

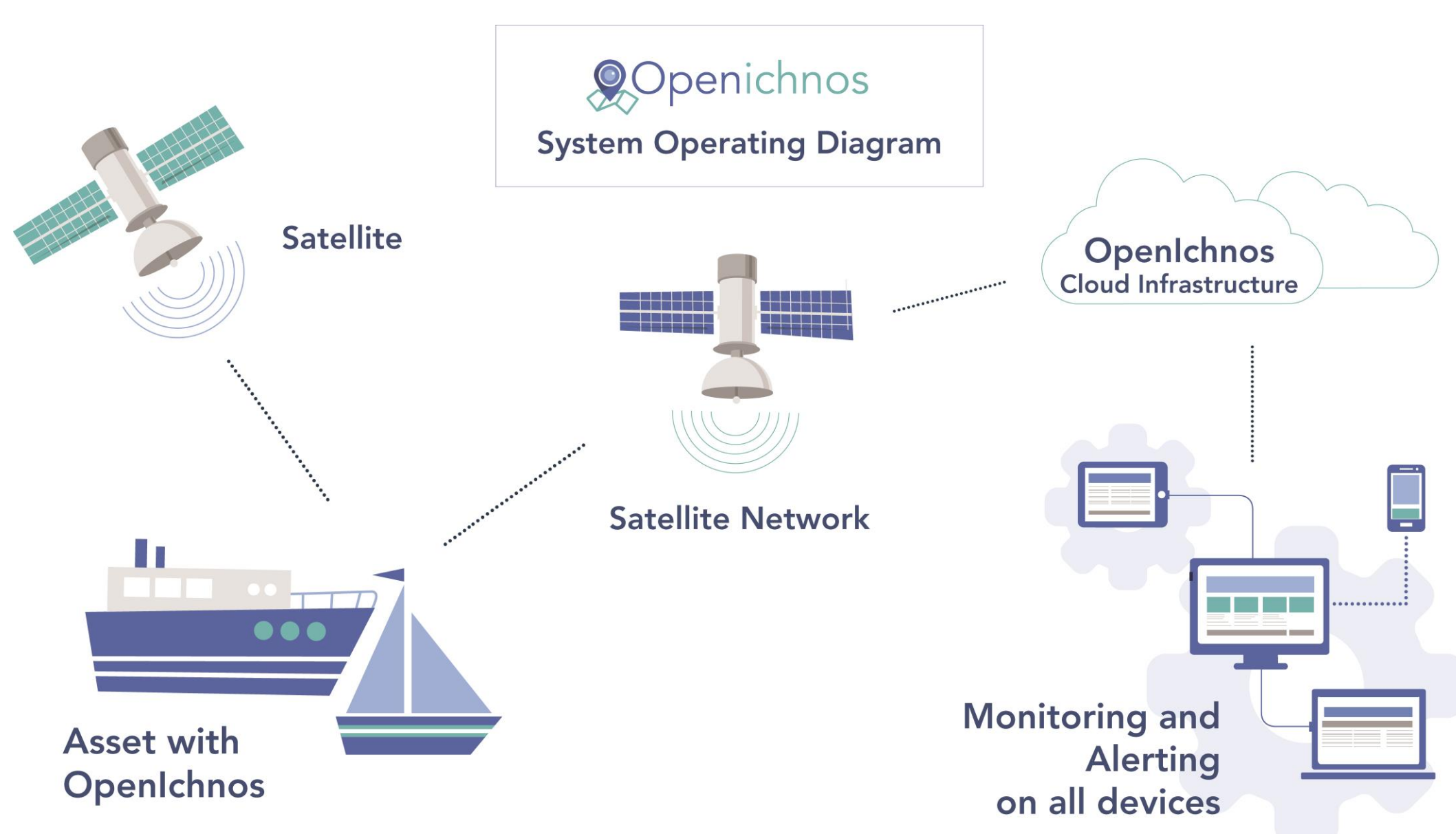
## Leverage tracking efficiency on oceanographic buoys using an energy autonomous solution transmitting satellite messages

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### Abstract

Tracking efficiency on open sea assets is of significant interest in the maritime field. Openichnos delivers an energy autonomous tracking solution which works in truly 100% global scale, using the Iridium satellite constellation for transmitting its data. HCMR's marine monitoring, forecasting and information system for the Hellenic Seas, POSEIDON, has infrastructure such as moored oceanographic buoys which are suitable for long-term testing of Openichnos technology in a harsh sea environment, providing the increase of their coverage percentage and their real time tracking independently from the buoys' main system, acting as backup and emergency system. This collaboration will provide results that can be applicable in the field of marine applications and is a first step for the establishment of a future one in which Openichnos acting as an IoT gateway will also benefit from the buoy main tracking device data transmission as well as meteorological data transmission (wind direction, wind speed, wave height) provided by the POSEIDON buoys.



### VISION AND GOAL OF THE LETS-SAT PROJECT

- Allow the installation of more efficient and sophisticated tracking device on moored oceanographic buoys.
- Increase the efficient tracking in 100% global range.
- Provide a reliable and autonomous primary and back-up solution for the high frequency tracking of the observing platform.
- Increase the efficiency in case of emergency or used as a failover communication device.
- Future research in developing cost efficient observing platforms with low energy requirements and state of the art communication capability.
- Extensive collaboration in applying Openichnos IoT technology

### HOW IT WORKS

#### Track

Openichnos device works in a hybrid way. Its tracking module is regularly triggered, obtaining position based on GPS, GALILEO, GLONASS satellite networks and GSM network.

#### Communicate

Openichnos transmits the corresponding coordinates to Openichnos cloud infrastructure via satellite and GSM networks.

#### Monitor

The routes created from the transmitted positions are fully visualized on the user's dashboard for a convenient and easy monitoring, consisting of position, course and speed information of the asset.

### EXPERIMENTAL PLAN

- Establishment of Openichnos on HCMR's buoys
- Intercomparison-calibration experiments in order to check the accuracy and reliability of the message communication.
- Testing period of 1 year regarding:
  - Energy autonomy of the device
  - Weather proofing of the device under extreme environmental conditions (heat, wave energy, salt)
  - Total endurance in real maritime conditions
  - "Geofencing" that allows the delimitation of specific areas from which if there is an outbound buoy, there will be the appropriate alerting via sms and email.

### FUTURE VISION

Use the results of LETS-SAT project to:

- Extend the usability of sophisticated tracking solutions on the oceanographic buoys among the research community.
- Develop cost efficient observing platforms with low energy requirements and state of the art communication capability.