

United States Coast Guard Keeps the Port of Miami Secure with Motorola's Point-to-Point Wireless Solutions

Miami, Florida



Miami harbor

Customer

The United States Coast Guard (USCG) is a military, multi-mission, maritime service and one of the nation's five Armed Services. Its mission is to protect the public, the environment, and U.S. economic interests – in the nation's ports and waterways, along the coast, on international waters, or in any maritime region as required to support national security. To increase maritime domain awareness (MDA) among the watchstanders in command centres in Miami, the USCG embarked on an initiative called Project Hawkeye, which can monitor the waters 32 km (20 miles) from the coast. The Hawkeye system consists of long-range optical cameras, RADAR, Geographic Information System, a vessel identification system and a web portal for sharing information with port partners. Hawkeye gives the Coast Guard the ability via a system of sensors and cameras to identify and track vessels in harbor and coastal waters. Hawkeye's sensors and long-range cameras with infrared capabilities act as eyes on the coast to prevent any land threats by sea in support of the U.S. Department of Homeland Security.

Solution Provider

General Dynamics, headquartered in Falls Church, Virginia, is a market leader in mission-critical information systems and technologies; land and expeditionary combat systems, armaments and munitions; shipbuilding and marine systems; and business aviation. General Dynamics is a Motorola Point-to-Point Solutions Provider and was responsible for the maintenance and installation during the USCG deployment.

The Situation and Challenge

The USCG needed to interconnect Hawkeye's various sensors, cameras, RADAR and other surveillance equipment that are strategically distributed across Miami's busy seaport. Traditionally, the Coast Guard would look to establish private circuits via T1 lines, but when evaluated, this option was too costly over time. In addition, Hawkeye could not experience any downtime or the entire network could be compromised and leave the seaport vulnerable. As a result, the links, which included some over-water paths, had to be extremely reliable in highly-congested areas, and during the unpredictable weather that often strikes Florida's coast. Furthermore, some links required that the radios operate in a coastal, marine environment. Because Hawkeye was responsible for protecting the Miami harbor and port from land threats via the sea, security was also of utmost importance to USCG.

Technical Requirements

- Data rates of at least 10 Mbps each way
- Latency of no more than 12ms
- Stability in obstructed, high interference and over-water paths
- Durability in seaport conditions, including sustainability in salt water
- 128-bit FIPS 197 compliant AES encryption
- Small physical footprint

“We were in need of a solution that could provide us with high-bandwidth without compromising reliability. For Hawkeye to be successful, our system needed to maintain Maritime Domain Awareness at all times via real-time live data. We are now able to maintain a watchful eye on the Port of Miami because of the reliability and security that Motorola’s PTP 400 gives us, even in extremely high-interference paths.”

~ Lieutenant Rhett Rothberg, United States Coast Guard

Deployment Detail and Interoperability

The USCG deployed the Motorola PTP 400 Series Point-to-Point Wireless Ethernet Bridges over 37 km (23 miles) of South Florida coastline. Each of the bridges was equipped with an optional 128-bit FIPS 197 AES encryption to meet the security requirements of the USCG and to be in compliance with FCC regulations. The deployment was done in and around a busy seaport that traditionally experiences an extremely high amount of interference. To minimise signal fading in these highly-congested areas that contained path obstructions or atmospheric disturbances, Motorola’s unique Multiple-Input Multiple-Output (MIMO) technology was employed to garner high-system gain and sustain a reliable connection. For long-range paths, the longest being 21 km (13 miles), the Motorola PTP 400 used the spatial diversity capabilities inherent in its antennae to combat multi-path fading.

The USCG also needed to maintain data rates of at least 10 Mbps each way, and, as space was a premium, several radios had to be housed in the same location. As a result, Motorola deployed its integrated radio, which contains built-in antennae throughout the Hawkeye network to deliver the bandwidth needed in a small footprint. The Motorola PTP 400’s GUI interface also made installation and trouble-shooting an easy task.

The Results

The Motorola PTP 400 Series radios now interconnect Hawkeye’s entire network comprised of sensors, cameras, RADAR and vessel identification equipment to the USCG central command centre as well as other ancillary port watch locations. The Motorola PTP 400 provides maximum capacity (35-43 Mbps depending on the path) via a unique configuration using integrated antennae in many instances. This is a result of the product’s narrow spectral footprint (needs only 12Mhz) and the internal capabilities, such as spectrum management, to design and execute channel planning. In addition to higher bandwidth, the Motorola PTP 400 ensures Maritime Domain Awareness is maintained at all times through reliable connections that are not compromised by high-interference or severe weather conditions. Another primary concern of the USCG was adhering to security standards from the Department of Homeland Security and this requirement was met through 128-bit FIPS 197 AES encryption. Furthermore, Motorola understood that downtime could make the system vulnerable and leave the door open for a land attack on this busy seaport. As a result, the Motorola PTP 400 delivers the level of dependability the USCG needs, even amidst a high amount of interference, so real-time live data is seen immediately, keeping the Port of Miami safe.

At the time of this installation, the products deployed were the Orthogon Systems OS-Gemini point-to-point wireless Ethernet bridges. With Motorola’s acquisition of Orthogon Systems, the OS-Gemini products were renamed as the PTP 400 Series bridges. They are now part of Motorola’s **MOTOwi4™** portfolio of innovative wireless broadband solutions that create, complement and complete IP networks. Delivering IP coverage to virtually all spaces, the **MOTOwi4** portfolio includes Fixed Broadband, WiMAX, Mesh and Broadband-over-Powerline solutions for private and public networks.

MOTOwi4™

Why Motorola Point-to-Point?

- Broadband wireless connections were not possible with other products because they could not maintain a connection across long-range paths
- Motorola cost-effectively provided highly reliable connections (35-43 Mbps) in high-interference areas
- 128-bit FIPS 197 AES encryption is employed so security is not compromised
- Even when space was limited, the PTP 400 Series solution was deployed in such a way that enabled it to meet high-bandwidth requirements

About Motorola

Motorola is known around the world for innovation and leadership in wireless and broadband communications. Inspired by our vision of Seamless Mobility, the people of Motorola are committed to helping you get and stay connected simply and seamlessly to the people, information, and entertainment that you want and need. We do this by designing and delivering "must have" products, "must do" experiences and powerful networks – along with a full complement of support services. A Fortune 100 company with global presence and impact, Motorola had sales of US \$36.8 billion in 2005. For more information about our point-to-point products and services, visit our website at www.motorola.com/ptp.



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