

Maritime Merchant Connectivity Boom

Crew communications enters a new era



In association with



Introduction

Where some industries have stalled and suffered repeated setbacks, connectivity solutions for the maritime industry have boomed.

Over the last two years, merchant container companies have built up significant reserves of cash in the bank. This is in stark contrast to what was on the horizon at the start of 2020.

The majority of the countries around the world went into lockdowns and restricted the movement of people. As global economies came to a halt, the need for goods reduced and this was reflected in the first six months of that year. Many merchant shipping companies limited the scope of their vessels' global operations.

Furthermore, the international cruise market came to standstill, energy prices plummeted, and thus the incentives to extract oil and natural gas from offshore sites also diminished greatly for energy producers.

It is estimated that this initial period resulted in nearly five per cent of the world's VSAT equipped vessels going offline. Both passenger and offshore energy vessels recorded the biggest drop ever in vessel traffic and revenues spent on satellite connectivity. Overall, L-band and VSAT retail airtime revenues dropped by more than 11 per cent in 2020 from 2019.

However, by the end of 2020, a different trend started to emerge. There were huge backlogs in goods needing to be transferred with many economies re-awoken by government subsidies. This was compounded by a shortage in ships to transfer those goods and commodities. Ship freight and container rates skyrocketed. In addition, the energy market rebounded and offshore production and exploration came back into vogue.

Fast forward 12 months to the end of 2021, and more than 39,700 vessels, up from 28,350 vessels in 2020, worldwide were VSAT-equipped.

The associated airtime revenues for those vessels were estimated at US\$1,263 million. Combined with L-band service revenues, the airtime connectivity market amounted to \$1,685 million in 2021, a big jump of 42 per cent from 2020.

Vessels with high-speed and voice L-band services totaled more than 47,300 worldwide and nearly 80,000 vessels on low-speed/no voice services were active in 2021. The aggregated total of these service fees reached \$432 million in 2021.

Player Ecosystem

The resurrection of the retail satellite maritime marketplace has been fascinating. Companies with strong presences in the energy or passenger cruise portions of the market suffered greatly in 2020, such as Global Eagle, now Anuvu, and Speedcast. Interestingly, both companies bounced back strongly in 2021.

Inmarsat and Marlink continued to perform strongly in 2020 and 2021, propelled by their strong propositions in the commercial merchant market.

Inmarsat continues to build up its FX installed base with its direct to market entity and through its value-added reseller network. Combining both, the satellite operator added more than 1,100 commercial maritime vessels in 2020 and nearly 1,700 in 2021. In addition, the average monthly data consumption of its vessels increased by a factor of three.

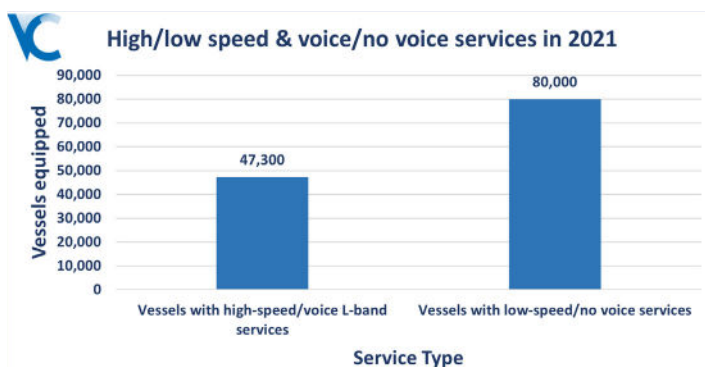
Marlink performed strongly in 2020 and 2021. The Marlink group purchased the offshore energy company ITC Global in 2020. The company further augmented its merchant maritime business, growing its VSAT revenues in both years.

Another notable performer was Navarino. The Greek service provider made a number of shipping wins in 2021 and continues to be Inmarsat's largest value-added reseller of FX.

