



Can Maritime Operations and Crew Entertainment Coexist on Your Satellite Network?

2nd Edition



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A new approach to delivering Internet and content services at sea may provide the answer for commercial fleet operators

For commercial vessels worldwide, VSAT satellite communications are a vital link for ensuring safe, efficient operations. Having fast, reliable access to critical weather and navigational information, as well as secure Internet connectivity to fleet operations management, is as critical as any onboard system. Real-time access to sea condition information, fleet and port data, and remote systems support capabilities can enhance crew safety, save fuel, reduce operational expenses, and ensure compliance with an ever-expanding array of regulations.

The Entertainment Imperative

But that's just half the story. For ships operating in the open oceans, that satellite link is also a crucial connection to life on land for the crew. Internet-based communications and entertainment are part of the fabric of life on shore. Today's seafarers, especially younger "digital natives," expect that experience at sea, too. Communications with family and access to entertainment are rapidly becoming "must haves" for attracting and retaining qualified crews and maintaining morale on long voyages. Indeed, leveraging broadband communications to reduce feelings of isolation at sea is a competitive advantage for shipowners and managers.

"Good crew morale and job satisfaction are key to efficient operations and services provided for crew off watch can have a significant impact. Content provides a high return on investment and the effectiveness and power that content can have makes it one of the most efficient ways to spend your crew welfare dollar. Fleets have great content licensing options available for almost any budget and little or no onshore staff resources are needed to provide content that crews will appreciate and value. It's an easy, affordable way to stay competitive and have a happy crew."

– ["5 Questions with Candice Pascal"](#), Vice President, Content Acquisition

Leveraging broadband communications to reduce feelings of isolation at sea is a competitive advantage for shipowners and managers.



These facts of modern life are driving companies to upgrade their vessels' satellite-based broadband data capability. Unfortunately, they are rapidly discovering that satellite bandwidth – like the fuel that propels their ships – is a valuable and scarce commodity. Once Internet access is made available to the crew, they consume it voraciously: downloading movies and music, updating their social media, video chatting with family, and pursuing other bandwidth-intensive activities. In the maritime VSAT marketplace, experience has shown that crews with unlimited, unmanaged access consume 85%–95% of the available bandwidth. This leaves scant bandwidth for mission-critical activities.

The Truth About “Unlimited” VSAT Plans

Part of the problem stems from confusion about maritime VSAT pricing plans. So-called “unlimited” maritime VSAT plans, which specify a promised speed, are in fact capacity constrained. Clever marketing spin from satellite service providers has clouded the fact that satellite bandwidth has a limited capacity to carry bits of data to and from the vessel. Capacity is not speed – it is bandwidth used over time. Since bandwidth is limited and costly, it must be carefully managed if the service provider is to remain profitable.

Even under normal conditions, promised service speeds are often not realized. That’s because promised speed refers to the total bandwidth delivered to the vessel. This is divided among the number of users trying to access the network, meaning individual vessels or users do not experience anything close to these speeds. Moreover, research has shown that delivering faster Internet service without effective controls (e.g., data allocation for users and operations) often makes network congestion worse because the improved user experience encourages greater use.

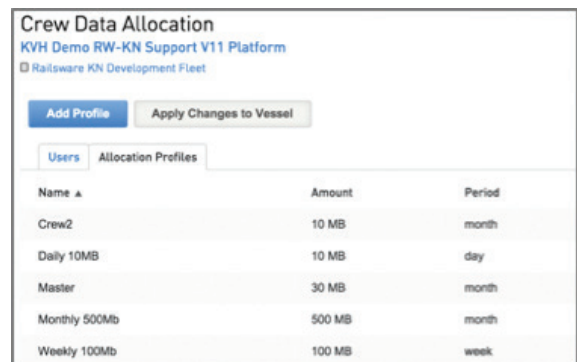
For crew personal use, this congestion can be a frustrating inconvenience – interrupting a website download, for example. But if vessel officers are unable to access broadband communications in the event of a medical emergency, major repair, or catastrophic event, the safety of the crew could be jeopardized. This is an unacceptable risk.

A Multidimensional Solution

This problem can’t be solved with point solutions. It demands a comprehensive approach that touches every step of the data flow – from teleport to satellite to ship. Meeting the competing demands for operational information, entertainment content, and Internet access at sea requires a multidimensional solution combining three key elements:

1. Internet Access with Network Management

Providing onboard hardware with built-in capabilities for managing Internet access is a critical factor in having a successful connectivity solution. It means providing tools for monitoring and managing network usage across the fleet, worldwide. These tools must allow fleet operators to allocate usage to classes of crew (e.g., captain, officers, crew) or even to individual crewmembers, with real-time alerts as predetermined usage limits are approached. This is essential to ensure priority access for mission-critical operational information, while managing the crew’s Internet usage to allow equitable access, and rein in “binge” users.

