Open Vessel Data Management

Open-source software to assist vessel operators with the task of ship-wide data management.

What is OpenVDM?

The Open Vessel Data Management project (OpenVDM) is suite of programs accompanied with a web-application that provides vessel operators with a framework for managing the raw data files and data products created during oceanographic research cruises.

OpenVDM automatically transfers raw data files and products to a centralized ship-board repository and organizes those files based on the ship operator's defined data management plan.

OpenVDM provides shipboard scientists and crew with safe access to all data files within minutes of it's creation.

OpenVDM is entirely configured and controlled via it's web-application. Potentially allowing system management from anywhere on the vessel's network.

OpenVDM includes a plugin architecture, software hooks and a RESTful API that allows vessel operators to extend OpenVDM's functionality with custom QA tests, stats collection, custom data visualizations, automated triggering post-processing routines and vessel-specific data displays.

Where did OpenVDM come from?

The origins of OpenVDM started in 2010 aboard the *NOAA Ship Okeanos Explorer*, the first vessel purpose outfitted to conduct telepresence-enabled ocean exploration.

Implementing the telepresence paradigm required providing ship-based and shore-based scientists with the information needed to make an operational decision quickly and consistently.

To meet this challenge a rudimentary ship-wide data manage system was developed that automatically copied and organized all collected data to a central shipboard server. A second server was configured on shore and the relevant subset of collected data was synchronized between the two servers, thus providing data access to the shore-based scientists.

After several years of proven value to the *Okeanos Explorer*, the primary developer replicated the system's functionality as an open-source software project and re-branded it as OpenVDM.

The first vessel to utilize OpenVDM was the *R/V Falkor* operated by the Schmidt Ocean Institute starting in fall 2013.

How is OpenVDM Supported?

The software is freely available but thus far the host institutions of all vessels using OpenVDM have supported the project by hiring the developer to perform the initial system install.

Recognizing the potential value of the project to the global oceanographic community, the Schmidt Ocean Institute has graciously providing ~35% of base funding since Fall 2014.

The Impact for Marine Sciences:

Having data consistently organized and instantly available to scientists improves at-sea productivity.

Having an automated system reduces time required of marine technicians to manually managing data.

Automated vessel-specific QA tests and near-realtime data monitoring helps detect data problems and thus improved data quality.

Standardized end-of-cruise data product streamlines workflows for submitting data to archives.

Being freely available software, OpenVDM substantially reduces the costs for vessel operators wanting to implement an automated data management solution.

As the project sees greater adoption, feedback from users will continue to help improve OpenVDM's performance and help expand it's core functionality.

OpenVDM's Additional Features:

Provides safe location for scientist and crew to share files

Mechanism to automatically copy subsets of cruise data files and data products to a shore-based server.

Mechanism for automatically creating copies of the cruise data directory. (i.e. a shipboard backup server, scientist provided external HDD, etc)

Automatically generates a manifest of all files collected along with an MD5 checksums (for verifying data integrity post-cruise).

Support for vessels with dedication underwater vehicles as well as support for mobile vehicle systems.

Licensed as a GPLv3 open-source software project and freely available with installation instructions from GitHub.

Designed to run on the Ubuntu 16.04 LTS Linux Operating Systems

What's on the Horizon for OpenVDM?

The current version of OpenVDM is 5 years old. Plans are underway to develop a new version of OpenVDM that hopefully will release in 2020.

For More Information About OpenVDM:

Source: https://github.com/webbpinner/OpenVDMv2
Demo: http://openvdm.oceandatarat.org
Email: webbpinner@gmail.com