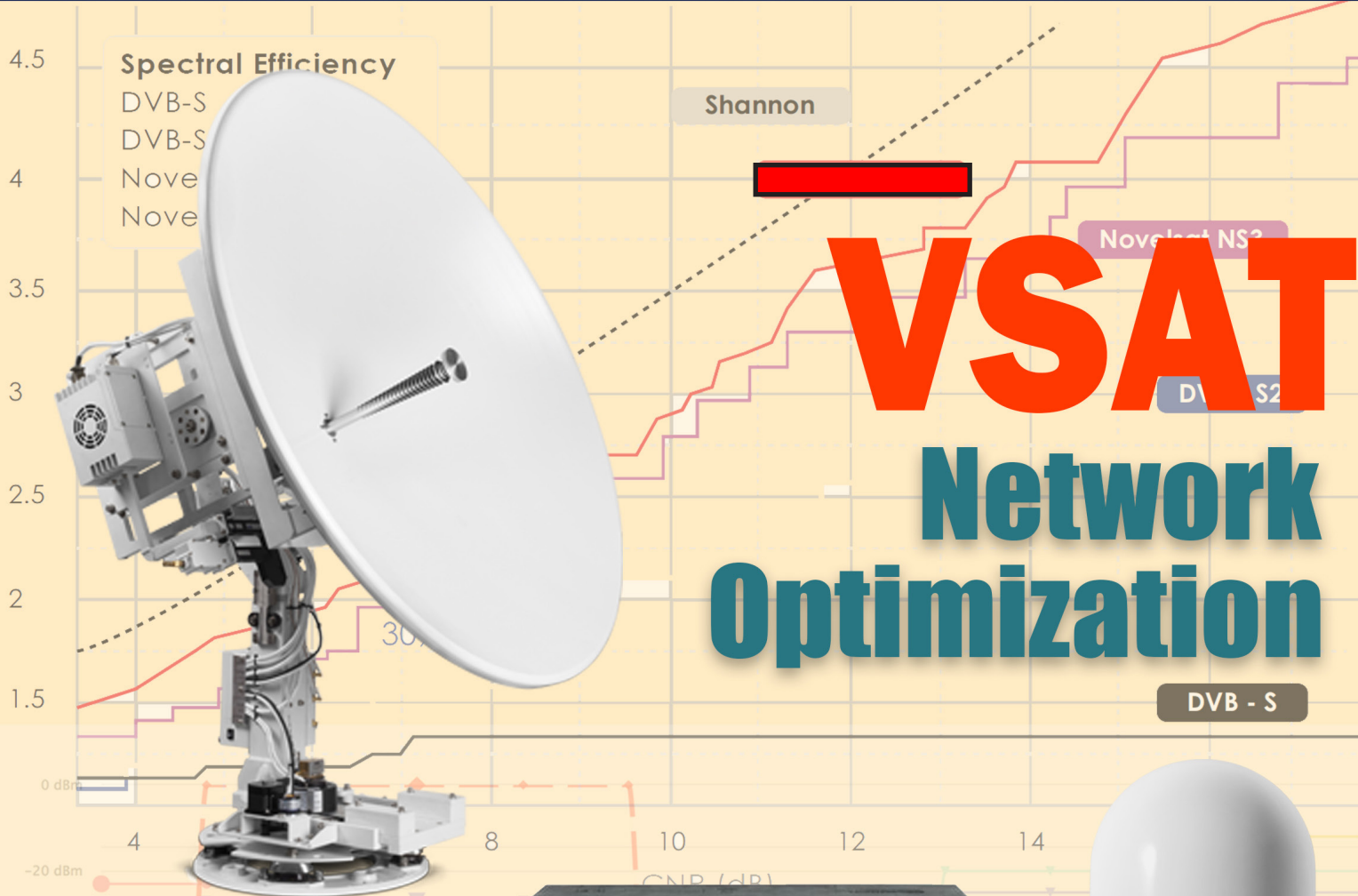


# MARKET Briefs



Executive Summaries of Market Trends and Opportunities in Key Market Segments and Regions Worldwide