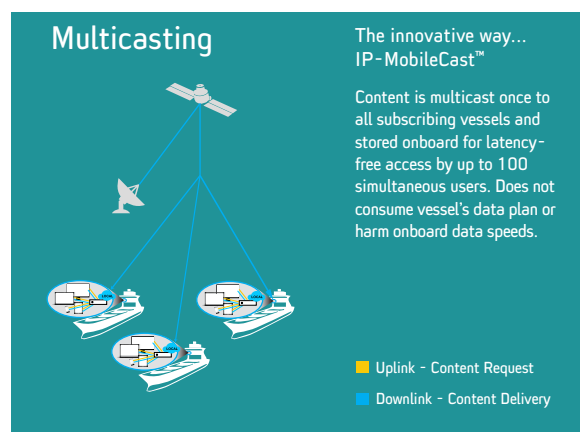
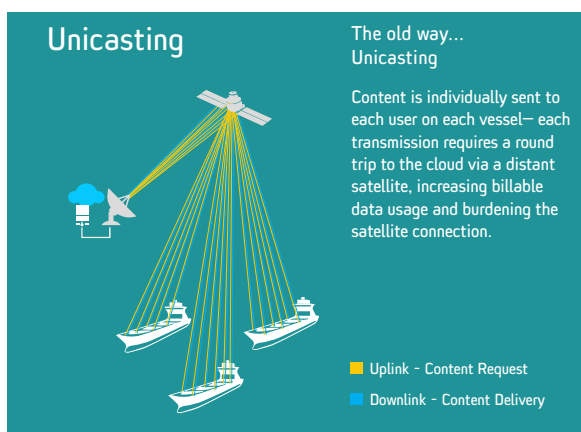


Name	Amount	Period
Crew2	10 MB	month
Daily 10MB	10 MB	day
Master	30 MB	month
Monthly 500Mb	500 MB	month
Weekly 100Mb	100 MB	week

An effective data allocation tool permits administrators to assign data use by day, week, or month based on roles or even by individual users to ensure that individual data use can’t affect the vessel’s critical operations.

2. Multicasting Large Multimedia Files & Data

In the traditional approach to satellite connectivity – called “unicasting” – all content delivery is handled individually for each user on a vessel’s network. Each transmission requires a round trip to the cloud via the satellite. Because satellite uplink and downlink capacity is limited, this creates a bottleneck that can significantly degrade service quality. The more users on the vessel’s network, the worse the bottleneck.



Fortunately, there's a better way: It's called "multicasting." Instead of delivering content directly to individual users, content is multicast once to all subscribing vessels and stored onboard. This allows latency-free access to all users on the vessel, without consuming precious satellite bandwidth. Instead of 100 users sending and receiving individual requests to view a movie, the content is delivered to the vessel's network once to be viewed by users at their leisure.

Multicasting effectively "offloads" bandwidth-intensive content, freeing up satellite capacity for real-time Internet communications – maximizing your data plan, while ensuring a quality experience for crew members.

3. Licensed Content

Having the right content is crucial to the multicasting approach. To keep crews happy, you need to provide the movies, TV programs, sports, news, and music they want. And to keep captains happy, you need to deliver the charts, weather, and training content they need. This means establishing relationships with leading content providers, negotiating licensing, and packaging content for both "on watch" and "off watch" consumption.

"Whether a ship is exhibiting a free-to-air (FTA) feed when close to shore or a movie in the crew mess, a license is needed. In almost all cases, that license is not implicitly granted. The potential consequences for vessel owners, operators, and managers of vessels exhibiting content without a license can be severe and liability may exist for these parties even in circumstances where crew violate copyright laws. Consequences can include significant monetary fines, vessel seizures, and even prison sentences."

– "[5 Questions with Candice Pascal](#), Vice President, Content Acquisition"

All of these elements are equally important and interconnected. Having just one or two of these elements is not sufficient; you need all three to achieve the goal of meeting both operational and entertainment requirements.

Comparable Cost, Greater Value

By helping overcome traditional satellite capacity bottlenecks, this multidimensional approach provides the flexibility to meet the diverse needs of a ship at sea cost effectively, while delivering greater value.

Now, instead of "one size fits all" airtime plans, pricing options can be tailored to the needs of each vessel. Fleet operators can determine their real-world needs for Internet access, without worrying about their crewmembers slowing down the data speeds for everyone onboard and

using up all of the data. And content packages allow the flexibility to select the option that's right for your crew and your budget. The result is a dramatically improved onboard experience at an affordable price.

The Power of One

Maritime operations and crew entertainment can indeed coexist, if you take the right approach. By leveraging the efficiency advantages of an innovative approach combining network management, multicasting, and licensed content, fleet operators can finally deliver the broadband capabilities their captains and crews demand without scuttling their operational budgets.

Trying to create such a system by assembling point solutions from multiple vendors would be an exercise in complexity and frustration. A defining aspect of this innovative approach is the partnership that makes it possible. Working with a single global partner who brings it all together – from global satellite connectivity and application engineering to deployment, content delivery, and ongoing support – is the key to making such a sophisticated solution an achievable and affordable reality.

As on land, demand for content and Internet access onboard ships will only continue to grow. But fleet operators who make the right technology and partnership investments today will be ideally positioned to meet the maritime broadband requirements of tomorrow.



“ A dynamic and flexible one-stop communications and media solution can provide us with a level of quality that addresses all of the factors that are so critical to shipowning and shipmanagement today. At Seaspan, we require high-quality, continuous global connectivity for optimizing operations, and cost-efficient content delivery services for attracting and maintaining the best crews possible. ”

David Kramer, Director, Fleet Management
Seaspan, Vancouver, British Columbia



About KVH Industries, Inc.

KVH Industries, Inc. (Nasdaq: KVHI), is a global leader in mobile connectivity and inertial navigation systems, innovating to enable a mobile world. KVH is the #1 market leader in maritime VSAT and designs, manufactures, and provides airtime and content services globally. KVH is a premier manufacturer of high-performance sensors and integrated inertial systems for defense and commercial applications. Founded in 1982, the company is based in Middletown, RI, with research, development, and manufacturing operations in Middletown, RI, and Tinley Park, IL, and more than a dozen offices around the globe.

Learn more: kvh.com/connections