

## **ABSTRACT**

*Nowadays information technology is increasingly sophisticated and has become a very related thing to every human activity. Information technology can be accessed to process data, including obtaining, compiling, processing, storing, and even manipulating data which can then produce quality information for human use. Bandung District Government is a government affair that regulates all the needs of the community in the Bandung District area. In Bandung District Government has several SKPD in internal space, one of which is DISKOMINFO. DISKOMINFO is an institution that manages all infrastructure and manages information systems that exist in Bandung District Government. The condition of the cable network infrastructure in Bandung District Government has implemented fiber technology. But in the current conditions, the network infrastructure is still not optimal because there is no equal bandwidth distribution between SKPDs and there are no standards used in the design of the current network infrastructure.*

*Optimization and design of new cable network infrastructure using the Network Development Life Cycle (NDLC) method with the stages of Analysis, Design, Simulation & Prototyping. The design process of network topology design is validated by using GNS3 as a simulator for completing network infrastructure to reduce the problem or risk that arises in questioned networks after being applied to this design. Design and simulation design by implementing Cisco Hierarchical Three Layers Model which consists of three layers, namely the core layer, distribution layer and access layer.*

*Test parameters using QoS analysis are throughput, delay, and packet loss as test parameters. The test results get better results compared to existing conditions, namely during busy (peak time) the previous throughput value is 158.05 kbps to 362,747 kbps, then the previous delay is 0.0081 seconds to 0.0034 seconds and the previous packet loss is 2.98 % to 0.016%, for leisure time the previous throughput value returned 168.105 kbps to 397.201 kbps, then delayed 0.0081 seconds to 0.0034 seconds and the previous package loss 1.2% to 0,%. The test results are included in the excellent category. In this research analysis of logical network topology and the use of network devices to support full optical fiber technology in Bandung District Government*

*Keywords: Information Technology, Information Systems, Network Infrastructure, Cable Networks, GNS3, Bandung District Government, Cisco Three-Layered Hierarchical Model, Bandwidth, Quality of Service, NDLC*