OpenWeather protocol for efficient real time measurement data distribution in weather sensor network

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In this presentation we will introduce **OpenWeather**, a novel-prototype network protocol designed to provide access to real-time data in weather sensor networks. The core design of OpenWeather brings a new methodology to transmit and interact with the automatic weather stations. Through a peer to peer architecture, every node is able to transmit the sensor data in real-time and assuring the integrity and delivery of the data.

The motivations behind OpenWeather are the replacement of the current network protocols used in the automatic weather stations. The available solutions used to acquire weather data, require different time frequencies and delays for the data collection. In addition, the currently used network protocols on the weather data transmission have not been adapted for this specific purpose.

Thus, the availability of real-time weather data is limited by the non-adapted methodologies, concerning network data transmission.

We propose a new protocol adapted to these scenarios. OpenWeather makes possible to remove some bottlenecks in weather sensor networks, providing a new methodology to build scalable and reliable networks, avoiding the implementation of intermediary nodes to process the weather data. Hence, OpenWeather can provide a new way to improve the technologies utilized in weather measurements. Because OpenWeather has its foundations over a distributed model, it can be utilized to build large weather sensor networks. A functional prototype has been implemented and tested, adapting it to common automatic weather stations.

Most Earth observation applications rely on accurate in-situ measurement network on the ground, including weather station networks. Thus, OpenWeather can be a new solution to provide real-time weather data, without strong modifications in the current weather sensor infrastructures. In addition, a new paradigm is proposed based on the distributed models applied to remote sensing technologies, providing the hints to implement scalable networks utilizing sensors as main source of data.