ABSTRACT

A computer network is a system that consists of several computers connected to each other. The functions of a computer network include sharing resources and facilitating communication between computers. The computer network in Secretariat regional office of Salatiga is not optimal since there is no router to manage bandwidth management. Besides, there is only 20% of the computers connected to wired LAN network and the other are connected via wireless LAN so that the need for computer network access cannot be maximally fulfilled.

This research aims to produce optimal design and configuration of computer network. Data collection methods used the method of observation, interviews and literature. Meanwhile, computer networks design used the top-down method with a backbone of optical fiber. Furthermore, the router used the Cloud Router Switch CRS326-24G-2S + RM, and the Cloud Core Router CCR1036-12G-4S (v2).

Through the design and configuration of computer networks in Secretariat regional office of Salatiga, it is expected to facilitate the work related to e-government. The design and configuration of computer networks has been tested by speed test, bandwidth test and filezilla FTP client. Based on testing using a speed test before repairing a computer network, the upload rate was 4.67 Mbps and download rate was 9.04 Mbps. Whereas after the improvement, the upload rate showed 47.87 Mbps, download was 60.42 Mbps ping 6 ms, jitter 0.50 ms and 0% packet loss. After implementing bandwidth management using PCQ Queue, the upload rate was 9.67 Mbps, download rate was 9.78 Mbps 6 ms ping, 1.34 ms jitter and 0% packet loss when traffic is high. While before testing improvements using filezilla, it showed upload 3.8 Mbps and downloads of 2.9 Mbps. The measurements after repairs were obtained uploads of 92 Mbps and downloads of 249 Mbps. Testing after the application of PCQ Queue obtained uploads 20.13 Mbps and 93.95 Mbps for downloads when the traffic is heavy.

Keywords: Design and configuration, Computer network, PCQ Queue, top-down.

PUSAT PELAYANAN DAN
PENGEMBANGAN BAHASA

ABSTRAK

Jaringan komputer adalah suatu sistem yang terdiri atas beberapa komputer yang saling terkoneksi dengan perangkat lainnya. Fungsi jaringan komputer antara lain berbagi sumber daya dan memudahkan komunikasi antar komputer. Jaringan komputer di gedung Sekretariat Daerah Kota Salatiga belum optimal karena belum terdapat *router* untuk mengatur manajemen *bandwidth* dan hanya 20% komputer yang tersambung di jaringan *LAN* kabel sisanya tersambung melalui *wireless LAN* sehingga kebutuhan akan akses jaringan komputer belum bisa dipenuhi secara maksimal.

Penelitian ini bertujuan untuk menghasilkan desain dan konfigurasi jaringan komputer yang optimal. Metode pengumpulan data menggunakan metode observasi, wawancara dan literatur. Sedangkan untuk mendesain jaringan komputer menggunakan metode *top-down* dengan *backbone* menggunakan *fiber optic*. Untuk router menggunakan *Cloud Router Switch CRS326-24G-2S+RM*, dan *Cloud Core Router CCR1036-12G-4S(v2)*.

Melalui desain dan konfigurasi jaringan komputer di Sekretariat Daerah Kota Salatiga diharapkan dapat memperlancar pekerjaan yang berkaitan dengan e-goverment. Desain dan konfigurasi jaringan komputer telah diuji menggunakan *Speedtest, Bandwidth Test* dan *Filezilla FTP Client*. Berdasarkan pengujian menggunakan *speed test* sebelum perbaikan jaringan komputer diketahui besar *upload* sebesar 4,67 Mbps *download* sebesar 9,04 Mbps, setelah dilakukan perbaikan didapat besar *upload* 47,87 Mbps, *download* 60,42 Mbps *ping* 6 ms, *jitter* 0,50 ms dan *packet loss* 0%. Setelah dilakukan penerapan manajemen *bandwidth* menggunakan *PCQ Queue* maka diperoleh *upload* sebesar 9,67 Mbps, *download* 9,78 Mbps *ping* 6 ms, *jitter* 1,34 ms dan *packet loss* 0% saat *traffic* tinggi. Sedangkan sebelum perbaikan pengujian menggunakan *Filezilla* menunjukkan angka *upload* sebesar 3,8 Mbps dan *download* sebesar 2,9 Mbps, pengukuran setelah dilakukan perbaikan diperoleh *upload* sebesar 92 Mbps dan *download* sebesar 249 Mbps. Pengujian setelah penerapan *PCQ Queue* diperoleh *upload* 20,13 Mbps dan 93,95 Mbps untuk *download* saat *traffic* padat.

Kata kunci : Desain dan konfigurasi, Jaringan komputer, *PCQ Queue,* top-down.