



## **istSOS3 – Open, interoperable and IoT integrated sensor data management system**

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istSOS ([www.istsos.org](http://www.istsos.org)) is an OGC Sensor Observation Service server implementation written in Python with a user friendly interface and rich feature collection to easily manage your sensor network and distribute your data in a standard way. To offer a system that represents the latest state-of-the-art in data acquisition and management in monitoring networks and IoT in the last year istSOS underwent a complete code rewriting. While integrating the current flagship techniques like asynchronous programming and a component-based development the new version continues to be based on the istSOS pillars: Python programming language, Sensor Observation Service standard, lightweight and easy to use application.

With respect to the previous versions, istSOS3 (version 3), has been designed to enhance its quality of service (performance, capacity and availability) that previous researches individuated as a blocking factor toward big-data support and high concurrent applications. For this reason the data storage has been abstracted to potentially comply with any data structure and the default PostgreSQL data model has been optimized for data retrieval. Additionally, taking advantage of the asynchronous programming the access to the information is boosted increasing the performance and responsiveness under high load conditions.

To increase the software flexibility, adaptability and expandability the developers selected a component-based architecture. The core of the software is based on a chain-of-responsibility pattern where basic actions and entities can be reused and combined to fulfill different users requests. Similarly, web based core components were built to make complex user interfaces based on their combination. This approach facilitate the istSOS community in creating new add-ons that extend the core functionalities and interfaces by adding useful features to the software for benefit of all the users.

This contribution introduces the istSOS3 illustrating the technical details of the new software architecture and the new features and users opportunities. Furthermore, it show the improvement in term of quality of service by comparing performance and service metrics with respect to the previous version. Some new applications that take advantage of the renewed code are finally described and presented.

Specific used open technologies include: Python3 with asyncio, aiopg, lxml, jsonschema, psycopg2 and tornadoweb modules; PostGIS/PostgreSQL 9.4+ database; reactjs, OpenLayers3, SemanticUI JavaScript/CSS libraries; Babel JavaScript compiler; npm package.