrates data link layer switching and network layer routing. Network layer's IP provides QoS mechanisms, Integrated Service (IntServ) and Differentiated Service (DiffServ), while MPLS provides traffic engineering capability and routing technique, thus optimize network resources. By implementing MPLS+QoS, service providers would be able to guarantee delay, bandwidth, and would be able to control network load. Furthermore, service providers would be able to provide several class of services with QoS guarantee.

This final project explains MPLS, IntServ, DiffServ, MPLS+DiffServ concepts. We will discuss tagging using IP Precedence as QoS management method. The research will focus on the capability of DiffServ implementation on PT. Aplikanusa Lintasarta's MPLS Network carrying real-time traffic, especially VoIP, by analyzing ITU-T standard QoS parameters.

This research shows that the implementation of QoS on PT. Aplikanusa Lintasarta MPLS network provides good characteristics on delay, packet loss, and availability, of which measurement results are: average one way delay on June 2005 = 12.5180 – 90.1278 ms, average packet loss = 0,00% - 0,36%, and average availability = 99,42% - 99,99%. It is also more than qualified for carrying real-time traffic, especially VoIP traffic, considering MOS values which were obtained from the conversion of E-Model's R factor values (MOS = 4,0 - 4,1).

*Keywords: MPLS, Quality of Service, DiffServ, E-Model*