Harris CapRock White Paper

Harris CapRock One
Cruise

by Transcendent Global Networks

HARRIS CAPROCK®

Introduction

Over the last decade the Cruise Industry has grown from 12 million passengers to over 20+ million, becoming the fastest growing segment of the Travel Industry. Cruise lines have expanded from regional lines to global business concerns, spanning different regions, time zones, and hemispheres. Telecommunication networks serve as the central nervous system for cruise lines, connecting ships and remote ports to the corporate office. The larger the cruise line, the larger and more complex their telecommunication needs.

The telecommunication network of a cruise line is unique in that it must support the communication needs of the corporation as well as the needs of their customers - the cruise line passenger.

Cruise lines are complex businesses with diversified operations, including: maritime, remote ports of call, retail, banking, gaming and hospitality. Each segment, such as operations, may include multiple sub categories, crew communications, navigation and safety. Each of the operational segments of a cruise line has unique and demanding telecommunication needs.

The communication needs and expectations passengers have changed dramatically over the last decade. With the widespread adoption of cell phones, passenger's expectations began to change. No longer were they satisfied making calls from a phone tethered to the wall. Passengers wanted the freedom to make and receive calls on cell phones, both in port and on while on the high seas.

The explosive growth of social media, combined with the development of smart handsets, ushered in new expectations regarding connectivity on a cruise ship. Cruise passengers want to log into their favorite social media platform and share their experience with friends and family back home. In just a decade, bandwidth usage per ship has escalated with future bandwidth consumption expected to increase.

Managing all of the available telecommunication technologies, carriers, licensing requirements, and costs on a global basis is a sizable endeavor. Rarely is there a one-size-fits-all solution in the technology world and so it is with telecommunications.

Telecommunication engineers must frequently seek out alternatives, adding complexity to technology and business considerations. The regional availability, or lack thereof, of specific telecommunication services exacerbates the challenge of building a global telecommunication network.

The appropriateness of a service for the appointed task is another important design decision. For instance, low latency transport options provide a better user experience for those using teleconferencing. Voice applications work best on transport mediums that offer low latency and the guaranteed delivery of packets. Crew morale options are best suited for low cost transport options.

A ship's officers and staff must have access to the same tools as their counterparts on land. The ability to send large data files, transmitting high definition video, and workforce collaboration via videoconference on an ad hoc basis requires a bandwidth-on-demand solution that is available, flexible and affordable.

Life would be simpler if decisions on telecommunication services could be made purely on technological criteria, but network engineers must factor in business criteria as well. Pricing plans are complex. Different languages and currencies add additional detail. Managing all of the available telecommunication technologies, carriers, licensing requirements, auditing, and costs on a global basis is a sizable endeavor.

Specific telecommunication services may be available in specific regions, but often aren't available globally. The telecommunications engineer must frequently seek out alternatives in different regions, adding complexity to technology and business considerations. Regional availability, or lack thereof, of services exacerbates the challenge of equipping ships that shift from one locale to another.

The responsibility for the safety and wellbeing of thousands of passengers and crew is an overwhelming responsibility. Navigation, and other ship-board systems, depend on reliable communications. Downtime is simply not an option in the Cruise Industry.