What each of these providers have in common is a highly developed proprietary infrastructure for maritime VSAT services, which, for their shipping industry customers, enables material improvements in the quality of life for the crew and operational effectiveness of the bridge communications.

Merchant Operators

Each of the key user groups of connectivity at sea have different requirements. In some cases, offshore energy vessels require the same uplink throughout as downlink. Big passenger cruise vessels require massive downlink capabilities. Large leisure vessels can be even higher on a data capacity per person basis. Valour Consultancy here are focusing on the merchant sector which is the bedrock of maritime connectivity use.



As of the end of 2021, more than 92,800 vessels were subscribing to MSS and VSAT services. The total revenue value of the market equated to greater than US \$1 billion. Nearly 98 per cent of commercial merchant vessels use satellite services. 30 per cent of this available market are utilising VSAT services and it is still growing strongly.

A Look at Advanced Mobility for Crew Welfare from ST Engineering iDirect

Supporting Quality of Life at Sea

For ST Engineering iDirect, the issue of crew connectivity is of paramount importance. Since the pandemic stranded crew onboard their vessels for weeks on end, this topic has been brought into even sharper focus and is today considered an essential service for any company that employs crew on board their vessels. When looking for employment, the availability of a good level of access to communications often informs the basis of their decision.


The challenge for service providers lies in the requirement to offer flexible technology that brings value to the crew without being cost prohibitive. This is achieved through effective management of bandwidth to allocate available resources to where they are needed whilst offering an excellent user experience – what we collectively refer to as ‘Advanced Mobility’ – that can cope with the demand of applications used by crew to chat with friends and family online, make and receive video calls, surf the internet and stream video, as well as the operational applications that are used daily.

Creating Truly Advanced Mobility

Advanced mobility comprises the necessary building blocks to achieve connectivity on par with terrestrial. iDirect has developed a comprehensive suite of products, technologies, and capabilities that enable service providers to offer their customers the capability to deliver a high standard of connectivity for crew whilst on board. What are the component parts of a solution set to overcome the challenges associated with delivering reliable connectivity at sea? The iDirect answer incorporates waveform innovation, modem diversity, network scale, terrestrial user experience, customized performance, and unlimited service growth. Together, these can closely approximate the relatively seamless type of mobile connectivity we have become accustomed to in our daily lives.

iDirect has pioneered waveform innovations that enable service providers to optimize their bandwidth and satisfy demands for higher throughput on each vessel. One such recent innovation is a single return technology to simplify network sizing, procurement, commissioning, troubleshooting, and logistics. Such advances continue to ensure the very highest throughput rates and network availability, and the ability to automatically adjust or optimize the satellite capacity not only onboard the vessel itself but for multiple vessels when required.

To complement waveform innovation, iDirect’s modem range covers the widest spectrum of use cases from low data rate to high data rate applications. These modems support all kinds of vessels—from a fishing boat that needs just tens of megabits per second of service, to a cruise ship that needs a gigabit or more. Service providers



and their customers can choose the right modem for their service level and applications while considering price, deployment options, and features. Our modem set today includes modems that are configurable for more than one of our VSAT platforms and/or are designed to function on our next generation platform.

Customer (and ultimately crew!) satisfaction hinges on delivering a land-like experience. A number of technologies are needed to accomplish this with fidelity. Modems installed on board vessels must be able to seamlessly connect and disconnect across multiple satellite spotbeams as they traverse across the sea. Beam-switching is thus essential to ensure continuous connectivity with no downtime for crew applications. iDirect's modems feature mobility technology that reduces beam switching to a couple of seconds. Additional technologies such as bandwidth pooling, Group Quality of Service, and capabilities including adjusting for crossing various national and regulatory boundaries are all additional factors for connectivity. There are several technologies that ensure that the satellite signal is not perceptibly interrupted during changes in beams, satellites, global regions, weather conditions, and many other potential sources affecting the connection.

