ABSTRAK

Frame relay merupakan protokol *Wide Area Network* (WAN) yang menggunakan teknologi akses berkecepatan tinggi. Implementasi jaringan *frame relay* dapat mempermudah komunikasi data antar kantor-kantor perusahaan yang letaknya terpisah dengan jarak yang sangat jauh. PT Serayu Group memiliki empat kantor yang terletak di Jakarta, Banjarnegara, Lumajang, dan Cirebon. Saat ini, PT Serayu Group memanfaatkan jaringan *internet* untuk komunikasi dan transfer data antar kantor. Namun, koneksi jaringan *internet* perusahaan sering mengalami masalah kestabilan koneksi atau *down*. Oleh karena itu, penulis mencoba merancang jaringan komputer berbasis *frame relay* pada PT Serayu Group agar komunikasi, *file transfer*, dan koordinasi dalam menyusun rencana kerja lebih efisien dan lancar. Pengukuran parameter *delay*, *throughput*, *packet loss*, dan *utilization* digunakan untuk mengetahui unjuk kerja rancangan jaringan *frame relay* maupun jaringan *internet*.

Dalam tugas akhir, perancangan dan analisa jaringan *frame relay* menggunakan *software* simulasi *Graphical Network Simulator* 3 (GNS3). Rancangan jaringan disesuaikan dengan kondisi PT Serayu Group. Evaluasi unjuk kerja jaringan *frame relay* dilakukan dengan menggunakan skenario *download file* 11MB, email 1 MB, dan *video streaming* saat *client* bersama-sama melakukan aktivitas masing-masing skenario.

Pada umumnya, unjuk kerja rancangan jaringan *frame relay* masih memiliki kualitas yang lebih baik dibandingkan jaringan *internet* perusahaan dilihat dari perbedaan antara *delay, throughput, packet loss*, dan *utilization*. Hal ini dapat terjadi karena seluruh *host* pada jaringan *frame relay* terhubung dalam *intranet* atau jaringan lokal. Berdasarkan pengujian dan analisa, jaringan *frame relay* memiliki kemampuan mentransmisikan data yang lebih baik dibanding jaringan *internet* perusahaan.

Kata kunci : *frame relay*, *internet*, parameter unjuk kerja jaringan, GNS3

ABSTRACT

Frame relay is *Wide Area Network* (WAN) protocol which implemented high speed access technology. The implementation of *frame relay* networks made it easier to communicate data across companies which located in separated area. PT Serayu Group had four branch offices spread in Jakarta, Banjarnegara, Lumajang and Cirebon. Recently, PT Serayu Group made use of *internet* connection to communicate and transfer data between offices. However, *internet* network connection within the company often got trouble in term of connection stability or *down*. Therefore, the writer tried to design *frame relay*-based connection for the computers in PT Serayu Group so that the communication, *file transfer*, and coordination of work planning could be done efficiently and promptly. Parameter measurement of *delay, throughput, packet loss*, and *utilization* was applied to recognize *frame relay* networks designed performance and also the *internet* networking as well.

In this final assignment, designing and analyzing of *frame relay* networks were applying *software* simulation of *Graphical Network Simulator* 3 (GNS3). Network design was adjusted with PT Serayu Group condition. Evaluation of *frame relay* networks performance conducted by scenario of *download file* 11 MB, email 1 MB and *video streaming* simultaneously by clients on each scenario activity.

In general, *frame relay* networks designed performance still indicated better quality compared to company internet networking as it determined from *delay, throughput, packet loss*, and *utilization*. This could be happened since all *hosts* within *frame relay* networks were connected in *intranet* or local connection. Based on the result of testing and analyzing, *frame relay* networks showed the capability in transmitting data which was better than internet networking within the company.

Keywords: *frame relay*, *internet*, network performance parameter, GNS3