# VSAT Network Optimization



# VSAT Network Optimization

by Virgil Labrador, Editor-in-Chief  
and Peter Galace, Associate Editor

## VSAT Market Overview

The global VSAT satellite communication system market is projected to reach US\$7.55 billion by 2025, expanding at a compounded annual growth rate (CAGR) of 4.4%, according to a new Reportbuyer.com market intelligence report. The ever-increasing freight trade, which has grown on account of increasing volume of goods being exported and imported, and the emergence of China and India as global manufacturing hubs, have resulted in establishment of new trade routes from Asia Pacific to other parts of the world. These developments are stimulating higher usage for VSATs on moving ships and on greater number of planes, owing to the proliferation of budget airlines.

The maritime sector has become one of VSAT's most vibrant market. Today, ships and their crew stay connected with VSATs, which provide high-speed Internet access and phone service, monitoring weather patterns to cut fuel costs, filing regulatory documents and ordering supplies from sea to save time in port and generating business intelligence through a growing range of software applications. Other major customers in the VSAT market include government agencies and commercial markets such as oil and gas companies.

A recent report by Technavio on Global Maritime VSAT Market says maritime VSAT revenues are set to grow by more than 13.7% to 2021. Technavio's analysts forecast the global market will grow at a compounded

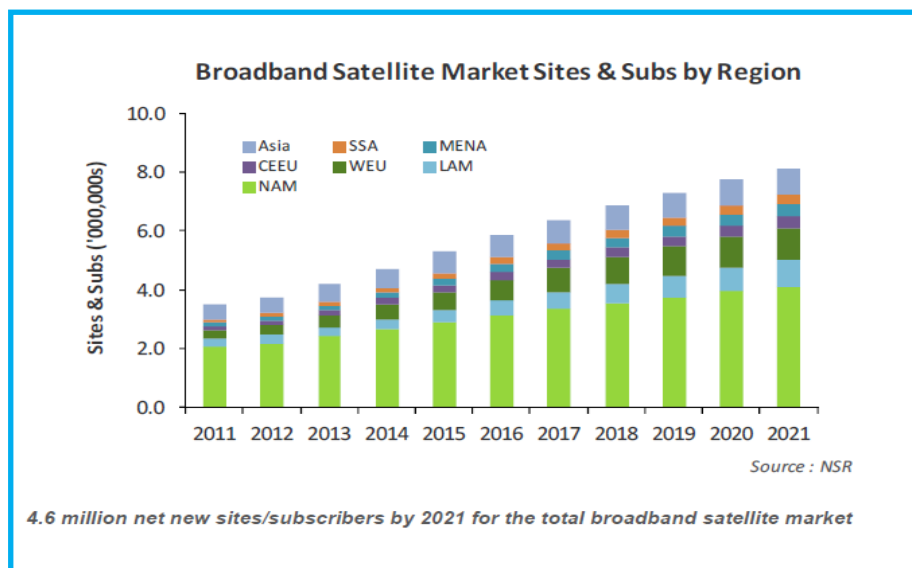
annual growth rate of 13.74% during that period.

These VSAT market assessments are shared by a NSR Report, released in January 2019, which concluded that enterprise VSAT alone will contribute US\$12.3 billion in capacity revenues by 2027, driven by key verticals worldwide. NSR forecasts that VSAT and broadband satellite markets will have cumulative revenues of US\$ 159 billion in the next decade, with 13.4% annual growth in the installed base of consumer sites alone.

"Satellite Consumer Broadband is just scratching the surface of the opportunity, capturing less than 1% of the potential addressable market," states Lluc Palerm, NSR senior analyst. "The VSAT ecosystem is still underdeveloped in many regions. A stronger focus on retail, and newly available capacity, will see accelerated

growth. Furthermore, new business models like Wi-Fi Hotspots are proliferating, which would open the lowest segments of the market. Smallcells will drive 43% of Service Revenues by 2027."