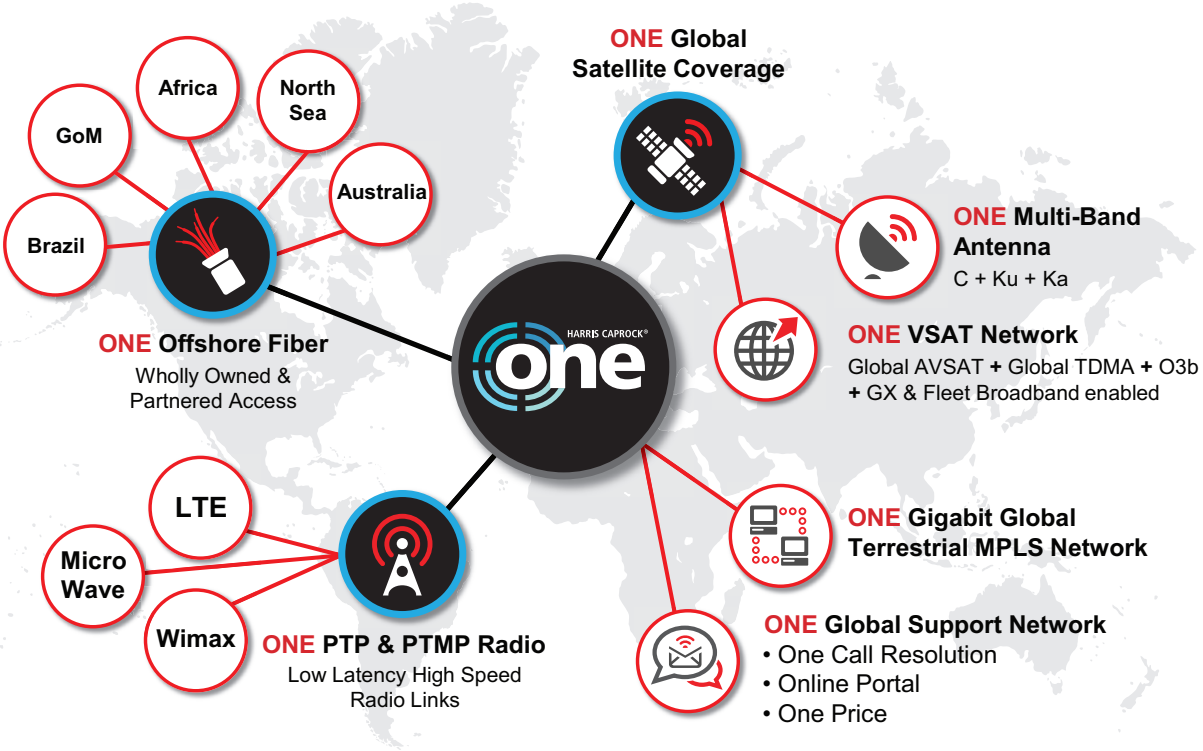
Future Proof Architecture

To meet the needs of global cruise lines companies, Harris CapRock is pleased to introduce Harris CapRock One, an intelligent service delivery architecture that insures the delivery of reliable, consistent services, anytime, everywhere.

Harris CapRock One's architecture includes all transport mediums, including satellite, wireless and terrestrial. Each of these transport mediums offer unique advantages, allowing Harris CapRock to provide the optimum solution based on customer need.

In addition to a wide range of transport technologies, Harris CapRock One incorporates a high level of network intelligence and geographic awareness. Remote locations can automatically adopt the best-fit transmission medium based on speed, latency, location and cost.

Harris CapRock has evolved from satellite service provider to a managed service provider. Regardless of technology or transport medium, Harris CapRock provides you a single point of contact for service delivery.



Global Satellite Connectivity

Delivering high quality satellite services is our heritage but Harris CapRock One should not be compared with traditional satellite services as it includes unique service elements, including: embedded network intelligence, multi-band stabilized antenna, high throughput satellites, location sensing and mapping, as well as automatic beam and band switching.

An important service element in the Harris CapRock One architecture is its proprietary multi-band stabilized antenna. Utilizing an advanced carbon fiber reflector, the antenna can support the following bands:

- C-band Linear and Circular
- Ku-band Linear
- HTS Ku-band
- Geosynchronous Ka-band
- Medium Earth Orbit (MEO) Ka-Band

HTS satellites are designed to deliver significantly larger amounts of bandwidth at lower prices than geosynchronous satellites.

As cruise ships continue to increase in size and passengers served, the demand for bandwidth continues to grow. With the advent of HTS satellites, discussions of 100 +MBPS satellite solutions to cruise ships are now within reason.

The Harris CapRock One stabilized antenna is remotely configurable, without the need for a technician to visit the ship, thereby saving both labor and transportation costs.

True multi-band operation allows the Harris CapRock One antenna to transmit and receive multiple bands. For instance, if you were transmitting on C-Band and you needed to add a Ku-Band circuit for greater throughput, this could be done.

