

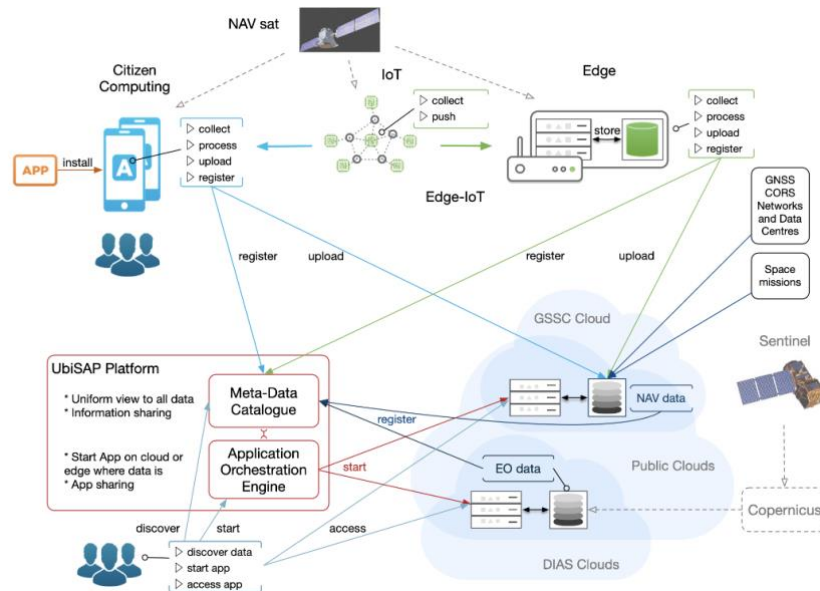
Ubiquitous Science Analytics Platform for IoT (UbiSAP)

Abstract

ESA operates a wide range of missions, including Navigation, Earth Observation, Space Science, and more. ESA activities in these domains produce a significant and ever-increasing amount of data, both from a scientific and operational standpoint. In order for ESA to maximise the impact of this data, it must not only be easy to find and exploit but also easy to integrate in an effective way. With tools to do this, ESA will realise its full potential, including being able to cross-fertilise data exploitation with a whole range of space and non-space organisations. The scientific and citizen-centric applications for this goldmine of data are endless. The main motivations behind the ESA's UbiSAP project were

- to demonstrate the feasibility of a platform that is able to leverage multiple existing ESA infrastructures, such as GSSC Now for Navigation data discovery and exploitation, and DIAS (Data and Information Access Services) for Earth observation;
- to capture GNSS measurements from Edge-IoT devices and citizen crowdsourced data from Android smartphones and upload the data to the platform for catalogisation and processing.

To realise these goals, SixSq (prime) and GMVNSL have leveraged on SixSq Nuvla and NuvlaEdge software to implement the UbiSAP Platform. The Kubernetes container orchestration engine was used for running the platform and the on-demand provisioned data processing clusters. Furthermore, the replication of GNSS STICK service was used to collect, process, and analyse GNSS data from ground measurements. With UbiSAP providing a single platform to manage data (e.g. location, size type, and other parameters) and its processing (via user-defined containerised applications), users can search, discover and request data analysis at the data location, or at an external federated platform. UbiSAP's holistic view over the data and compute allows users to fuse data and perform cross-domain processing at scale.



We will present the project's results expanding on the architecture, design, implementation, and validation via use cases. We will showcase the platform via a short demo, and conclude with remarks on the immediate future work that will follow the successful results of the UbiSAP project.

Speaker

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