The growth of the VSAT market is getting more evident in several emerging economies, particularly in Asia Pacific and Latin America, that are undertaking initiatives to digitalize their economies to compete with their developed competitors. An example is Mexico Conectado, an initiative undertaken by the government of Mexico, that aims to digitalize the country by providing free internet in public spaces such as hospitals, schools, parks, squares and universities. Pegaso Banda Ancha (PBA), a satellite company, has deployed over 22,000 VSATs since 2004 in collaboration with Mexico's Ministry of Commu-



# Providing Custom Solutions for a Satellite Operator

Integrasys has provided satellite operator Belintersat with its Controlsat Carrier Monitoring System to deliver high quality and interference-free service.

With Integrasys' Controlsat Carrier Monitoring System, Belintersat is able to monitor up to 200 carriers per second. Additionally, the service offers unmanned operation 24/7 with interference detection, automatic SLAs compliance and reports and data analysis. All of which are crucial to maintaining a high-quality service. Upon detection of service degradation or interference, Controlsat alerts operators, meaning any issues can be resolved immediately. Reliable QoS analysis and plots ensure the upmost QoS and SLAs compliance.

For this implementation, Controlsat has been customized to address Belintersat's unique requirements. This included enhancements to the solution's data collection and reporting functionality as well as integration with a spectrum analyzer updates which allowed to achieve unmatched performances and measurement speeds of up to 200 carriers per second.

Alvaro Sanchez, General Manager, Integrasys, said that Belintersat is a forward-thinking operator with a focus on enhancing the quality of experience for its customers and differentiating itself from the competition. For Integrasys, this was important to also be integrated with a high-quality spectrum analyzer. Having worked in the specifications of Belintersat, the company knew how to support the fast rate of measurement and high accuracy the firm's customers demand.

Alexander Armonik, Head of Ground Applications Service Center, Belintersat, added that the company's operations have been growing over recent years.

That growth, coupled with international expansion, means it is more important than ever to be able to effec-

nication and Transport. In 2015, Pegaso, in partnership with Hughes, deployed the installation and services of another 5,000 VSATs.

The government of India has recently embarked on a Digital India Program to transform the country into a digitally empowered economy with focus on manufacturing, banking, education, and security. Although the country has access to submarine cables for international bandwidth,

it has also initiated the use of satellite-based communication.

Estimates of VSAT deployment in retail had been valued at US\$1.26 billion as early as in 2016. Evolution of the method of payment from cash to credit/debit cards has also resulted in the increasing number of Point of Sale (POS) terminals, which in turn has added to the growth of VSAT in retail industry.



## Integrasys' Controlsat Carrier Monitoring System.

tively monitor and control the entire network. Controlsat gives us peace of mind and the assurance that we can provide a continuous and good quality service to all of our customers.

Controlsat CMS has supposed a significant Return On Investment from the very first day, saving operational expenses, by reducing the time on the engineers required for the job. This is because of the ease of use with wide beams and HTS cost-effective solution for monitoring gateway and user beams with a scalable system allowing Belintersat operators to share simultaneously one system capabilities anytime and anywhere.

Belintersat demonstrated a growth potential with Integrasys partnership. Belintersat has recently won the Award of the Satellite Operator of the Year at Integrasys 2019 VIP Partner Summit given to Alexander Armonik.

## Trends and Opportunities

Maritime digitalization trends and increasing requests for onboard social media are accelerating demand for VSAT on planes and vessels, according to Euroconsult. Video is, by a significant margin, the primary driver of data traffic.

The onset of Low Earth orbit (LEO) and Medium Earth Orbit (MEO) broadband satellites, which



provide low-latency networks, and the ongoing development of fifth generation (5G) global mobile phone networks, are keeping VSAT manufacturers on their toes. Seen to significantly provide more bandwidth, these new technologies are seen as conduits for new IoT at sea and on air.

“One of the trends that we are witnessing in this new environment is combining different transport options to meet the application demands of the end customer. Also known as heterogeneous networks (HetNet), service providers are offering an intelligent blend of GEO, MEO, microwave, or LTE wireless connectivity combinations all managed under a single service level agreement. XipLink’s Link Balancing and Bonding solution intelligently orchestrates these connections and has been well received in this environment,” said Bruce Bednarski, Senior Vice-President for Business Development of Xiplink.

