Ships Communicate at Dock, along Coast, and at Sea

Mariners smoothly switch between carriers for continuous communication thanks to Cisco and partner Atea.

EXECUTIVE SUMMARY

Industry: Transportation: Shipping

Location: Ships travel the North Sea, Kattegat, Skagerrak and Baltic Sea, headquarters in Southeast Sweden

Potential Users: 500 employees

BUSINESS CHALLENGES
- Provide best network connectivity for vessels and vehicles no matter where located
- Provide simultaneous connectivity among asynchronous cellular, satellite, radio, and wireless LAN carrier services
- Provide stronger traffic security to meet strict government compliance

NETWORK SOLUTION
- Cisco 1900 Series and Cisco 2900 Series ISR G2s with PfR technology
- Cisco DMVPN and Cisco IPSec security software
- Cisco Prime Infrastructure management platform

BUSINESS RESULTS
- Reliable, continuous connectivity supports essential voice and data traffic between ships and headquarters
- Traffic encryption and network intrusion protection exceed government security standards
- Monthly communication expenses slashed by 30-40 percent

Business Challenges

Reliable, stable ship-to-ship and ship-to-shore communication is vital for ensuring the safety of crews and passengers on seagoing vessels. A large European shipping company contacted Cisco® Gold Partner and IT infrastructure provider Atea with some advanced onshore and offshore communication system requirements.

The firm relies on four different communication services onboard its ships: wireless LAN over Asynchronous DSL (ADSL) when docked in harbor, 3G/4G or Long Term Evolution (LTE) cellular or code division multiple access (CDMA) radio when plying coastal waters, and very small aperture terminal (VSAT) satellite for communication at sea.

However, as Henrik Borg, senior network consultant for Atea ASA, says, "The shipping firm's existing vendor's routers could only support one carrier at a time. Once more, the router could only identify whether or not another carrier was available." As a result, communication outages of up to five minutes were a common occurrence as crewmembers scrambled to access the next best communications link. The router software also lacked needed security features to comply with increasing government regulations.

The company wanted a routing solution with a combination of capabilities that was practically unheard of in the industry:

- Smoothly connect up to four communication service carriers simultaneously: 3G/4G (LTE) cellular, VSAT satellite, CMDA radio, and wireless LAN over ADSL

- Compact, hardened equipment able to operate reliably in tight spaces under extremely harsh conditions of rough seas, sub-freezing temperatures, and corrosive saltwater

- Strong traffic encryption and network intrusion protection to comply with strict governmental security standards

Network Solution

Borg and Christopher Swenson, Atea Networking Specialist, designed an elegant solution using Performance Routing (PfR) in Cisco Integrated Service Router Generation 2 (ISR G2) routers. The firm uses PfR and DMVPN, components of the Cisco Intelligent WAN (IWAN) solution. PfR selects the best path for each application based on criteria such as reachability, delay, loss, and jitter. It also improves application availability by dynamically detecting and routing traffic around network problems and can optimize path selection based on link use or circuit pricing.

Swenson says, "We applied PfR's sophisticated triangulation and synchronization capabilities to support simultaneous carrier connectivity. If a link becomes congested, crew members can switch to using one carrier for upstream connectivity and another for downstream connectivity, which significantly improves reliability and bandwidth performance."

> "I feel we have truly made a difference implementing the Cisco ISR G2 PfR solution. The ROI was fast, the solution was inexpensive, and we exceeded the expectations of our customer."
> — Henrik Borg, Senior Network Consultant, Atea

After Borg and Swenson conducted a successful three-month proof of concept, Atea began installing Cisco 1900 Series ISR G2 routers on smaller vessels and Cisco 2900 Series ISR G2s at the docks. Plans for installing the ISR G2s in aircraft are in the works.

As shown in the figure below, each onboard Cisco ISR G2 router connects its ship or vehicle to the WAN and to a master controller that detects and enforces enterprise-wide access and security policies. The onboard router monitors bandwidth levels and automatically routes upstream and/or downstream traffic to the best carrier service when performance drops below preset levels.

