This research builds a Localization System using Long Range (LoRa) Network. This research also analyzes the performance of the positioning method in the Low-Power Wide-Area Network (LPWAN). LPWAN technology is radio-based communication that low power usage and wide area coverage. The method that analyzes in this research is the combination of the Received Signal Strength Indicator (RSSI) with the Trilateration Method. This research also filtered the RSSI value using the Kalman filter method for smoothing data. The localization system traditionally based on Global Positioning System (GPS) device. However, GPS technology not working well in Non-lineof- sight (NLOS) like an indoor location or mountain area. The other way to implement the localization system is by using LoRa technology. This technology used radio frequency to communicate with each other node. The radio frequency has a measurement value in the form of signal strength. These parameters, when combined with the trilateration method, can be used as a localization system. After implementation and testing, the system can work well compared with the GPS system for localization. RMSE is used to calculate error position on these methods, the result from three methods used, the value from RSSI with Kalman filter have a close result to actual position, then value GPS follows with close result from Kalman filter, and the last one is RSSI without Kalman filter.