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Using federated cloud computing services and tools to support ocean search and rescue: A use case of the Lagrangian Ocean Search Targets (LOST) application

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Finding a person (or object) lost at sea is like looking for a needle in a haystack. Improving the procedures and the efficiency of search and rescue operations will assist us with saving lives and locating valuable objects that have been lost in the ocean. There are currently a range of techniques for locating objects in the ocean, from people using their experience of the ocean to make rough estimations, to scientists using numerical model outputs to estimate the position of the object.

With the idea of optimising the search and rescue operations, for both people and objects, we have developed a virtual particle tracking application called LOST (Lagrangian Ocean Search Targets), which is built upon the OceanParcels framework. It has been adapted to provide real-time estimates of the positions of objects based on numerical model outputs and satellite observations. It shows the pathways and location of virtual objects in the global ocean.

The web-based LOST application allows users to enter the coordinates (longitude and latitude), select an object type [ranging from marine organisms, persons wearing life vests, to capsized boats] and run a real-time simulation, providing a range of analytics supporting search and rescue operations.

LOST aims to target a wide spectrum of users ranging from local authorities to scientists to the general population. The main goal of LOST is to continuously improve the scientific integrity of the underlying science to produce analytics that are useful to users in real-life applications. A major focus is to develop a user-friendly interface that is available 24/7, that provides an easy-to-use application for non-specialists, to support their operations.

The datasets required to run LOST, are distributed and slow access causes a delay in the production of analytics on the fly. In this presentation we discuss the effort and challenges in running LOST on the EGI e-Infrastructure using Docker and Kubernetes. We put forward suggestions on how to improve the user experience in order to lower the technology threshold for future users.

Type of abstract

Presentation

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