Non-Profit

Protecting ecosystems on the edge

Island Conservation

Island Conservation worked with Lenovo's Work for Humankind initiative to protect endangered wildlife and support the community on Robinson Crusoe Island with fast Internet connectivity and powerful servers that bring AI to the edge of the network.

Photo credit: Callum Thompson

1

Who is Island Conservation?

Island Conservation is an international non-profit organization that restores island ecosystems to benefit wildlife, oceans, and communities by removing invasive species.

For several years, Island Conservation has been working with the local community to protect endemic and threatened plants and animals on Robinson Crusoe Island, a Pacific island approximately 400 miles off the coast of Chile, by removing a primary threat—invasive coatis. Robinson Crusoe Island is home to more than 100 endemic plant species, as well as several threatened or endangered bird species such as the Juan Fernández firecrown, the Masatierra petrel, the pink-footed shearwater, and the Juan Fernández tit-tyrant.

ISLAND CONSERVATION
Preventing Extinctions

2

The Challenge

To protect Robinson Crusoe Island's population of pink-footed shearwaters, Island Conservation removes invasive coatis from the bird's nesting sites. To monitor the success of these efforts, the organization installed more than 70 camera traps at nesting sites across the island. Footage from the cameras needs to be collected and analyzed to detect any new coati activity.

The cameras generate approximately thousands of new images every day—far too many to review manually. Until recently, the only effective way to trawl through the huge volume of images was for volunteers to collect the hard drives from each camera and ship them out on the bi-monthly plane to Santiago, where they could be analyzed.

This was a problem, because the time elapsed between a camera trap detecting a coati and the team getting the results of the analysis could be up to three months—more than long enough for the coatis to re-establish themselves and cause serious damage to a shearwater nesting site.

The root cause of the issue was that the island's satellite Internet connection was far too slow to send any meaningful number of images to the mainland over the network. This also limited the island's 900 residents' access to digital services, education, healthcare, and communication with the wider world.

> **"The time between when we detected an invasive species on a camera and when we were able to respond was three months. This meant we didn't have enough time to make the kind of decisions we needed to make to prevent extinctions on the island."**

David Will
Head of Innovation, Island Conservation

Building a partnership with Work for Humankind

Lenovo's Work for Humankind initiative sent a team of 16 volunteers to the island, tasked with upgrading the Internet connection from 1 Mbps to 200 Mbps and building a new technology hub.

The hub provides Lenovo IdeaCentre PCs, ThinkBook, ThinkPad, Legion and Yoga laptops, and ThinkSmart, ThinkReality and Mirage devices that give the population the ability to videoconference with family and friends anywhere in the world for the first time. It also provides access to LanSchool education software, which will be used by the local school.

Hardware

Lenovo ThinkEdge SE450 Edge Server
Lenovo IdeaCentre PCs
Lenovo ThinkBook laptops
Lenovo ThinkPad laptops
Lenovo Legion laptops
Lenovo Yoga laptops
Lenovo ThinkSmart virtual meeting devices
Lenovo ThinkReality A3 smart glasses
Lenovo Mirage VR S3 headsets

Software

LanSchool education software

Services

Lenovo Work for Humankind

Within the technology hub, Lenovo also installed ThinkEdge SE450 edge servers—compact, ruggedized servers with integrated GPUs for rapid AI inferencing. Designed to run almost silently even in high heat, dust, and vibration environments, the ThinkEdge servers are ideal for locations like Robinson Crusoe Island where the protected environment of a traditional data center is not available. The servers are also monitored and managed remotely by Lenovo technicians, so there is no need for Island Conservation to have technical experts on-site.

Island Conservation uses the ThinkEdge servers to feed its camera trap images into machine learning models that can process 4.8 images per second—or 415,000 per day. By filtering out images that don't show any traces of coati activity, these AI models dramatically reduce the number of images that need further analysis by the team in Santiago. As a result, the data payload is small enough that team on the island can send the images to the mainland via the Internet, instead of shipping hard disks out by plane.

Photo credit: Callum Thompson

“The ThinkEdge server technology allowed us to bring data center computing capabilities from the mainland to the island, so we can run machine learning to expedite image processing and take decision time from three months to a matter of weeks. This accelerated response time means more birds protected from direct predation and faster population recovery.”

David Will
Head of Innovation, Island Conservation

3

Results

In terms of raw image processing power, the Lenovo ThinkEdge servers at the technology hub on Robinson Crusoe Island are twice as fast as the supercomputer that was previously analyzing the images in Santiago. As a result, when the Island Conservation team started using the solution, they were able to process six months' camera trap data in just one week.

The real advantage of performing the initial analysis at the edge of the network is that it dramatically reduces time to insight for the Island Conservation team. Today, once they have collected the hard disk from a camera trap, they can start getting insight almost immediately. So, when a coati is detected at a nesting site, they can spring into action, fast, protecting birds from predation.

The partnership with Lenovo's Work for Humankind project also has a broader positive impact on island society. By increasing the speed of Internet connectivity by a factor of 200 and providing a state-of-the-art technology hub for island residents, Lenovo has helped bring the island closer to the global community. 30% of the population have already used the hub, and adoption is likely to increase as the island's school starts using the LanSchool software.

Pablo Manríquez Angulo, Mayor of Robinson Crusoe Island, concludes: “The volunteers from Work for Humankind have laid down the foundations to really help a remote island community make a positive difference. Now, through the Lenovo legacy, it’s up to our community to continue making significant headway, armed with new skills, and inspired by their passion.”

- 415,000 images processed per day by AI models
- Months to minutes reduction in time-to-insight
- 200x faster Internet connectivity for island residents
- 30% of the population use the Lenovo technology hub

Photo credit: Callum Thompson

“Thanks to the collaboration and technology provided by Lenovo, we have effectively overcome the barriers we previously faced. We’ve completely transformed the way our team works, as we are now able to significantly reduce precious time spent waiting for analysis to help us achieve our goals.”

David Will
Head of Innovation, Island Conservation

Why Lenovo?

The Island Conservation partnership began when David Will met Charles Ferland, Vice President and General Manager of Edge Computing at Lenovo through the Work for Humankind initiative. Lenovo donated not only the technology to upgrade the island's Internet connection, build the technology hub, and deploy the ThinkEdge servers—it also provided the expertise that the project needed.

16 volunteers from Lenovo teams around the world were invited to take part in a once-in-a-lifetime opportunity—to spend several months living on Robinson Crusoe Island, working their normal jobs remotely from the technology hub, and volunteering their time and skills for the island's conservation effort.

How can edge computing help conserve plants and animals?

Protecting endangered wildlife and supporting the community with Lenovo Work for Humankind.

Explore Lenovo Work for Humankind