ABSTRACT

Along with the improvement of technology based on packet based, performance and utility network became one of the main problem in Quality of Service (QoS). QoS is not directly obtained, but it which the packet will sent to the network each period without negotiate about condition of the network and quality of the packet that arrived in destination.

Differentiated service is one of QoS model which better than best effort model, and can be embed in IP network. Besides the problem of model QoS, forwarding method of the packet also became the concern problem. Forwarding method such as Multi Protocol Label Switching is very needed. MPLS is a method of forwarding data over a network by using the information in the label attached on the IP packet. Along with its development, MPLS offers traffic engineering function by finding path that have low utility link so that can minimalize the queue in the router. MPLS-TE have *fast reroute* feature that enable if there is a failed link it will faster to reroute to another path, so the packet is not have to wait and make the value of the QoS worse.

In this reasearch was implemented *fast reroute* (FRR) feature in MPLS-TE and apply methods of differentiated service on the network by using GNS3 IOS router as MPLS Routers for VoIP and *video conference* service. The test results of adding the diffserv method on MPLS-TE network showed decrease 56.4% in *delay* for VoIP services, 6.03% for *video conference* service. For *jitter* parameters with *fast reroute* showed a decrease 57.03% for VoIP services, 3.7% for streaming video services. For throughput parameter showed a increase of 0,083% for VoIP services, and 26.93% for the *video conference* service.

Keyword : *Quality of Services(QoS)*, Differentiated Service, MPLS-TE Fast reroute, IMS