Geographical awareness, combined with a high degree of network intelligence distributed throughout the Harris CapRock global network, including the remote antenna system, allow the network to make decisions to optimize network performance based on location and application. As a cruise ship transitions from one region to another, the antenna seamlessly transitions to another satellite. This may involve a different frequency, satellite modem, or teleport. All of this is done without human intervention. Harris CapRock One's embedded network intelligence also allows performance-based decisions to be made, routing traffic from specific applications over transport medium best suited for the task.

Universal Connectivity and Medium Roaming

A comprehensive list of telecommunication services and technologies make up another important service element of Harris CapRock One. While some might see these services as competitive to satellite technology, they are complementary, each providing unique benefits.

Telecommunication services included in the Harris CapRock One architecture include: point-to-point and point-to-multipoint radio, WiMax, terrestrial MPLS, offshore fiber optic connectivity and private and carrier-based LTE. These services can now be deployed and managed by Harris CapRock on a stand-alone basis. The company can also provide hybrid networks that leverage multiple transport technologies.

Harris CapRock One's service delivery architecture includes Universal Connectivity Medium Roaming, a powerful feature that allows application, dynamic, and active selection between satellite and all other link mediums for latency, performance, link speed, and availability criteria.

Sum of the Parts

The Harris CapRock One service delivery architecture was designed to support cruise lines that require global connectivity solutions that a scalable, reliable, flexible, and easy to administer.

Inclusive of every commercial satellite frequency, terrestrial, and wireless service, Harris CapRock One provides 99.999% network availability, no matter the transport medium. Harris CapRock One includes comprehensive geographical and mapping capabilities that support the optimization of the transport path. Quality is assured despite obstructions, range, weather, or other variables, such as congestion on public networks.

The combination of services allows for creative hybrid networks, such as the satellite and LTE. Harris CapRock One can merge these transport mediums allowing "no touch roaming" services across an entire fleet. The automatic transition from satellite to in-port wireless is another example of leveraging different transport mediums.

Harris CapRock One's advanced, multi-band satellite antenna can eliminate the need for multiple antennas and their protective radomes. This saves deck space, reduces labor and transportation costs, and eliminates costly and disruptive tear-outs and re-installation of single-purpose antennas. The antenna also allows for the integration of services from High Throughput Satellites, such as the O3b constellation, allowing the delivery of high bandwidth, low latency satellite solutions.

Automatic beam switching and medium switching minimize the need for human intervention, also reducing both labor and transportation costs. IP Routing and load balancing further enhance network performance.

The Harris CapRock One service delivery architecture includes a configurable rules engine allowing decisions to be made on different criteria, such as application priority. Important, but non-vital applications, such as crew morale, can be routed via the least costly transport medium. Mission critical applications can be given priority and transported over a different transport medium. Video conferencing and voice applications can be routed over the transport medium with the lowest latency, thereby insuring the best possible user experience.

The Harris CapRock One service footprint is global, providing connectivity in port and cruise destination. Telecommunication licensing and equipment homologation are managed on an ongoing basis to insure compliance and issue-free operations.

Cruise ships are effectively small floating cities and they communicate on the high seas via satellite. The safety and well being of 5,000 - 10,000 passengers and crew depends on reliable communications. The engineers at Harris CapRock understand that reliability is paramount and downtime is not an option.

Multinational cruise lines must navigate a myriad of accounting rules, including different currencies, tax laws, and maritime regulations. Publicly traded companies in the United States must audit their IT infrastructure as mandated Sarbanes-Oxley Rules, an involved and costly endeavor. By providing a managed service on a global basis, Harris CapRock One increase our customers cost control and dramatically simplifies accounting requirements.

Harris CapRock One was designed to make the complex easy, including commercial terms and pricing. No longer must a cruise line understand and maintain complicated pricing matrices containing hundred of variables. We can even provide services on an as needed basis. Harris CapRock One makes complicated business models a thing of the past.

Conclusion

Harris CapRock One is the industry's most intelligent communications service which monitors for and adopts the best available satellite, wireless or terrestrial network. It possesses embedded network intelligence, allowing advanced routing decisions to be made based on geographic location, application and cost. Its' future-proof architecture and industry-leading network availability is redefining 'always-on' for the cruise industry.

Our proposition is straightforward: One service provider. One contract. One price. The complex just became simple.