

# MyWay : a real time vessel tracking and cruise events system

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ENEA is a member of the National Programme of Antarctic Research (PNRA) funded by the Italian Ministry of Education, University and Research (MIUR). The government programme has instituted 32 national oceanographic campaigns in Antarctica and has developed many scientific and technological activities in which research centres and universities have participated.

The scientific personnel on board belong to different research institutes and organisations. The teams are involved in projects related to various disciplines such as meteorology, geology, physical, chemical oceanography, geological and marine biodiversity.

The MyWay system, used in the Antarctic cruises since 2014, is a set of hardware and software that, in an integrated way, ensures all the functions necessary for carrying out the activities of the Navigation Laboratory:

- acquisition and real-time display of vessel position data and weather and sea conditions;
- storing the data acquired in a geographic database;
- visualization of the cartography of the operative area with the information useful for navigation:
- trace of the ship;
- ice maps;
- satellite images;
- position of the scientific activities carried out and planned;
- automatic and periodic sending of the vessel's position by e-mail to addresses definable by the system itself;
- automatic and periodic sending of the vessel's position to the Ship Position Reporting System (SPRS) of the COMNAP.

The block diagram of MyWay is shown in Figure 1, which highlights the subsystems that compose it: measuring, processing and visualization.

The system architecture was designed with the intention of separating and rendering its parts independent, delegating to the local network the task of making functional connections. Following this approach, the data generated by the measuring instruments are injected into the LAN, making them available to all the devices that access the network, regardless of the presence or operations of the other components of MyWay. The heart of the system (processing) consists of a java web application that acquires data from the LAN, displays them in real time and stores them in a geographic database. A series of all-in-one personal computers (visualization) allows you to access and view information concerning navigation. The "core" of the processing section consists of a virtual machine with Linux Ubuntu 16.04.4 LTS operating system hosted on VMWare vSphere platform. The MyWay three-tier web application runs on it. The application, built with Java technology, has an architecture based on the MVC model, implemented thanks to the Struts framework. Made entirely with open-source software, from a functional point of view, MyWay can be considered a web-GIS associated with a nautical satellite navigator. Being a web application, both its control and access to data and