Beyond this major task of simply staying well-connected, a service provider has to facilitate the level of service needed by a particular customer, and these can vary by extremes. One customer's top priority may fall much further down on another customer's list of requirements. Meeting service level agreements (SLAs) is critical to customer satisfaction and, therefore, customized performance is another key to truly advanced mobility. iDirect has set the standard for global management of bandwidth for the very largest service providers, extending to them Quality of Service capabilities to a level of precision unavailable from other VSAT technology partners.

To maintain performance as requirements grow is at the foundation of service providers' strategies. Service providers are supporting ever more terminals, more customers, more services, more locations and more devices on a network and the ramp up shows no signs of slowing. To achieve truly advanced mobility requires a major expansion of network scalability.

For service providers supporting many customers across regions or globally, the final element to establish truly advanced mobility is unlimited service growth. In industry today, growth abounds. Whether it is more devices for each crew member or more customers that want to provide assured crew communications in the wake of the pandemic, service providers are winning and keeping customers by enabling them with a service that doesn't impart limitations. To do so, service providers and global satellite operators are relying on the VSAT platforms from iDirect.

New! VSAT Within Reach for 12-24M Vessels

For Service Providers that serve smaller vessels, there have been significant improvements in VSAT technology which radically change the considerations when comparing VSAT to other connectivity options. Smaller antennas offer the market an easy but reliable way to provide operational and crew or passenger connectivity. This new generation of sub-60cm antennas brings high-quality broadband performance in a smaller, lighter package. The antennas can typically be carried onboard by crew, and with simplified connectivity innovations, can even be installed without the need for additional technical support. Networks utilize a combination of conventional wide beams and high throughput satellite (HTS) spot beams to deliver a consistent level of broadband connectivity worldwide. These more performance beams and high-power capacity allow for smaller antenna sizes to be as effective as larger ones. These antennas cost significantly less than anything previously available for similar performance. When combined with iDirect's waveforms to access every last drop of

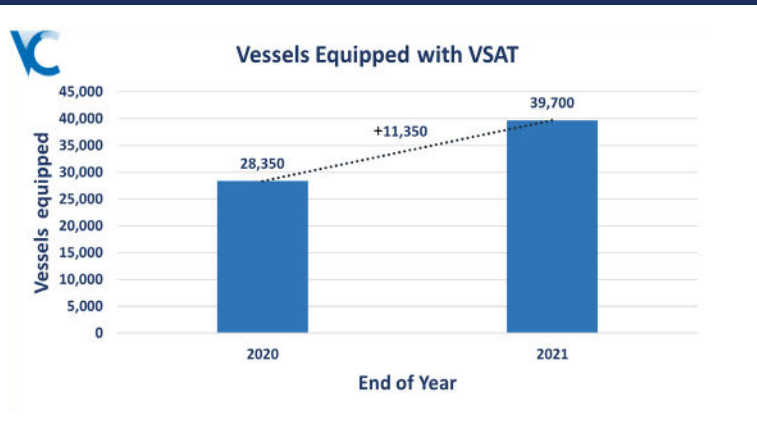
performance out of the antenna hardware, this means a fast and higher ROI for vessel owners or fleet managers.

Experience Matters

Service Providers can take iDirect's decades of experience and develop new and more certain revenue streams by offering their customers true broadband connectivity. Our mobility solutions deliver the high performance, efficiency, and bandwidth management that customers demand. Today, more than half of all VSAT remotes deployed on maritime vessels are manufactured by iDirect, and nine of the ten largest maritime VSAT Service Providers rely on our platform to run their networks.



Valour Consultancy projects more than 50 per cent of the global merchant vessels will be utilising VSAT services within the next six years. Many people in the industry have concluded the growing demand for VSAT and better services needs is down to the digitization of vessels and a greater array of applications deployed by shipping operators. To some extent this is true. However, the biggest consumer of VSAT services is the crew.