“Other examples where Link Balancing and Bonding is being deployed includes backup and augmentation of primary transport links, aggregation of multiple links into ever higher bandwidth pools, combining available capacity from different satellites to meet the end customers capacity requirements, or managing traffic flow over a combined Ka and C band network during rain fade disruptions,” added Bednarski.

### Major Players in the VSAT Market

Dubbed the 800-pound gorilla of the VSAT market by Comsys, Hughes casts a shadow over almost every player in the market. Hughes lives and breathes the technology at all levels from chipsets to installation not least because it lays claim to have started the industry with its early work in the early to late 1980s.

Hughes was the instigator of the satellite consumer internet market more than 17 years ago and has led the way ever since. The Jupiter-1 satel-

lite and accompanying Jupiter VSAT system has significantly raised transmission rates and IP throughput on the terminal. Hughes’ latest offering, the JUPITER Aero System, now offers the fastest in-flight Internet connectivity capable of delivering over 400 Mbps and operates on both Ka and Ku-band frequencies.

The JUPITER System is seen as the most widely deployed high-throughput satellite (HTS) system in the world today, delivering high-performance mobility services across both HTS and conventional satellites. The JUPITER System supports DVB-S2X—the satellite industry’s latest air interface standard and widely recognized as the most bandwidth efficient standard developed for satellite transmissions.

Hughes also offers the dual-band JUPITER aeronautical terminal based on ARINC 791 and incorporates a highly advanced Modem Manager (MODMAN) along with an option for a dual Ka and Ku-band antenna. The terminal is fully compatible with both wide-beam and spot-beam satellites and supports rapid switching between beams and satellites, without loss of session as aircraft traverse the coverage area, thus enabling passengers to enjoy uninterrupted high-speed connectivity around the globe. It also incorporates the most advanced mobility features, including Doppler correction, adaptive coding and modulation, and enhanced beam switching, allowing seamless handoffs between beams and from satellite to satellite—all managed by a single Network Management System (NMS). The system also includes a number of advanced features to improve the passenger experience, including onboard traffic management, Quality of Service (QoS), compression and acceleration.

Seen previously as laggard in IoT, the maritime industry’s appetite for digitalization is now leading the way with almost all ships now getting equipped with digital offerings. In

January this year, Inmarsat increased its roll-out of Inmarsat’s Fleet Xpress Service when Mitsui O.S.K. Lines (MOL), one of Japan’s largest shipping companies, signed up for the deployment of Inmarsat’s global high-speed connectivity.

Inmarsat also offers inflight connectivity include GX Aviation solution with seamless, high-speed global coverage, and the European Aviation Network (EAN), which offers high-speed performance over Europe’s congested skies by combining satellite coverage with a complementary ground network. Both solutions enable passengers to seamlessly browse the internet, stream videos, check social media and more, with onboard connectivity comparable to what they receive on the ground.

Inmarsat says more than 1,400 aircraft are currently expected under signed contracts for GX Aviation and EAN, with a new business pipeline of approximately 3,000 aircraft worldwide. Airline customers include Lufthansa, Qatar Airways, Air New Zealand, British Airways, AirAsia, Singapore Airlines, Norwegian, Avianca, Austrian Airlines and Eurowings.

In the third quarter of last year, KVH Industries reported that it has shipped 8,000 mini-VSAT Broadband system. It said its TracPhone V-series satellite communications antenna systems utilize advanced satellite technology, including the latest high throughput satellites (HTS), to meet the growing demand for more onboard broadband connectivity.

Martin Kits van Heyningen, KVH CEO says “their global coverage, rugged antenna systems, and innovative subscription-based business model are exactly what the maritime industry needs as it continues to move toward digitalization.”

To make the internet accessible to more people in rural areas around the world, Viasat and Facebook are collaborating in the deployment of

## Alvaro Sanchez, CEO, Integrasy S.A.

**M**adrid, Spain-based Integrasy CEO Alvaro Sanchez give an overview of their product lines for the VSAT market. Integrasy is a privately owned company specializing in engineering and manufacturing Satellite Spectrum Monitoring Systems for the telecommunication and broadcasting markets.

