Today’s maritime environment hosts a variety of potential threats to national security and the safety and economic security of global states depends largely upon the secure use of the world’s oceans. The infrastructure and systems that span the maritime domain have increasingly become both targets of and potential passageways for dangerous and illicit activities. Moreover, much of what occurs in the maritime domain with respect to vessel movements, activities, cargoes intentions, or ownership remains often difficult or time consuming to obtain. Global Maritime Domain Awareness (MDA) is increasingly a key strategic requirement for naval/defence forces, coast guards and port authorities who seek actionable intelligence and proactive security. These authorities have, in recent years, drawn from a number of data sources to build a fused global maritime traffic picture. However, the advent of satellite vessel tracking technology increasingly offers them unprecedented opportunities to correlate information received from other sources, in a more timely and effective manner. With real-time vessel tracking data from exactEarth, customers around the world can expect to make drastic improvements to their maritime safety, security, and use of marine assets.

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Across the poles and everywhere in between, exactEarth has their eyes on our oceans. Knowing the who, what and where of shipping activity is precisely their business. Currently operating their own constellation of nine low-earth orbiting satellites, exactEarth is able to detect the transmitting signals from more than 165,000 active vessels across our oceans. Every ship over a certain gross tonnage is required to be fitted with an AIS (Automatic Identification System) transponder that emits messages containing information like the ship’s position, course, and speed. exactEarth is able to then take those messages, almost eight million a day, and decode them into actionable data for its users. Competent maritime authorities around the world have been loyal to the exactEarth Satellite AIS data service, exactAIS® since the company launched in 2009.

Space-based surveillance
One big advantage of space-based surveillance is that improvements to vessel tracking are consistent across the globe even in the most isolated of waters. Right now, the remote Arctic region’s ice levels are at all-time lows, allowing for an increasing amount of ships to transit through these relatively untouched waters. The ice retreat means Arctic research and exploration ramps up as nations begin to unearth the resources that lie beneath this frigid temple.

Just as ships in the Arctic maneuver around the melting ice caps, off the coast of Australia in the beautiful turquoise waters of the Great Barrier Reef, massive tanker ships are travelling dangerously close to this pristine world wonder. In fact, ships everywhere in the world are dancing around similar environmentally safe zones known as Marine Protected Areas (MPAs), carefully travelling out of harm’s way so as not to disturb the marine life that calls these areas home.

To date, exactEarth has seen their data used by authorities for building credible MDA in a whole host of operational activities. In an ever-changing environment where there is a vital need for the persistent monitoring of human activity to forecast defence challenges, satellite AIS (S-AIS) has become a very powerful
tool in the delivery of MDA to a variety of maritime and geo-intelligence users. The ability to readily know the who, what and when of any transiting vessel is a critical piece of intelligence to understand for example if a ship approaching national coastlines participated in an open-ocean rendezvous days earlier. S-AIS provides that knowledge for any area of interest and has been a benefit for maritime operations, whether it’s monitoring protected areas, guarding territorial borders or combating illegal fishing.

Starting with just one satellite, exactEarth is now able to provide complete global coverage with their current exactView constellation of nine satellites, but this is only the beginning. Constellation expansion was the major driving force behind exactEarth’s announcement of a new partnership with Harris Corporation, as they will be first to market a real-time (RT) satellite AIS constellation. The new exactView RT powered by Harris will leverage the real-time connectivity of 58 hosted payloads on the Iridium NEXT constellation.

At full deployment, the exactAIS service will be utilizing a combined constellation of nearly 70 satellites, providing a new level of S-AIS data service for real-time global ship tracking. exactView RT will offer customers both data latency and global revisit times under one minute, allowing them to offer truly unsurpassed global ship tracking and maritime information solutions.

“As the recognized satellite AIS industry leader, the Harris announcement further strengthens our commitment to provide best-in-class maritime intelligence solutions to our customers worldwide,” said Peter Mabson, President of exactEarth. “We are thrilled to be able to offer the shortest revisit times and lowest latency for developing true maritime domain awareness. This partnership with Harris will allow us to significantly expand the range of advanced value-added services and information solutions that we can bring to the global maritime market.”

New methods of MDA

The global deterioration in maritime security which has captured so many headlines because of the increased levels of African piracy, the use of the Caribbean by Latin American drug cartels or the growing concerns surrounding maritime activity in the South China Sea have clearly shown that new methods of MDA are needed if these irregular threats are to be managed successfully. Likewise, existing strategic and conventional threats from nations with interests counter to those of the West, such as in the Arabian Sea/Persian Gulf and the Western Pacific, also require access to this rich vein of MDA related information.

It is in these areas where S-AIS is already helping to turn the tide and enable maritime security forces to focus upon organized criminals, terrorists, and ever-present strategic threats. The addition of real-time updates creates enhanced watchfloor security as the maritime domain picture is completed quickly and accurately allowing authorities to immediately detect anomalous and suspicious behaviour or pinpoint black-listed vessels entering into territorial waters. No area poses a threat to the safety of a vessel quite like the Arctic which is home to some of the most dangerous weather conditions for modern shipping. With much of it covered in varying levels of sea ice, it is prone to poor visibility for vessel traffic. Traditional coastal-based AIS systems cannot provide the coverage and surveillance of the region that is required as more and more traffic enters the notoriously hazardous region.

With close to 70 satellites overhead, exactEarth will offer constant, overlapping coverage in the Arctic, providing a rich understanding of Arctic maritime traffic trends and immediate alerting of vessels entering the perilous regions. Now armed with real-time data, officials can closely monitor all traffic ensuring the safest routes are followed and can be immediately notified when ill-equipped vessels enter into the Arctic region.

Real-time data allows for an analysis that can reveal illegal activities on the ocean such as violating fishing laws, contaminating or destroying marine habitat and breaching into MPAs. Authorities need to be able to monitor vessel activity in and around these ecologically sensitive areas to help preserve the marine environment. With real-time data at their fingertips, authorities can identify vessels with pre-defined courses set to traverse through MPAs, enabling corrective ship routing measures to prevent unnecessary breaches. This type of precautionary approach ensures that not only are MPAs protected but also the vessels themselves.

With the addition of real-time data, authorities can expect to have even a bigger leg up in the daily execution of maritime operational activities. Considering that behavioural modeling can now be performed in real time, in depth ship analysis is significantly enhanced as authorities can instantaneously see any deviation in a vessel’s traffic pattern. Authorities can also know straightaway when a ship has turned off its AIS, signaling a boat that may be trying to hide its position. That same immediacy can be applied to catching illegal fishing in its tracks or spotting a ship breaching an environmentally sensitive zone. The real-time data provides authorities with the actionable information they need to not only identify suspect ship behaviours but enough time to act on that information.

As an important force-multiplying operational tool, S-AIS from exactEarth has already made a significant impact to government agencies that are responsible for maritime security, marine safety and environmental protection. exactEarth is at the forefront of advancing maritime intelligence at a time where an understanding of our oceans for security is at an all-time high. Maritime Intelligence will be a key strategic necessity and will require all vested parties to make a meaningful and substantial investment into technologies that will enable effective & efficient management of all facets of the Maritime Domain. Real Time Satellite AIS will be an indispensable asset for all agencies that need to monitor & develop a greater understanding of our seas to enhance security, promote sustainability, further trade relationships & crucially, advance maritime intelligence gathering capabilities.