IoT in seismology: real-time transmission methods

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Abstract

Nowadays the great challenge for specialists in communication networks and seismologists is to achieve an efficient data transmission in the adverse conditions where the seismographic stations are deployed.

The transmission (or telemetry) of seismological data is gaining more and more prominence in the world, since it is an essential point for the effectiveness of Earthquakes and Tsunamis Early Warning System, as Seiscomp3, the system used by the 5 groups (USP, UnB, UFRN, National Observatory and CPRM) that constitute the Brazilian Seismographic Network (RSBR, Rede Sismográfica Brasileira).

The RSBR has 85 seismographic stations, where many of them transmit data in real time and probably by the end of 2019, all stations will be online. USP Seismology Center manages 50 links (of 85), using three transmission methods: Very Small Aperture Terminal (VSAT/Satellite), 3G/2G (mobile), WISP (Wireless Internet Service Provider).

The definition of the best method for transmission is always a recurring topic of discussion. Finding metrics, evaluating available alternatives to the location, monitoring performance and budget adequacy are basic items for choosing the technology to be used for each station.

Another aspect to be emphasized when it comes to real-time transmission is the remote monitoring and management of equipment, reducing downtime, correcting problems of simple settings or adjustments, making the network or system of which the station is most effective.

The choice of the best transmission technology is essential to meet a basic premise of the RSBR and other projects of the Center, to have the highest availability of transmission links possible. Benefiting researchers in Brazil and in the world, besides society when there is a significant event, with the sharing of data in real-time.