

ABSTRACT

In the beginning, when data still exchanged with an email, the needs of bandwidth still filled. But internet keep on growing day by day, the demands of voice, video and data has become out of control. Hence, it caused bottleneck in existing network. Of course, that thing would become our new challenge to develop existing network to solve that problem.

Almost all company needs access to network broadband that provide external and internal communication service. To handle that problem, Metro Ethernet Network has designed to give solution for the HEM (High End Market). In this case, standard which is used is Metro Ethernet Forum, IEEE 802.1, IEEE 802.3, IEEE 802.1p and IEEE 802.1Q. The Metro Ethernet can transferred data over 10 Gbps. It is important for company to access the network with high speed transmit.

This final project study service and architecture Metro Ethernet Network for HEM application in optical network, based on performance point of view, consist of throughput, delay, jitter, packet loss, bandwidth utilization, collision percentage, and error percentage. Based on calculation result, could got some conclusions: EWS average throughput is 0.682 and ERS is 0.2. Jitter for EWS is 0.235 μ sec and ERS is 57.04 μ sec. EWS average delay is 1.961 μ sec and ERS average delay is 6.744 μ sec. Additional QoS can improve throughput until more than 0.5. Before RPR, average of bandwidth utilization is 5.349%, average throughput is 0.328, and average delay is 1.9 μ sec. And after RPR, average of bandwidth utilization is 12.98%, average throughput is 0.51, and average delay is 2.19 μ sec. Before jumbo frame, average delay is 4.353 μ sec, average error percentage is 0%, and average of bandwidth utilization is 12.184%. And after jumbo frame, average delay is 97.336 μ sec, average error percentage is 6.648%, and average of bandwidth utilization is 34.908%.