Figure 1: Cisco ISRG2s with Performance Routing (PfR) software support multiple simultaneous WAN carriers, switching between them to provide the best communication performance.
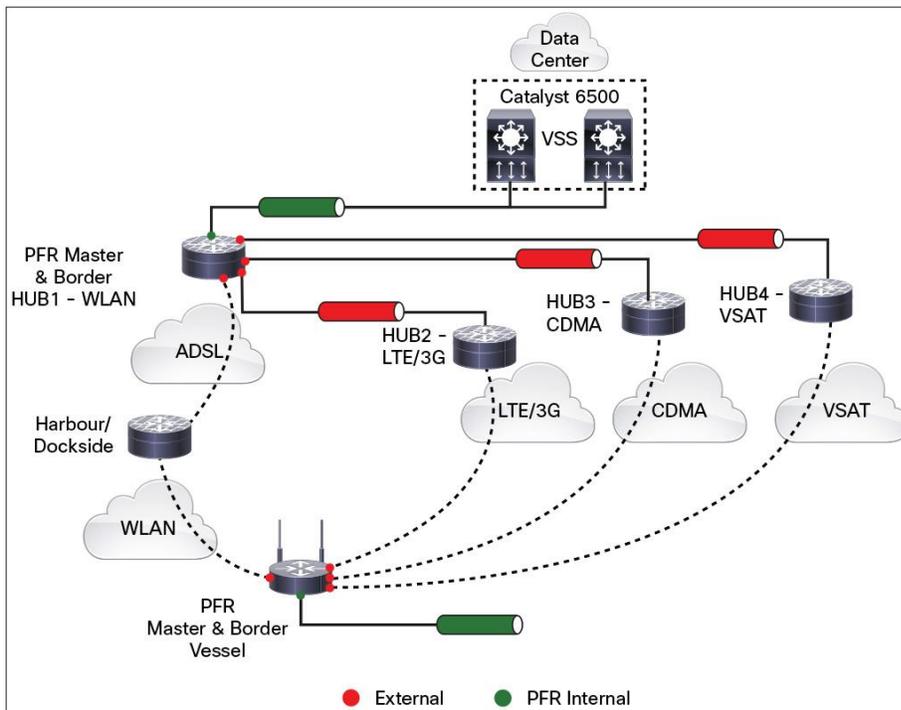
Network administration, configuration, and traffic monitoring are managed centrally at the shipping firm's data center using Cisco Prime™ Infrastructure software. The Cisco Dynamic Multipoint IPsec VPN (DMVPN) feature in Cisco IOS® encrypts data and voice traffic sent over the wireless Internet, cellular, radio, and satellite networks so vessels can communicate securely regardless of location. Cisco Intrusion Prevention Systems (IPS) software on Catalyst® 6500 switches protects the entire enterprise network from a wide range of sophisticated threats.

Business Results

The secure Cisco Intelligent WAN (IWAN) solution powered by ISR G2 delivered all the benefits that the shipping firm needed and more.

Continuous connectivity. "Communications at all times was the top priority for the customer, and they tell us that their users do not detect any interruption in service," says Swenson. He notes that bringing on a second carrier takes less than three seconds.

Security compliance. The old system failed to meet tough national security standards, but today the shipping firm has no trouble exceeding government compliance with its integrated Cisco network security solution.

Significantly lower connectivity costs. An unplanned but welcome benefit is the 30 to 40 percent savings in communication expenses that the shipping company has seen thanks to PfR's ability to determine and switch to the lowest price available circuit.

Says Borg, "I feel we have truly made a difference implementing the Cisco ISR G2 PfR solution. The ROI was fast, the solution was inexpensive, and we exceeded the expectations of our customer."

PRODUCT LIST

- Cisco ISR G2 1900 Series and 2900 Series routers with PfR software
- Cisco ISR DMVPN security software
- Cisco Prime Infrastructure management software
- Cisco Catalyst 6500 switches

For More Information

- For more information on Cisco IWAN solutions, visit http://www.cisco.com/go/iwan

- For more information on Cisco ISR G2s, visit http://www.cisco.com/go/isrg2

- For more about the Cisco PfR, visit http://www.cisco.com/go/pfr

- For more information on DMVPN, visit http://www.cisco.com/go/dmvpn

- For more information on Atea products and services, visit http://www.atea.com/en

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