

## ABSTRACT

Forest and land fires are a condition where forests and land are hit by fire, resulting in damage to forests and land which causes losses because it often causes smoke disasters which can disrupt the activities and health of the surrounding community. The Ministry of Environment and Forestry has made various efforts to prevent and deal with forest and land fires to minimize the occurrence of forest fires by implementing a detection system, namely monitoring, patrols in forest areas and also with the SiPongi application which can monitor fires with satellites. Detecting fires in remote areas with satellites can be hindered by cloud cover and to detect forest fires earlier some researchers propose new solutions that utilize IoT sensor networks.

This time's research is to monitor IoT-based forest fires by using sensor testing tools including fire, temperature, and humidity sensors, as well as smoke sensors and also using LoRa then will read and manage sensor data then sensor data is integrated into Antares. By being able to display data to Android applications and display sensor reading parameters to applications that can monitor forest conditions.

The result of this research is that testing each sensor is successful in reading sensor data. In testing the Android application, it succeeded in displaying 3 conditions, namely unsafe, alert, and safe results. The packet loss test obtained the highest score at night, namely 37.65%, and the lowest value during the day, namely 1.24%. The throughput test obtained the highest value at night, namely 278 kbps, and the lowest value during the day, namely 7.8 kbps. The delay test obtained the highest value in the morning, namely 110.95 ms, and the lowest value at night, namely 18.09 ms. The average LoS value at RSSI is -94.9 dBm and the average NLoS value at RSSI is -94.1 dBm. The average LoS value at SNR is -3.175 dBm and the average NLoS value at SNR is -4.468.

**Keywords:** *Forest Fire, IoT, LoRa, Android Apps*