Gottlieb's

SATELLITE MOBILITY WORLD[sm]

Highlighting Disruptive, New Mobility-Focused Satellite Ventures and Technologies

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Gottlieb's SATELLITE MOBILITY WORLD

Welcome to the December 2024 Issue of *Satellite Mobility World* and Happy Holidays.

Starlink continues to make inroads in mobility, making significant progress in the Maritime, energy, aerospace, and rail markets. Changes in the U.S. Administration are also likely to result in new opportunities for Starlink in rural broadband and, possibly D2D. In our editorial, we note Biden's BEAD, Broadband, Equit, and Deployment Program will likely be scrapped and advocate for a voucher-based program. We also speculate on the impact of Apple's $1.7 B Globalstar investment on D2D. Here's what else we're covering this month:

- **Energy:** *Offshore: New Low-Latency and High-Capacity Satellite Solutions*, with Viasat Energy Services President Lee Ahlstrom highlighting Viasat's use of LEO and GEO and the benefits of iDirect's dynamically variable return link waveform, Mx DMA MRC.
- **Maritime:** Speedcast's EVP of Sales, James Trevelyan, describes how the integration of Starlink and VSAT, using its SIGMA gateway, has produced over 10,000 successful, multi-orbit, Starlink-GEO installations.
- **Rail:** *ScotRail Adopts Starlink-Brings Fast Internet to European Rail* covers the first UK and second-only implementation of Starlink in Europe. Michael Butler, Clarus Network's VP of Innovation and Rail discusses Starlink, its new rail antenna and the constellation's future in European rail.
- **Space Sustainability and Awareness:** *In Okapai:Orbits, AI-Based Space Traffic Management Pioneer*, CEO Kristina Nikolaus, one of Europe's brightest young entrepreneurs, explains her company's unique application of AI-based, predictive analytics to mission planning, Space traffic management, and sustainability. Enjoy!

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With Speedcast's Executive VP of Sales James Trevelyan...

Speedcast Melds Starlink and VSAT to Redefine Internet at Sea

Speedcast's fully integrated, multi-Orbit, Starlink-VSAT solution has altered maritime satellite communication in ways never imagined.

As of today, Speedcast has sold 10,000 Starlink units, and cruise passengers and crews on cargo vessels are enjoying the benefits of high-speed, multi-orbit, LEO-GEO services, streaming video, playing games, and video conferencing - all made possible by Speedcast's SIGMA Gateway platform and the company's seamless integration of VSAT and Starlink.

To learn more about its popular LEO-GEO multi-orbit solution and how it changes the maritime communication experience, we interviewed the company's Executive VP of Sales, James Trevelyan.

SMW: Speedcast recently surpassed 10,000 Starlink kits sold. How long have you been selling the service? What's the uptake of Starlink across your business, and where are you seeing the highest usage and growth?

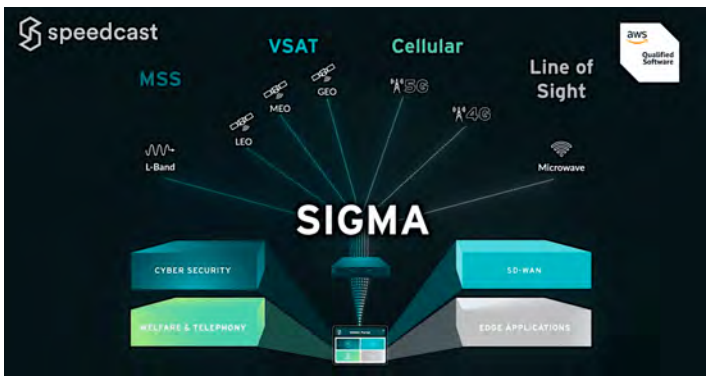
Speedcast hit the 10,000 milestone in early November, around two years after announcing our Starlink deal. We're now their largest Enterprise account and continue leading the market in sales and activations. In general, many customers in our core segments integrate Starlink as a powerful additional component to their network or for specific standalone applications at their remote sites because a typical Speedcast customer can't operate on a single-threaded network.

We've already deployed it for over a third of our customers across nearly all sectors and applications, including remote vehicle and railway connectivity for one of Brazil's largest mining, construction, and logistics operators, polar exploration and shipping vessels, and land connectivity.

SMW: Why do you think Speedcast has succeeded when other resellers have not? Besides what you've already mentioned, what other unique features and benefits does Speedcast bring to the Starlink

offering, and how are you integrating it into your multi-orbit environment?

We saw the opportunity early and embraced it. Starlink's performance has not disappointed, and it's now a key component of our toolkit. Combined with our other connectivity options, VSAT, LTE, and L-Band, it's a compelling and highly resilient solution that keeps our customers connected regardless of where they are.



For example, during last month's IS-33 satellite failure, relying on our highly resilient and scalable network, we switched most of Speedcast's customers who were using the satellite at the time to an alternate satellite beam. Customers have automatic access to secondary and tertiary satellites and beam alternatives and benefit from our integration of several closed network satellite operators that we build into network designs for customers.

Our global footprint is just one element of our success. No other provider is tax resident in sixty-plus countries, has in-house field engineers in every port, and operates at our level of technical depth. The result is an unmatched level of expertise and customer care built around our customers' needs. That's why they frequently ask us to share our practical knowledge and experience and rely on our recommendations.

SMW: Besides the NGSO-VSAT combination, has Speedcast fully integrated L-band or LTE into its SIGMA SD-WAN solution?

Yes, we've integrated it into our solution. However, it's costly per byte and requires careful network design in a software-defined environment.

