

## **ABSTRACT**

Yayasan Kesehatan Telkom (Yakes Telkom) is a health care management organization under the Telekomunikasi Indonesia company. Yakes Telkom using LAN network infrastructure to provide health service. Conditions of LAN infrastructure at Yakes Telkom 2017 are the lack of standardization both of the LAN and layout of the network device. The existing LAN infrastructure topology consists each of router connected to layer 2 switch and directly connected to the computer (single link). That conditions can lead the problems if an interruption occurs in the switch, it will cause the entire computer can not connect to the network caused there is no redundant link. Yakes Telkom not yet implemented bandwidth management according to the needs of each network user. Yakes Telkom needs LAN infrastructure design using Cisco Three Layer Hierarchical Model that can be applied by dividing the functions of each network device according to core, distribution and access layer of the device is located. NDLC (Network Development Life Cycle) is used as a method in design of network infrastructure because it is repeatable and sustainable development of the network infrastructure in organization. NDLC stages used in this research are Analysis, Design and Simulation Prototyping. Result of this research is design of LAN infrastructure of Yakes Telkom Bandung by applying redundant link. Measured of QoS (Quality of Service) with throughput parameters that generate values for application high category 335 kbps, medium 211 kbps and low 76 kbps. The delay time of 0.03 s is included in both categories according to ITU-T G1010 (The International Telecommunication Union-Telecommunication) and 0.56% packet loss according to TIPHON (Telecommunications and Internet Protocol Harmonization Over Network) standards.

**Keywords:** LAN, Cisco Three Layer Hierarchical Model, NDLC, QoS, redundant link bandwidth management, Yakes Telkom