### Give us an overview of your product line for VSATs?

Integrasy's product line covers from the design on the network with the new Link Budget tool, and better selling capability for new sales, passing to the deployment phase of these new customers, to the compliance of the SLA with our carrier monitoring systems and predictive maintenance with Alusat system. We consider that today we have accomplished a major milestone, by providing end to end VSAT network solutions that works with the best of the best in VSAT technologies.

Today service providers who benefit from one tool in the single server architecture, they can upgrade to any of our product line solutions, anytime and anywhere.

We are extremely proud to offer a wide range of products to solve the major satellite industry challenges including:

**Selling Capacity:** today selling capacity is more complex, it has become a commodity, and even more complex is differentiating the capacity. With an easy to use link budget tool, sales reps can quote way more agile, and with a graphical report for customers out of the satellite arena to understand in one view. This enables to win new customer in new applications, where VSAT industry needs to take a step forward winning market penetration in new market segments.

**Selecting the right satellite for the right ground network:** satellites are complex, and even more so for satcom ground networks. Selecting the right network might take ages, and then the technology is obsolete. The right tools can allow you to select smart the satellite which will provide you the best performance with the minimum bandwidth, and the best ground equipment for your network in a reliable and simple manner.

**Cost of the capacity:** with better tools, for design, automate, deploy, maintain, and report SLA, a higher cost of the capacity can be justified.

**Entry knowledge required:** Satcon market it is a highly demanding for new users to start operating and serving new customers in these satcom networks, users are afraid of satellite due to its complexity therefore, simplifying it we are able to open dramatically our potential customer



base.

### What differentiates your products from your competitors?

Integrasy is a traditional company with over 29 years of experience, nevertheless, it is a highly innovative company with four industry innovation awards in the last 4 years, so customers benefit from a continuous innovation in all our products.

Integrasy products differentiate from our competitors in the ease of use, which drives in a massive Return on Investment (RoI) thanks the Operational Expenses (OPEX) savings. Additionally, our systems support 200 refreshment per second, an unprecedented speed compared to competitors are able to provide 10 to 20 refreshments.

Integrasy as a company provides full service customer care and support, with a 99% of customer satisfaction rating. In addition to our exceptional customer support, Integrasy has a business unit who is able to adapt to any customer demand as a turn key project for covering our most demanding customers with a solution that fulfil their specific requirements.

### How do you see your company's position in the industry going forward?

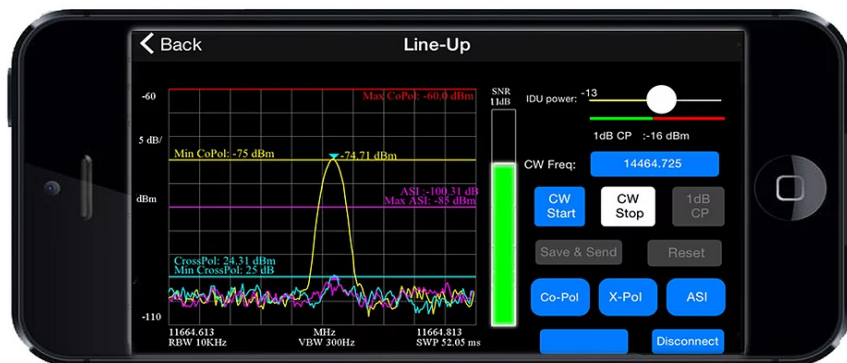
Currently Integrasy is in an expansion phase, growing every week. We are growing not just in terms of our customer base but also in the number of people where in the last year we achieved 180% increment, and also in the number of offices, with two new offices in USA and in Asia; we are also growing in revenue and more importantly doubling our profit. 🇺🇸

Viasat's satellite-enabled Community Wi-Fi hotspot service. An innovative, proven approach to bringing high-speed, affordable Wi-Fi directly to consumer's devices, the Viasat service requires minimal local infrastructure, is highly-sustainable and rapidly scalable in emerging markets where large gaps exist among demand, affordability and availability of internet services.