SMW: Speedcast employs an SD-WAN solution vs. a bonding solution. Are there any significant differences in the customer experience between bonding and Speedcast's SD-WAN, Sigma-based solution? Can Speedcast selectively route applications over GEO or LEO depending on latency?

Bonding is often confused with load-balancing sessions. Per-packet data bonding across SD-WAN is only practical when all WAN paths have almost identical latency and packet loss. Bonding or load-balancing over vastly different connections, such as LEO and GEO, leads to an inconsistent end-user experience because sessions end up on a low latency link one minute and a high latency link on another.

Instead of bonding two dissimilar links, LEO and GEO, our software selectively 'steers' applications over the most suitable WAN, critical voice over the low-jitter GEO link where Quality of Service is available, and HTTP traffic over LEO. We seamlessly steer real-time traffic like MS Teams onto a better path if we detect temporary high packet loss.

Using our SD-WAN solution, we've successfully load-balanced traffic across multiple LEO providers with good outcomes. The latency is similar enough that overall throughput isn't impacted, and we achieve impressive speeds in the aggregate.

SMW: What features and benefits have you planned for the next iteration of your SIGMA software?

The next major release of our SIGMA edge networking software introduces greater visibility and control at remote sites.

'Under the hood,' SIGMA is transformed and supercharged to improve central

management and application orchestration. We automate the deployment of Speedcast applications and those we host for our customers and can scale them to tens of thousands of edge devices when needed.

Under SIGMA, we treat virtual machines and containerized software equally as 'apps' with identical management and lifecycle capabilities. We're also expanding the range of virtual machines that can be run on SIGMA. Multiple SD-WAN systems will allow customers broader choices. Customers can also self-manage their applications remotely through our portal.

SIGMA will help customers manage the anticipated changes that Starlink is considering implementing during 2025. For example, Starlink enterprise users will no longer be entitled to unlimited data once they exceed their priority data allowance. SIGMA will help customers control budgets and ease administration. By managing available WANs, we can balance the quality of service required for an application with the availability and cost of connections.

SMW: How are Speedcast's VSAT-NGSO solutions sold? For example, is all equipment and service included under a traditional three-year contract, or is the customer responsible for purchasing antennas and associated hardware?

We have many customers, so generalizing is tricky. Typically, our customers stay with us for many years and, in some cases, decades. Our commercial relationships evolve continually. Customers are happy to purchase low-cost, flat-panel terminals and find it advantageous to experiment with technology without making major investments or commitments to a particular technology.

SMW: How have Certus's high speeds and GMDSS's voice and complete global coverage enhanced your VSAT-NGSO offerings?

When rolled out in the next month or so, Certus GMDSS will consolidate several legacy systems into a single terminal, marking a significant evolution in maritime safety and communications. Many of our customers already use Iridium Certus and are eager to add GMDSS functionality to lower costs, simplify, and streamline into an all-in-one solution.

SMW: Starlink's connectivity directly to the public Internet raises serious security questions. What are you doing for customers using the Starlink-VSAT or OneWeb-VSAT multi-orbit offering?

We've successfully integrated thousands of Starlink terminals into customer networks and designed those networks as secure as budgets allow. Generally, Speedcast doesn't route Public IP directly to a remote site. Instead, we use NAT from our edge infrastructure to mitigate the risks. We'll also host integrated local and cloud-managed XDR and SIEM solutions.

Our SIGMA platform provides next-generation firewall (NGFW) capabilities to protect against modern cyber threats. It combines conventional firewalls with other network device filtering functions, such as an application firewall, deep packet inspection, and intrusion detection or prevention.

SMW: You've also contracted with OneWeb. How are your customers reacting to the OneWeb vs. Starlink solution? Has the availability of OneWeb enterprise-class service impacted consumer demand for a Starlink? Does Speedcast offer an SLA for the combined VSAT-Starlink combination or only for a VSAT-OneWeb?

OneWeb sales in 2024 were less than we forecast at the end of last year, mainly due to delays in completing the network rollout, the type approval of alternative flat panels, and some technical items

associated with introducing a new constellation.

While 2024 focused more on Starlink, OneWeb remains a top talking point with customers. Some have already determined that it will act as their primary WAN connection for various reasons, including the Layer 3 direct interconnect between Speedcast and OneWeb PoPs around the world. We're also in discussions with Starlink about a Speedcast L2/L3 core network interconnect.

Others are leaning toward OneWeb because, in some cases, today's digital operations simply demand a high-speed, low-latency alternative to Starlink or MEO options. Speedcast offers bespoke SLAs, and where possible, OneWeb supports our delivery of 100% uptime for customers.

SMW: Is the OneWeb service currently available globally? If not, when do you expect to be ready for commercial service?

While OneWeb is yet to become global, it has large regions where it is fully operational and servicing customers today. Coverage will continue to expand, and we're excited about the expansion as we move into 2025.

About James Trevelyan:

James joined Speedcast in 2018. He currently serves as the company's Executive Vice President, Sales and Marketing, leading the company's global commercial organization.

Prior to joining Speedcast, he spent 17 years at Arqiva in various commercial and sales leadership positions, including management board director of the company's Satellite and Media division. He has also held sales roles at Nortel Networks, Lexmark and IBM.

James serves as the current President for the Space & Satellite Professionals International (SSPI) Board of Directors, a non-profit industry association, and previously completed a second term as Chairman of the World Teleport Association, a non-profit organization serving the interests of satellite teleport operators.

James graduated with a double honours degree in International Business and Modern Languages at the University of Strathclyde, Glasgow.