

Hong Kong's Vessel Traffic Center Gains Real-Time Port Operations Visibility



Executive summary

The Marine Department (MD) plays a vital role in achieving safe port operation within Hong Kong waters. MD provides vessel traffic services through its Vessel Traffic Center (VTC). Previously, VTC relied on operators juggling between an electronic system, MIS and paper records to track vessels and monitor traffic. Since the Splunk Enterprise analytics platform came into play in 2016, MD has seen unprecedented benefits including:

- Boosted business efficiency due to automated vessel tracking reduced from tens of minutes to seconds
- Facilitated operation due to real-time, end-to-end visibility into the marine traffic
- Enhanced public image due to improved navigation safety and traffic efficiency

Why Splunk

Hong Kong waters is divided into four sectors for monitoring by individual operators. In the past, while focusing on marine traffic on radar displays and via other electronic systems, operators also had to manually input vessel activity records and search through piles of paper to retrieve data and then pass the relevant documents to the next operator when vessels moved across sectors. To go the extra mile in operational accuracy, efficiency and support future growth, MD decided to revamp the whole system.

Splunk Enterprise turned out to be an ideal solution, not only fulfilling all functional requirements, but also flexibly accepting data in different formats and means. With Splunk Enterprise, MD has created one of the world's first fully automatic vessel tracking systems, according to Gordon Yuen, information technology manager, Marine Department of the Hong Kong Government.

Industry

- Transportation

Splunk Use Cases

- Business analytics
- Internet of Things

Challenges

- Labor-intensive manual workflow for vessel tracking
- Error-prone data processing
- Potential delays and incomplete data analysis in traffic monitoring

Business Impact

- Optimized operation with boosted vessel tracking accuracy with real-time, end-to-end visibility
- Enhanced business efficiency with accelerated vessel tracking under a fully automated operation
- Reinforced corporate responsibility due to increased eco-friendliness through paperless operation
- Improved public image and reputation due to proven excellence in marine services with improved safety and efficiency
- New business opportunities with cross-region marine service collaboration achieved by flexible data sharing

Data Sources

- Incoming stream of track data from radars and automatic identification system (AIS)
- Outgoing vessel and trip data
- Application logs (access logs, system logs, event detection logs)

Splunk Products

- Splunk Enterprise

End-to-end visibility creates new possibilities

Splunk Enterprise enables MD to monitor movements of visiting vessels in and around Hong Kong waters in a revolutionary way. It collects and indexes big data in real time from radars and an automatic identification system (AIS) and integrates data from various sources for traffic analysis. The operator then distributes navigational information and advises vessels through a very high frequency radio network to facilitate safe arrivals and departures.

This round-the-clock, end-to-end visibility into the marine traffic enables automatic vessel identification, in-bound and out-bound traffic tracking, real-time event detection, statistical analysis and operational anomaly detection. Moreover, the historical route of the vessels can be instantly visualized on a map. Trends, patterns and statistics are shown clearly in graphical charts, and all queries are handled in seconds. Never before has this kind of all-around, real-time big data collection, analysis and application model been put in place in the local marine transportation industry.

Full automation and paperless operation raises productivity

Splunk Enterprise provides the analysis platform for automating manual, paper-based procedures into a few clicks on the screen. Vessel tracking time has been reduced from tens of minutes to seconds. Operators have been relieved of stressful manual work, reducing human error. Now, they can concentrate on the vessel traffic and offer just-in-time advice to mariners, achieving more efficient and effective port operation. Updates on each system are mostly transparent to the operators and interruptions are minimized.

“Splunk has impressed us with its exceptional flexibility and data processing capabilities. It helps us bridge the electronic system and MIS and provide deep insight into the data, giving us confidence to have a strong foundation between systems. The result is to achieve real efficiency in our daily operations.”

Gordon Yuen

Information Technology Manager

Marine Department of the Hong Kong Government

The system also supports full text search but requires no pre-defined schema. It simplifies add-on development in various means including scripting and web services. Users can, for the first time, search, explore, navigate, analyze and visualize all data through the web browser interface.

Real-time insights boost navigation safety and efficiency

Data collected in real time are examined and applied for estimating vessels' time of arrival to critical locations, which helps operators better coordinate the traffic and minimize congestion. Built for the practical situation of Hong Kong as a busy port and established in accordance with evolving international standards, the system reinforces Hong Kong's position as an international maritime center.

Forging ahead with cross-region collaborative initiatives

MD is also planning to create a vessel data sharing platform with ports in Pearl River Delta to enhance mutual traffic operations, which helps strengthen regional traffic management, standardize ship traffic flow, prevent traffic accidents and protect the environment from pollution.

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