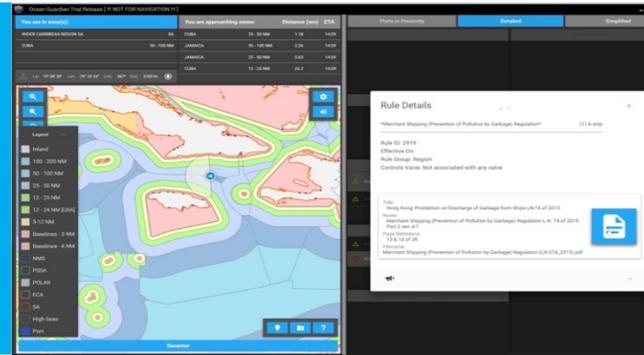


# Ocean Guardian powered by Diffusion, Assures Vessels' Environmental Compliance & Protects the World's Oceans.



## Quick Facts

When Brenock, a software company specializing in shipping industry application development, sought a data platform to power the Total Marine Solutions Ocean Guardian system, that could assure maximum operational efficiency and reliable delivery of the critical environmental compliance data for ocean going vessels, they turned to Push Technology's Intelligent Data Platform, Diffusion, as the ideal solution.

## Industry

- Transportation/Shipping

## Challenges

- Assure international environmental regulatory compliance.
- Maximize operational efficiency.
- Deliver timely & reliable information worldwide.

## Solution

- Push Technology's Intelligent Data Platform, Diffusion™.

## Benefits

- Simple application integration.
- Reliable shipboard communications.
- Critical environmental regulatory compliance.

## Overview

Ocean Guardian, developed by Brenock Technology for Total Marine Solutions, simplifies and streamlines environmental compliance for ocean vessels. The system combines highly accurate GPS technology with TMS's comprehensive, custom maritime environmental regulatory database and the system is built to handle any size fleet.

The Ocean Guardian system supports environmental operations and their clients' goals. It provides shipping operators and owners with immediate and accurate information on environmental regulations pertaining to a vessel's specific location and provides the tools to facilitate compliance throughout their fleets. Ocean Guardian brings environmental compliance into the 21st Century.

## The Challenge

When developing the Ocean Guardian system, Brenock's technical team had to address three areas of concern:

1. Assure efficient, cost-effective, and reliable delivery of information from a shore-side server to each individual vessel via sometimes difficult satellite connections, in a Microsoft Windows environment.
2. Synchronize and integrate the changing Ocean Guardian system data including vessel GPS location, international regulatory data, and port proximity data.
3. Seamlessly scale and manage usage for hundreds of ships per

## The Analysis

The Brenock development team examined a variety of options to address the data synchronization, management, and delivery challenges for the Ocean Guardian system.

The team began by analyzing the pros and cons of using two open source options – Kafka and RabbitMQ - versus Push Technology's Diffusion. In the words of Brenock CTO, Ben Rogers, the technical team's conclusions were:

“When Kafka is used within an Enterprise, Internet communication is less reliable than when using Diffusion. Basically, Diffusion can handle an Ocean Guardian server with many devices connected via the Internet – not just within an organization. This is a situation we must manage when a shore-side user is on a tablet or laptop connected to a hosted instance of the server showing the locations of hundreds of ships via GPS feeds. In addition, Kafka runs in Apache and is difficult to configure in Windows environments. Kafka was designed to run on Linux and only runs on Windows by installing a 3rd party helper application.”

*“Ask anyone on our development team, and they will tell you that we made the right choice using Diffusion. The performance is great. Error handling and connection monitoring are well-defined and allow us to check for connectivity and to reconnect to the server reliably. Support is fast and helped us get up and running quickly.”*

*Ben Rogers, CTO, Brenock*

Rogers went on to say, “With RabbitMQ, scalability and data types are an issue. RabbitMQ is fine for sending strings and messages but it does not handle more complex operations like JSON serialization, error handling, and reconnection strategies that Diffusion manages. We have used RabbitMQ in the past for simple data sets and strings but sending something like a set of rules for a port is too challenging and time consuming to unpack and de-serialize.”

### **The Solution**

Based upon Brenock’s evaluation and analysis of the platforms and product options for data management and distribution, including free open source products, Rogers summarized, “We determined that Diffusion is powerful and also gives us ease of setup, multiple message types including Binary and JSON, which speeded our development, and a support desk that is unavailable with the open source products. “

He explained additional high-value functionality of the Diffusion platform saying, “Diffusion’s broad feature set is a perfect match for the challenges that Ocean Guardian had to address to be successful. Rogers further commented, “Diffusion has unique features including only sending message deltas and compressing messages. This maximizes efficiency both when the regulatory rules don’t change when a GPS changes, and with the size of our messages when the regulatory rules do change when a GPS changes.”

### **The High Value of Support**

Rogers stressed the importance of high quality and timely product support to shorten the development cycle and time-to-market. The Brenock team integrated the Diffusion intelligent data platform into Ocean Guardian and demonstrated the system in a week.

Rogers said, “Push Technology’s support is fantastic and every technical hurdle we faced with handling Ocean Guardian data and connectivity is addressed. The Push support team also helped us to plan for an environment of one ship scaling to hundreds of ships on a single server.”

### **The Outcome**

Diffusion’s unique benefits are a boon to Brenock’s busy development team. With Diffusion powering Ocean Guardian by reliably and efficiently synchronizing, managing, and distributing the data, the Ocean Guardian server application, written by Brenock, only needs to retrieve and format the data once, when a ship’s GPS location changes. Diffusion gathers all the data and distributes the pertinent information, to the shipboard devices when they connect. The Diffusion platform sends only data changes as a ship’s GPS location changes – optimizing operating efficiency and system reliability.

*“Without Diffusion, the Ocean Guardian system would be performing unnecessary, repetitious work for every shipboard device connected, wasting valuable memory and CPU processing power - increasing operational costs.”*

*Ben Rogers, CTO, Brenock*