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Solution: Cradlepoint NetCloud Service   ▪   **Industry:** Environmental Research   ▪   **Use Case:** HD Video Livestreaming

First Nations Rangers Use 5G to Livestream HD Drone Footage to Community in Australia

Cradlepoint's 5G solutions provide high-performance connectivity for First Nations people to remotely monitor traditional land and sea Country

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Only 5G could enable us to combine traditional knowledge built over thousands of years with Western science to achieve sustainable outcomes not only for First Nations people, but for our whole community."

Dr. Kerry Blackman, chief executive officer, Gidarjil Development Corporation

Success story highlights

Challenge — In support of their mission to educate current and future generations in Queensland, the Gidarjil Development Corp (GDC) and its rangers must be able to share cultural and environmental data with a wide audience, including community Elders and scientific researchers. To accomplish this, the GDC decided to livestream underwater and aerial drone footage from the shore to locations along the Queensland coast. The group began using mobile broadband but quickly realised 4G performance wasn't sufficient for a bandwidth- and latency-sensitive application.

Solution — With a grant from Australia's Federal Government 5G Innovation Initiative, GDC partnered with MobileCorp to implement Cradlepoint's NetCloud Service and ruggedised 5G outdoor adapters to provide high-bandwidth, low-latency connectivity to the Telstra 5G network. GDC was able to effectively livestream 1080p HD footage from underwater and aerial drones directly to the Gidarjil community and scientific partners.

Benefits — With high-performance 5G adapters and centralised, cloud-based management capabilities, GDC has the confidence and ability to set up 5G connectivity in various locations and troubleshoot remotely. This easy-to-deploy 5G solution gives livestream viewers the ability to see cultural heritage sites up close, and provide real-time input based on generational knowledge related to the care of the sites and regional ecosystems.

Background and Challenges

When tribes in the Port Curtis Coral Coast Region saw a need to create an organisation that would elevate environmental management practices while nurturing community and cultural relations throughout the State, the Indigenous-owned GDC was born.

"The tribes decided to do something that would benefit our people, improve the quality of life, and establish an economic base, an environmental base, a commercial base, and a business base," said Dr. Kerry Blackman, chief executive officer, GDC.

To help execute its mission of caring and connecting to Country, the GDC established a land and sea program whose rangers use aerial and underwater drones to monitor the health of coral and seagrass; track sea turtle and dugong populations; support cultural burn activity; manage feral animals; and create land and sea maps. With a large part of their working knowledge coming from the wisdom of tribal Elders, the GDC wanted to find a way to include current and upcoming generations of First Nations people in the drone expeditions in real time.

"We can't afford to lose that traditional knowledge from our Elders, so we want to be able to capture their knowledge to create long term, sustainable management of the environment and of our land and sea Country," Blackman said.

While the GDC and its rangers wanted to give community Elders and environmental stakeholders a firsthand experience, challenges were evident from the start.

Travel limitations

Physical barriers including topography and distance made it virtually impossible for Elders to attend aerial and underwater drone expeditions.

"We've never been able to experience seeing things underneath the water," said Aunty Melinda Holden, a Gidarjil Elder. "We've only been able to surmise what's there based on the stories our old people have told us."

Unreliable cellular connectivity

In an innovative effort to include Elders, researchers, and other local organisations, Gidarjil rangers attempted to livestream drone footage over a 4G cellular network, but the transmitted video was low quality with poor definition and colour, that led to a negative user experience and was ultimately unusable.

Limited technical expertise

Although advanced connectivity and streaming technologies existed in the market, the Gidarjil team and drone operators had limited network expertise and no dedicated IT staff to manage setup or troubleshooting.

"There are engineers on the team, but they specialise in building physical structures – their core competencies are not centred around systems or network engineering," said Phill McSherry, chief technology officer, MobileCorp.

Solutions

In 2021, the GDC partnered with MobileCorp and two drone vendors to apply for a grant through the Federal Government 5G Innovation Initiative. The successful application resulted in grant funding for a 5G-enabled video project that allows the Gidarjil rangers to livestream HD video footage of underwater and aerial drone missions to viewers in remote locations.

Part of the grant funding was allocated to the purchase of three Cradlepoint 5G outdoor adapters. The adapters were connected to directional antennas pointing to the nearest Telstra 5G tower broadcasting in both 850 MHz and 3500 MHz bands, providing low- and mid-band 5G connectivity that facilitated the live transmission of high-quality video obtained by tethered underwater drones and Wi-Fi-enabled aerial drones.

Benefits

Enhanced livestream experiences over the 5G broadband network

After struggling with lackluster video quality on the 4G network, 1080p HD video streaming over 5G was a completely new experience for the GDC, its rangers, and the Gidarjil community. The Cradlepoint adapters helped facilitate livestreaming with low latency and clear imagery.

"It's like we're walking on Country without actually walking," Holden said. "It will give us a lot more knowledge that we have missed out on, that our Elders weren't able to pass down to us."

Simple setup and improved mobility

Despite their limited technical experience, Gidarjil rangers were able to set up the Cradlepoint adapters in minutes and establish Power over Ethernet (PoE).

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> **The Cradlepoint adapters worked perfectly on day one, and the team raved about the simplicity of setup."**
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> **Phill McSherry,** chief technology officer, MobileCorp

The ease of deployment also made it easy for the GDC to send adapters to audience locations in addition to drone mission sites to ensure reliable 5G connectivity at both ends of the livestream. After each use, the Cradlepoint adapters are packaged in kits that include a 5G antenna and mounting mast. These kits are easily transported to drone missions and audience viewing sites throughout the State and can be used to provide enhanced connectivity on boats offshore.

Remote troubleshooting through a cloud-managed platform

Through Cradlepoint NetCloud Manager, MobileCorp remotely assists GDC with adapter activation and troubleshooting.

"I can use the NetCloud platform to monitor the adapter performance and provide positioning recommendations without being physically onsite," McSherry said.

Using real-time data and speed tests within the cloud management platform, users can determine the best possible location and positioning of the 5G adapters to ensure rangers and livestream viewers have the highest quality of experience.

Protection against climate-related hardware failure

"Because they're being set up outdoors and on shore, it's important for us to have a device that won't degrade in dust, water, and heat. The Cradlepoint adapters are ruggedised to operate in those elements," McSherry said.

With the ability to withstand damp coastal conditions and temperatures up to 70 C (158 F), Cradlepoint 5G adapters are primed to continue working even in harsh, unpredictable climates.

Opportunities for future professional and technological growth

The flexibility and speed of 5G create a platform for the GDC to act on its forward-thinking innovation. With plans to integrate remote audience control of underwater and aerial drones as well as deliver drone training to other organisations, the continued connection of culture and Country will thrive with Wireless WAN connectivity on the 5G network.

Learn more about what 5G can do for your business at cradlepoint.com/products/5g-for-business