Inmarsat reported data consumption of its vessels increasing by a factor of three between 2020 and 2021. As the majority of the company's maritime business is merchant, it is easy to correlate this with increased usage of merchant crew users. This trend is emphasized with the recent updates to the Maritime Labour Convention 2006 (MLC*), which covers Internet access for crew on merchant vessels.

During the Covid period, some crew staff were stranded at sea for months. Some spent longer than a year away from home. These lengthy periods of isolation played havoc with crews' well-being. Many decided on a change of career once country restrictions lifted and crew returned home.

This has resulted in a shortage of crew for maritime operators, particularly officers. As such, one way to entice new crew is to offer very good amenity services, such as unlimited Internet access. A growing number of the larger merchant companies are incorporating this policy.

However, it is worth noting that some seafarers have much less access to connectivity for welfare and sometimes none at all. Often these crew are operating in the developing world or beyond the reach of regular inspections.

Expectations of Connectivity

According to the International Chamber of Shipping, the worldwide population of seafarers serving on internationally trading merchant ships is estimated at 1,647,500. Of this total, 774,000 are officers and 873,500 are ratings (general term for seafarers who undertake the physical tasks essential to the safe operation and maintenance of the ship).

* The MLC is an international treaty designed to protect seafarers' rights and has been ratified by more than 100 countries, who represent over 90% of the world fleet

The leading five nations for supplying seafarers are China, the Philippines, Indonesia, the Russian Federation and Ukraine.

Countries	Internet Broadband (Mbps)	Mobile Cellular (Mbps)
China	19.6	165.4
The Philippines	71.9	35.0
Indonesia	27.8	23.1
Russian Federation	96.0	29.0
Ukraine	76.8	32.0
United States of America	203.8	110.1
United Kingdom	102.2	86.6

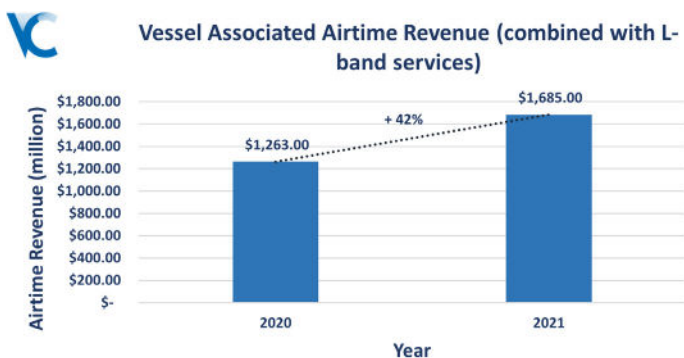
Figure 1: Listed above are these countries' typical broadband speeds and mobile cellular connectivity speeds on land with the US and the UK as comparative examples. Of the top seafarer nations, China had the fastest Internet broadband and mobile cellular speeds on land compared to the other seafarer nations, on par with the US, and faster than expected in the UK and most countries in Europe.

In regards to ratings, the Philippines is the biggest source of seafarers. This is followed by China, Indonesia, the Russian Federation and Ukraine. Interestingly, China is the biggest supplier of sea officers, followed by the Philippines, India, Indonesia and the Russian Federation. To provide readers with the levels of expectations for connectivity on land by each of the nation of seafarers, Valour Consultancy collated a short table of the average speeds.

Indonesia had the lowest speeds on average, which is not surprising as it's an archipelago of over 17,000 islands, then the Philippines which has over 7,000 islands. Both Russia and Ukraine also had comparable Internet broadband speeds with the UK and other countries in Europe, but lacked typical mobile cellular speeds of its neighbours.

The expectation of faster connectivity is not the only factor affecting crew usage. The deluge of new types of personal electronic devices is another. A typical seafarer may bring aboard their smartphone, a tablet, and even a laptop. However, over the last decade we have new personal electronic devices (PEDS) such as smart watches, fitness trackers, smart ear-buds, rings, and smart glasses.

