ABSTRACT

Presentation system based on ICT that has been applied in Telkom University is iGracias. This system is connected to Radio Frequency Identity (RFID) Over Fiber device which installed in all classrooms at 48 buildings of Telkom University. The RFID device used works on data traffic and security services based on Slotted ALOHA protocol, where this protocol has no anti collision, so it will allowing data to collide or disappear while transmitted. The possibility of missing data (drop) is greater when traffic density occurs. From all buildings in Telkom University, Tokong Nanas Building (KU3) is the most densely populated building during lecture hours from Monday to Saturday, 06:30 am to 18:30 pm. This because the building is shared by 7 faculties at Telkom University.

The current problem, tapping failure is very common when traffic on KU3 Building is in dense condition. To overcome the problem, this final project proposed a new queuing model design by Kendall Notation to manage traffic density. The design is based on System Performance Improvement Test which refers to the result of evaluation from traffic density against parameters: percentage of traffic density, utilization (ρ), traffic volume (V) and traffic intensity (A). The evaluation is divided into 2 sub-sections, i.e. a day and a week. This final project will used back up of student present data from 2nd Semester FY 2016/2017.

Based on analysis, the queuing model in the existing condition is (M/M/1):(FCFS/500/256). After evaluation, it is known that KU3.06 and KU3.07 are the highest traffic density with utilization (ρ) up to 95.50%, traffic volume (V) up to 25.648 minutes, traffic intensity (A) up to 53.141 minutes and Failure Rate up to 39.21% -51.06%. Then, with System Performance Improvement Test scheme in form of addition 1 unit buffer server for KU3.06 and KU3.07 which expressed with notation (M/G/2):(FCFS/500/256), got the mean: decrease ρ equal to 68 , 1%, V decrease to 19.912 minutes, A decrease to 41.24 minutes, and server capacity increase to 1559 tapping Presence. But Failure Rate can not be determined because it has not been implemented yet.

Keywords: *RFID, Queueing System, Traffic Engineering, Utilization, Kendal Notation.*