As part of this collaboration, Viasat will place high-speed satellite Wi-Fi hotspots—delivered as an affordable pre-paid service—at thousands of rural locations in Latin America. Facebook is investing in the roll-out and working with Viasat to help identify optimal deployment locations within Viasat's current and planned satellite coverage.

The collaboration will initially focus on Mexico, bringing internet connectivity to remote regions of the country, with an opportunity to expand globally. Dan Rabinovitsj, vice president, Facebook Connectivity, said Viasat's rapidly growing Community Wi-Fi hotspot service, already available to over one million people in rural Mexico. "This is an example of a model that can help overcome the global connectivity challenges of accessibility and affordability, particularly in hard to reach rural areas. Our joint initiative will enable more people to connect with friends and family, share knowledge and access education and career opportunities," Rabinovitsj added.

Another dominant company in the VSAT industry is iDirect, manufacturer of IP-based satellite communications products, offering technology and solutions that enable companies to optimize their networks, differentiate their services, and profitably expand their businesses. The company is also one of the largest TDMA enterprise VSAT manufacturer and is known in the mobility, military/government, and cellular backhaul sectors, having deployed more than 3,500 hubs and over 300,000 VSAT terminals all over



Integrasys Satmotion Pocket is a unique VSAT Auto Commissioning System for minimizing the deployment time, effort and interference intra-satellite such as CrossPol and inter-satellite such as Adjacent Satellite Interference (ASI).

the world.

Terry Neumann, director of business development of iDirect, said in a recent VSAT Forum that they continue to improve their VSAT technologies for wide-beam platforms, HTS technologies, and mobility technologies. He said their current focus is on providing customers with flexible infrastructure platform to allow them to maximize their investments and provide service to different vertical markets allowing them to get a quicker return of their investments. They are also creating a lot of new features to support mobility environments and mobile connectivity, which has somehow differentiated their company from the rest of the field.

### VSAT Network Optimization

The growing use of VSATs for Internet and wide area network (WAN) connections have now made it possible for companies to operate outside their offices and not restricted by long distances. But VSAT and WAN communications are not always as smooth and fast as they are expected to be. There remain challenges to overcome, such as high-latency connection, that hamper fast communications. A radio signal takes about 120 milliseconds to reach a geostationary satellite and then 120 milliseconds to reach the ground station, resulting in nearly 1/4 of a second delay. Even during perfect

conditions, satellite communications account for approximately 550 milliseconds of latency round trip time.

In addition, transmission and processing delays, such as when packets of data pass through proxy servers, or make network hops on the internet, add to the delay. Therefore, accessing company services and applications may be constrained not only by high satellite latency but by network environments, which could significantly increase the time it takes to browse, share, and transfer files.

The solutions are not always in increasing the bandwidth, as this can be very costly, and worse, may not even be a feasible solution. The solution is more about improving communications on the application and transport layers. This could be achieved by placing WAN Optimization Controller (WOC) units at both ends of the VSAT link, which intercepts packets and process them through a multi-layered protocol using proxies to accelerate and optimize the traffic.

The WOC accelerates, streamlines, and optimizes the traffic based on the following generally accepted techniques: TCP protocol optimization; Application acceleration blueprints; Content aware network de-duplication; and Traffic shaping.

By combining the acceleration benefits of TCP and protocol optimization, application blueprints, content-aware de-duplication and



traffic shaping, WAN optimization controllers can turn VSAT networks comprised of high latency/low bandwidth connections into networks that are LAN-like in nature. The WAN solution improves the performance of business applications by a factor of 5 to 60 times across satellite connections, boosting business efficiency and upgrading satellite line usability.

## Optimization Tools

The market has a slew of products aimed at optimizing VSAT networks. One of them is XipLink, which incorporates scalable WAN optimization solution in this market resulting in higher accelerated session counts and overall bandwidth and higher overall bandwidth throughput.

Xiplink allows the user a choice of several congestion control algorithms that maximize any type of wireless link. It also has tightly integrated QoS Shaping and TCP acceleration delivers amazing control. It also features byte caching, learning packet compression, streaming compression and its multi-layer compression addresses different protocols at different layers.

