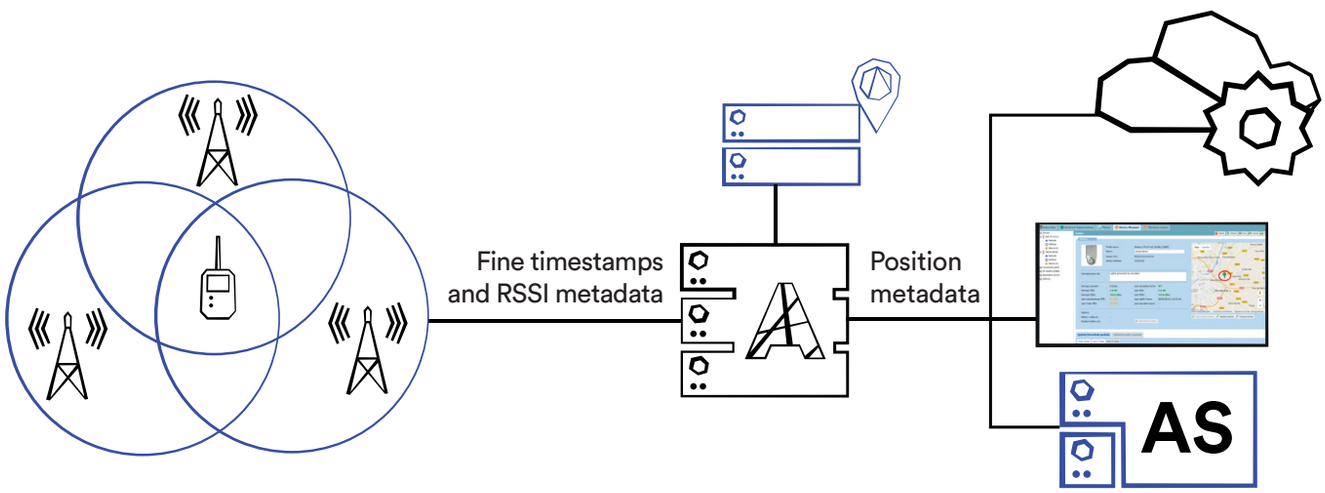
ThingPark Location

Complete solution combining LoRaWAN gateways and solver software for locating non-GPS devices, based on TDoA algorithms

LoRaWAN can leverage TDOA-based (Time Difference of Arrival) triangulation to calculate the position of the device. The LoRaWAN device needs to be « covered » by 3+ gateways. Each gateway receives data from the device, timestamps it and forwards it to a geolocation solver along with other metadata. The Actility network geolocation solver collects the multiple timestamps to estimate the position for the device using triangulation based the differences between multiple timestamps. A precise time-synchronisation mechanism (usually using GPS) between gateways is necessary to achieve nanosecond precision in time measurement.



Gateway decodes time-synchronised fine timestamps	Network servers interact with location solver to get position estimate	Network Geolocation solver computes position based on TDoA and RSSI	ETSI compliant interface to a network Application Server

Key benefits

Price	• No need for GPS receivers enables lower cost solutions (GPS adds 5-10$ cost to BoM)
Power consumption	• Power consumption is very low as no GPS is involved and battery life can be months-years (depending on traffic profile)
Any LoRa device	• Works natively with any LoRa device, even without any dedicated location hardware, with a precision between 20 to 200m depending on radio propagation conditions
Multi-technology	• Can be combined with other location technologies such as GPS, Wifi SSID or Bluetooth low energy to adapt precision level to situation requirements • Can integrate data from other sensors such as accelerometers, magnetometers etc. for data fusion to enhance location precision