All these new devices connecting to the vessel's Wi-Fi network place an additional burden upon the vessel and its supporting network. Furthermore, with a new generation of younger seafarers coming aboard, the likelihood is we will see more devices connected to the ship's connectivity network.



With enforcement of lockdowns on the majority of countries around the world, video conferencing swiftly became a mainstream technology and a major alternative to established voice telephony. This has dramatically changed the dynamic of downlink and uplink on connectivity pipes, and also increased the need for more bandwidth and reliability of connection.

Finale - The Opportunity and Solution

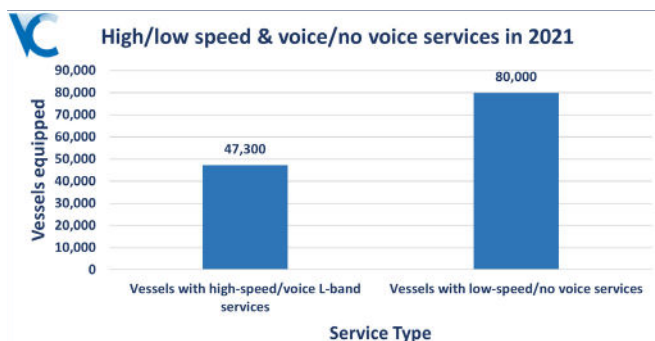
With the present boom in some segments of the merchant market, some companies have built deep depositories of money. This makes it an ideal period for companies to invest in their digital strategies, trial new tools, and invest and build their workforce.

By advancing their vessel digital operations, they will need to ensure that an advanced level of services is sustained; levels of bandwidth, capacity and reliability must also evolve accordingly. However, maritime companies also need seafarers to manage these operations. Finding, keeping, and managing these seafarers involves offering an array of critical benefits.

Aside from seafarers' earnings, VSAT broadband connectivity is a must to ensure vessels' crew, well away from the coastline, get the necessary bandwidth to stay in contact with their family and friends. And as mental health is becoming more commonly discussed in the world today, providing crew with connectivity access is a critical element to helping maintain morale and ensuring good mental health. This is something the International Seafarers' Welfare and Assistance Network (ISWAN) is promoting for seafarers around the world.

With an extensive range of high throughput satellites and innovative ground systems in place, service providers aim to take advantage of these offerings to ensure their customers can achieve better performance results. To maximize investment in the cost of capacity, service providers rely on a range of technology for advanced mobility: this includes automatic beam switching so vessels can automatically connect to satellite beams as they traverse through different coverage areas around the world. As we've seen from expectations of online performance (see Figure 1), the bulk of seafarer nations are already equipped with very fast levels of connectivity.

This goes beyond simply providing a platform for VSAT connectivity for maritime users to understanding the expanding range of applications, how they interact with systems, crew or passengers on board and optimizing the necessary bandwidth to get the best results and experience from these new applications.



Furthermore, this will involve service providers being able to implement reliable bandwidth management tools that can configure, manage and control different onboard traffic on the VSAT connectivity solution. The growing use of SD-WAN solutions will move service providers to prioritize service levels based on customers' criteria and profiles for key services and applications.

About Our Whitepaper Sponsor:

ST Engineering iDirect is the leading provider of maritime VSAT network platforms and modem technologies in the maritime sector and serves the majority of top maritime VSAT service providers in the industry today. ST Engineering's Dialog, Evolution and Velocity network platforms deliver high bandwidth efficiencies incorporating waveform technologies such as DVB-S2X and MX-DMA MRC. Learn more at idirect.net

About Valour Consultancy:

This whitepaper was published by Valour Consultancy, a UK-based provider of market intelligence services. Founded in 2012, the company is renowned for its comprehensive and high-quality research and consultancy across aviation, maritime and mobility markets. Learn more at www.valourconsultancy.com

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