With Hurtigruten Cruises Kristoffer Halvarp...

Internet on Ice

How Speedcast and Starlink are Bringing Broadband to the Poles

Cruise and expedition vessels struggle to connect to the Internet at the Poles and at high latitudes, There GEO satellites hover on the horizon and rough seas, and inclement weather degrade satellite signals, making broadband connectivity almost impossible - until now.

With the coming of Starlink, OneWeb, and the other LEOs, travelers headed to the far north will soon experience shipboard Internet at broadband speeds rivaling Internet at home. It's already happening on Hurtigruten, one of the world's best-known expedition cruise lines.

Enabled by Speedcast and relying on a combination of Starlink and Ku and C-band GEO satellites, Hurtigruten Expedition Ship passengers and crew now enjoy unlimited free e-mail, Web surfing, streaming, and even video conferencing - all at the bottom of the world.

Satellite Mobility Feb 2023

To learn more about Speedcast's innovative polar and high latitude solutions, we've interviewed Hurtigruten's - Network and Maritime Operational Technology Product Owner, Kristoffer Halvarp.

SMW: Hurtigruten sails in the most challenging regions of the world for Internet connectivity, at high latitudes, into fjords where mountains often block satellite signals, and in inclement weather. Can you describe your Internet connectivity experience before installing of Speedcast's hybrid LEO, GEO, and LTE service?

Kristoffer Halvarp: (Kristoffer): Our Expedition ships go far south to the Antarctic region and far north to the Arctic. There, GEO satellites are close to the horizon, and combined with adverse weather conditions, Internet connectivity is less than ideal.

In 2020 along with our long-time partner Speedcast, we added Starlink maritime. Since then, connectivity has substantially improved. We are now experiencing downlink speeds of 150 Mbps and 30 Mbps on the uplink at an average of 85 percent uptime in Antarctica and nearly 100 percent in Europe. However, Starlink speeds vary significantly. You will recall it's a "best efforts" service, and Starlink doesn't guarantee speeds and uptime or offer a Service Level Agreement (SLA). However, what is more important to us than speed is latency.

While a 50 Mbps downlink on GEO was sufficient, the latency of 700-800 Milliseconds was the main pain point, resulting in poor performance. For example, loading even the simplest website would take several seconds.

With Starlink, we reduced load times to a second or less, and even rain fade in Antarctica is not a significant problem. So, adding Starlink has resulted in a significantly improved customer experience, and we expect even better performance once Starlink adds more Polar-orbiting inter-linked satellites.

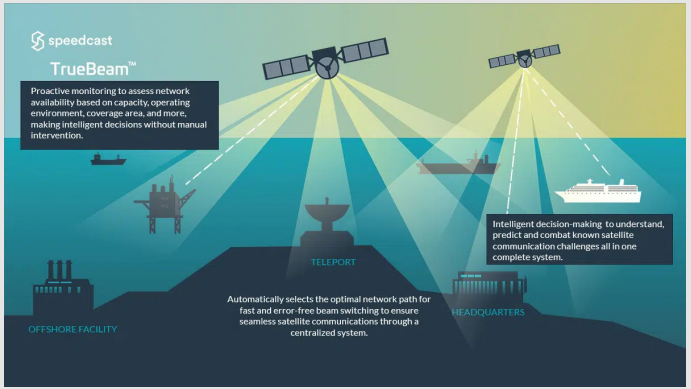
SMW: What is the network configuration?

Kristoffer: On our Expedition ships, three of

Speedcast Hurtigruten Antenna Installation

which operate in polar regions and three in Europe, we're using C and Ku-band GEO and Starlink, doing load balancing and bonding the satellite links with Talari SD-WAN and managing them with Speedcast Truebeam.

Editor's note: *[Speedcast's patented TrueBeam solution is one of the foremost tools ensuring the Hurtigruten fleet's connectivity. It delivers algorithm-based centralized capacity and load balancing across the entire Speedcast network to ensure the highest levels of performance on remote expedition cruises. TrueBeam operates without human intervention, providing proactive monitoring and automatic selection of optimal coverage for a remote site for fast and error-free beam switching. The intelligent system predicts and mitigates network challenges, allowing remote sites to seamlessly maintain communications.]*



Starlink satellites are also optically linked to remote ground stations in South America and Europe thereby maximizing polar coverage.

However, we haven't deployed Starlink on our coastal vessels and depend mostly on cellular backed up with Ku-band GEO. Near-shore cellular connectivity, and in the fjords is excellent on both 4G and 5G networks.

SMW: Why did you use Starlink in Europe instead of GEO?

Kristoffer: In certain parts of Germany, cellular coverage is poor. However, in those areas, it is better than GEO. So, there, we use Starlink. On good days, we can experience around 230 Mbps on the downlink and 30-40 Mbps on the uplink. As far as I know, we were the first cruise vessels to operate Starlink from Hamburg up to the Danish

coast. Combined with GEO along certain areas along the British and German coasts, it assures nearly one hundred percent uptime.

SMW: Can Starlink be the sole solution, or do you believe it will always be part of a multi-orbit solution?

Kristoffer: You should always have a backup solution. Without a proper SLA, it's hard for me to consider Starlink as a sole solution.

SMW: Can you describe the antenna installation on your vessels?

Kristoffer: We use the Starlink maritime package, which consists of two antennas, and we are considering adding one or two more antenna kits. Unlike the major cruise lines, which use a dozen antennas on ships that accommodate five thousand passengers. Our largest vessels accommodate 500 guests and 600 crew.

SMW: Hurtigruten began testing Starlink in March of 2022 and placed it in service at the end of October 2022. Can you tell us about your installation and testing experience?

Kristoffer: We began offering Starlink to passengers in March of 2022. The first installation of the maritime kit was done in Boston and completed in three days with the assistance of the Speedcast engineers. Hurtigruten was the first Speedcast customer to deploy Starlink across its global fleet. We began offering it in Hamburg and out to sea from Germany, although, at that time, we didn't advertise it in any way.

"You should always have a backup solution. For now, without a proper SLA, it's hard for me to consider Starlink as a sole solution."

In March, the Starlink maritime package was unavailable, and we used the RV package. Introduced in September, the maritime version featured two high-performance antennas with pole mounts, which early on proved unstable in Artic environments and needed modification. Starlink has since upgraded to a flat mount, which Speedcast is now in the process of installing.

SMW: Speedcast also has an agreement with OneWeb, and I understand they will offer CIR and an SLA. When the OneWeb service becomes available, would you consider switching?

Kristoffer: We see huge benefits from a LEO constellation due to the regions in which we operate and the performance it provides. Most antennas we install on our vessels can track LEO and GEO satellites. So, the new, multi-orbit antennas, like Intellian's new NX series, would allow us to switch to OneWeb or another LEO provider should we find a new offering more attractive.

SMW: Have you surveyed your passengers, and can you share their impressions of the Starlink-enabled Speedcast service?

While we haven't surveyed the passengers, we have observed the crews, and their response has been extremely positive. They see the Starlink installation as making a massive difference in the quality of their connectivity experience. They can make video calls with their family and friends whenever and wherever they are traveling. For both our passengers and crew, Speedcast's connectivity suite is crucial, allowing to provide home-like connectivity from the most remote regions of the world.

Kristoffer Halvarp is a Product Manager at Hurtigruten, where he leads a team focused on Network and Maritime IT. With a passion for remote communication systems and a commitment to driving technology forward, Kristoffer and his team are dedicated to pushing the envelope of what is possible. Based in Svalbard for 11 years, he brings a unique perspective to the field, combining his technical expertise with a focus on innovation. At Hurtigruten, Kristoffer is