ABSTRACT

Quality of Service (QoS) is an important thing to consider in a communication system. To ensure that service level, service providers must not only provide large data channel but also looking for best architecture that can provide guaranteed QoS and optimalizes the performance with minimal increase in cost of network resources, one of which is the MPLS technology. Multi Protocol Label Switching (MPLS) is a method of forwarding data across a network using the information in the label attached to the IP packet. With this type of *routing* is applied to the MPLS network, expected to be able to deliver increased value of QoS on the network. One feature is the ability to establish MPLS tunnels or virtual circuits across the network. This capability makes MPLS serves as a natural *platform* for building VPNs. With the addition method of Differentiated Services (Diffserv) on this technology, the entire stream of packets of information divided into several classes based on the tagging done by the user, either in an end system or router, or the provider of services for each different priority.

In this final project, has been carried out performance analysis of MPLS-VPN integrated with Diffserv Tunneling Modes and compared with MPLS VPN non-Diffserv in small network and use GNS3 as MPLS Router. Three distinct modes will be used are Uniform mode, Short-pipe mode and Pipe Mode.

From the emulation, the result is MPLS-VPN Tunneling Mode, especially Diffserf Uniform Mode can make QoS better. Seen from result throughput increased 16,84%, delay reduced 19,43%, packet loss reduced 6,34%, and jitter reduced 10,5% which got from network using technology MPLS-VPN Tunneling Modes is better than network without integrated Diffserv Tunneling Modes.

Keywords: MPLS, MPLS-VPN, Diffserv Tunneling Modes, VoIP, QoS