

## ABSTRACT

Information technology has become a matter that should be owned by the company at this time. By applying IT in the enterprise, the enterprise information system will work optimally so that the performance of the company will increase. Reef building of the Faculty of Industrial Engineering University of Telkom is one part of the Faculty of the University of Telkom engaged in serving the educational program as well as the administration Telkom University. The reef building using cable transmission medium (wired) and wireless (LAN) on the LAN to perform its function.

The design of the proposed network is designed based on the concept of Cisco Three-Layer Model Hierarchial which divides the functions of each network device in accordance with the device layer is located. By applying this concept, can reduce the cost and usage of network devices on Reef Building. Building Corals get SISFO connection service from Telkom University which is the central provider Telkom University. Testing proposed by measuring the QoS parameters in the design of the proposed network. Parameters measured are throughput, delay, and packet loss. Tests conducted by streaming video from the server side and the client side will stream. The QoS parameters will be read by wireshark who will be made an analysis. The environmental impact analysis was measured by using a kWh on each device to produce environmental impact with certain parameters. This is done in order to support the concept of Green network.

Testing using wireshark and GNS3 with throughput, delay and packet loss as a parameter. Results of the proposed network is simulated on 1 user with a value of 1.5 Mbps throughput, delay value of 0,015s and packet loss value of 0%. Simulations on 5 user with a throughput of 1,9Mbps value, the value of 0,029s delay and packet loss value of 0%. Simulation on 10 user with the value of 3,4Mbps throughput, delay value of 0,036s and packet loss value of 0%.

Keywords: wired and wireless transmission media, Cisco Three-Layer Model Hierarchial, QoS, Green network