“We are forced to take a broader view as maintaining connectivity and delivering quality of service over a stressed wireless transport such as satellite is infinitely more difficult than over traditional terrestrial connectivity. We call our offering Wireless Link Optimization. XipLink’s Wireless Link Optimization tightly couples standardized SCPS-TP acceleration with optimization features such as several compression schemes and caching offerings. Together, they are designed to effectively fill and then exceed the available satellite capacity with customer traffic,” said Xiplink’s Bednarski.

Another company providing innovative solution is Madrid, Spain-based Integrasys. “We have innovative solutions for network planning, with 3D technologies, executive summaries and footprint loading a part of full du-

plex link budget (forward and return in a single calculation) and many innovative possibilities throughout the Beam Budget tool. We also have an innovative tool for network deployment called Satmotion Pocket, which enables to automate the deployment of any fix, maritime or aero terminal with few minutes where we are innovating more and more. Additionally an innovative network maintenance has been adopted by many of our partners for automating a re-validation of any remote site from the hub with Alusat. The last but not the least, Controlsat has been extremely useful for service providers to get an automated and intuitive Service Level Agreement (SLA) reports that shows the end user, provider, and sat operator the service,” said Alvaro Sanchez, CEO of Integrasys.


## Customer Demand

With the expected growth in the VSAT market in the next few years, customers are demanding more from their VSAT networks. VSAT operators are looking to gain competitive advantage by reducing costs, increasing network performance and improving the end-user experience at a low capital cost according to Xiplink’s Bednarski.

“Our customers are seeing a major change in the industry, and they ask for differentiating their capacity to sell more or even keep relevant, as well as further automation, so we are developing more and more product exactly for that, even a full automation end to end,” commented Integrasys’ Sanchez.

To ensure that they are responsive to changing customer demands Integrasys has created a new business unit whose key responsibility is to listen to all customer requirements and adapt their product customer needs or develop a solution completely tailor made for their need.

## Conclusion

The VSAT market is a dynamic and competitive sector of the industry. There are many providers to choose from. It is important to do the due diligence when it comes to claims by providers as to the reliability of their service or products. Among the key things to look for in a provider is to research their record for innovation and customer service. Choosing the right provider is essential in meeting the many challenges and complex requirements of the new satellite systems coming in the next few years. 



**Virgil Labrador** is the Editor-in-Chief of Los Angeles, California-based Satellite Markets and Research which publishes a web portal on the satellite industry [www.satellitemarkets.com](http://www.satellitemarkets.com), the monthly Satellite Executive Briefing magazine and occasional industry reports called MarketBriefs. Virgil is one of the few trade journalists who has a proven track record working in the commercial satellite industry. He worked as a senior executive for a teleport in Singapore, the Asia Broadcast Center, then-owned by the US broadcasting company CBS. He has co-authored two books on the history of satellite communications and satellite technology. He holds a Master’s in Communications Management from the University of Southern California (USC). He can be reached at: [virgil@satellitemarkets.com](mailto:virgil@satellitemarkets.com)

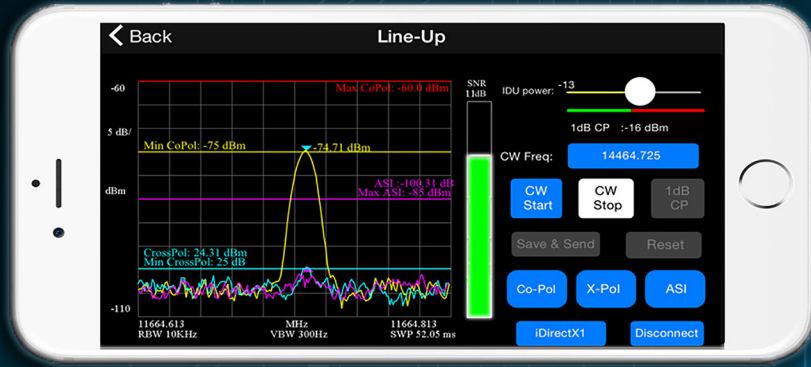
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