

MARVELOWS

Maritime Applications exploiting Reliable VHF data Exchange **LOW** cost System

MARVELOWS Demo Project

Abstract

The objective of the MARVELOWS Demo Project is to verify and validate on field the so called “Dematerialization Service Platform”.

The **Dematerialization Service Platform (DSP)** was born taking into account eNavigation Maritime Service Portfolios (MSP8, MSP11, MSP12, MSP15) and has been thought as a new application infrastructure allowing National Hydrographic Offices (NHOs) to provide new digital services not limited to the distribution of information already provided by current official nautical charts or publications and focused on simple and local ‘updates’, ‘overlays’ and ‘info-messages’.

The MARVELOWS DSP pillars are two:

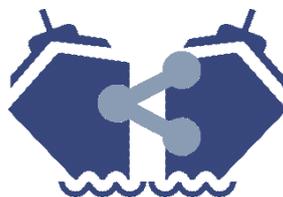
1. a Multichannel Communication Infrastructure
2. a Location-based Compressed Data Delivery System

The Multichannel Communication Infrastructure shall leverage on the capability of the DSP to use the most appropriate communication channel among the available ones, both in the near-sea and in the deep-sea. Moreover it shall benefit of a new communication channel, i.e. the VDES, a VHF Data Exchange System whose standardization process is still in progress. VDES addresses the needs for additional capacity for digital data exchange to support enhanced Navigation (e-Navigation) maritime data. The main advantages with respect to current existing solutions for the maritime community would be:

- A native hybrid terrestrial and satellite technology
- A cheaper solution for a low volume data broadcast on a global level;
- An easier on-board equipment integration, together with the mandatory or at-least recommended AIS equipment; and
- A common shore/ship/space exchange system shared by both institutional and commercial users, with the long range of VHF.

The Location-based Compressed Data Delivery System shall leverage on the capability of the DSP to receive Positioning Status Reports [MSP8, MSP15] from subscriber vessels, to ‘forecast’ the future position of navigating vessels and to manage the so called Nautical Service Areas (see the picture below - Italian Use Case) for multicast delivery of geo-referenced service data [MSP11, MSP12]. The following list summarizes the main characteristic of the DSP delivery system:





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1. Subscribers shall have a 'user profile' correlated to the type of service data to be delivered
2. Service Data are transmitted to mobile destinations (vessels, ships, boats) taking into account current and future positions of the vessels and Nautical Service Areas
3. Common data, i.e. data interesting more than one vessel within the same Nautical Service Area, now or later, shall be transmitted once.
4. Data transmission is scheduled so that data are available when they need: speed is not the driver.
5. Data transmission is unstructured and compressed, even taking into account the need to respect the compliance to eventual standard on the source and the destination views.



Picture 1 – Italian Nautical Service Areas (P1, P2, ..., P8)

The following type of Service Data can be delivered:

1. **Coastal and Harbour data**: local data and/or data owned by the NHOs and not included in ENC chart, such as:
 - coastal views,
 - harbour plans,
 - approaches to harbours,
 - anchorages even with Multimedia contents (es. Harbour photos and/or videos).





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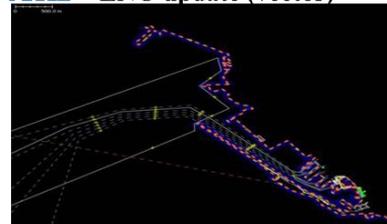
2. Navigation support data: additional information owned by the NHOs and not included in official ENC and NPs
 - ENC overlay info & update
 - NPs-Nautical Publications update;
 - Local NTM-Like messages, including navigational aids

3. Third-parties data, digital information gathered form external sources and supporting the navigation (e.g. relay of information provided by the Coast Guard):
 - Specific Weather info (including Harbour Meteo Stations),
 - News (relevant to the navigation)
 - Info Warnings and Info Alerts

Before transmission, DSP Service data are put together to form the ‘Geo.Info.Packages’, i.e. a package of compressed data related to a certain geographic area. A simple example of Location-based Compressed Data put together within the so called compressed is provided.

Geo.Info.Package ID	Size [KB]	Content
Geo.Info.Package 1	~50	9 Nautical Publication Update 1 ENC update/overlay + 3 Nautical Publication Update
Geo.Info.Package 3	~150	1 Photo + 1 ENC update/overlay + 3 Nautical Publication Updates 3 ENC updates/overlays + 9 Nautical Publication Updates 2 Photos +
Geo.Info.Package 5	~250	1 ENC update/overlay + 3 Nautical Publication Updates 1 Photo + 2 ENC updates/overlay s+ 13 Nautical Publication Updates

32KB – ENC update (vector)



66KB – Photo (930x320 pixels)

