Content by Lenovo + Intel

© Callum Thompson, Lenovo Work For Humankind

Lenovo Gives Wildlife Conservation an Edge

How Lenovo's Work For Humankind project and a nature conservation group created a one-of-a-kind edge-computing experiment at the edge of the world.

IT'S AN AGE-OLD QUESTION: If you were stranded on a remote island, what would you bring?

For some of us, the answer might be a favorite book, or—for the more practically minded—a water-filtration system or signal flares. For the conservationists working to save endangered species and the fragile ecosystem on Robinson Crusoe Island, arguably the most remote island on Earth, it turns out that the answer is Lenovo's edge computing solutions with AI capabilities.

© Island Conservation

A Race Against Time

The island—700 kilometers off the coast of Chile—is 50 square kilometers of forests, volcanic mountains, and beaches. It's also home to several species of flora and fauna that cannot be found anywhere else on the planet. But since humans began coming to the island some 500 years ago, they have introduced invasive species such as rats, coati, and goats. As a result, native species such as the Juan Fernandez firecrown hummingbird and the

Pink-footed shearwater have reached the brink of extinction and the island's old-growth forests have died off.

In total, six bird species and 17 tree species are in grave danger. In a race against time to save them, a group of conservationists has partnered with Lenovo in its **Work For Humankind** project to use technology to accelerate and supercharge their efforts to save these species—as well as benefit the permanent inhabitants of the island.

Bridging the digital divide, Lenovo set up a first-of-its-kind technology hub on the island—packed with its high-performance smart devices for productivity, connection, and collaboration. What's more, the company has offset the carbon emissions of these devices.

© Island Conservation

The team is also using edge computing and the Lenovo ThinkEdge servers powered by 3rd Gen Intel®Xeon®Scalable processors with built-in AI acceleration. These edge servers process huge amounts of data from cameras and sensors throughout the island—powering conservation in the world's remotest locations.

Though islands comprise only about 5% of the world's landmass, they possess approximately 20% of the world's biodiversity.

Because their ecosystems are so fragile, islands have become the epicenters of extinction. In fact, the overwhelming majority of reptile, bird, amphibian, and mammal extinctions have occurred on islands, and a staggering 86% of those recorded extinctions have been caused by invasive species.

© Callum Thompson, Lenovo Work For Humankind

Nature Meets Technology

David Will has spent his career trying to change those numbers.

Will is the Head of Innovation at Island Conservation, an organization that protects endangered species by removing invasive species. Early on, he spent a year and a half on California's San Nicholas Island tracking invasive species.

"I can tell you, one of the most depressing things is waking up every day and hoping you don't find a footprint of an animal in the sand," Will says, "because if you find it, it means you've got another couple of months trying to chase it."

Will's mission is to implement technological solutions to make curbing invasive species more time- and cost-efficient. For years, Island Conservation had been working with the community of Robinson Crusoe to remove invasive species when the organization spearheaded an ambitious project of placing 70 wildlife cameras across the island to track the progress of their removal efforts.

© Callum Thompson, Lenovo Work For Humankind

Once every few weeks, volunteers would hike up to 13 hours to collect the SD cards from the cameras. Then they would wait weeks to send hard drives via plane or barge to a data center in Santiago, Chile, where the photos were analyzed.

"It's not so much the problem of 'Is there a needle in a haystack?' as the problem 'Is there no needle in the haystack?'" Will says. Missing a few invasive animals will almost inevitably lead to the species reestablishing themselves, sometimes in just a matter of months.

But by the time Island Conservation staff could sort through and refine the results, months would pass, rendering the data virtually obsolete and making it impossible to act in real-time—giving invasive rats and coatis the chance to repopulate.

"I didn't know that you could bring the power of a data center to a particular edge location," Will says.

But that changed when he met Charles Ferland, the Vice President and General Manager of Edge Computing at Lenovo.

© Callum Thompson, Lenovo Work For Humankind

A Cutting-Edge Partnership

Ferland and his team are used to projects that push the limits of computing in service of human good. For example, they are using 5G technology to transform Barcelona into a smart city of the future.

“Smarter technology means helping our customers solve some of humanity's greatest challenges,” Ferland says. And solving those challenges means the team is working, quite literally, at the edge.

Partnering with Island Conservation and the residents of Robinson Crusoe Island was a natural fit. But the remote nature of the island and lack of digital infrastructure presented a new challenge. Before its partnership with Lenovo, Robinson Crusoe Island was, for all practical purposes, digitally isolated. The approximately 1,000 residents of the island shared a 1-Mbps internet connection, rendering it useless for Island Conservation’s efforts to analyze the staggering amounts of data collected from cameras.

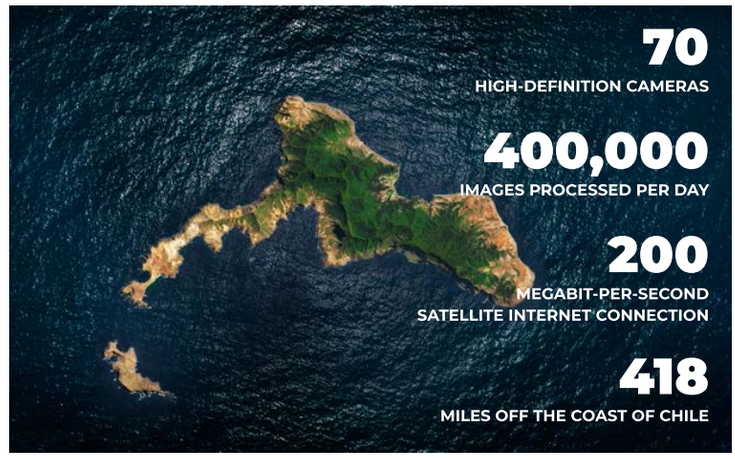
As part of its effort to redefine Work From Home as Work For Humankind, Lenovo donated and installed an island workspace with a range of its powerful devices and solutions, including Lenovo ThinkPad, ThinkBook, Legion, and Yoga PCs; Motorola edge smartphones; ThinkSmart collaboration devices; ThinkReality augmented reality smart glasses, and more. Then volunteers were invited from around the world to take part in a once-in-a-lifetime opportunity—to work their day jobs completely remotely using Lenovo’s tech and then volunteer their time and skills for the island’s conservation effort.

In addition, Lenovo upgraded the island’s internet to a 200-Mbps satellite connection. Yet even with the Island’s upgraded internet connection, it was impractical to send massive amounts of data from all 70 high-definition cameras to the cloud for analysis.

LENOVO LEGION 7i LAPTOP

Related products used in the Work For Humankind Project

Ferland's team knew they needed to bring supercomputing power to Robinson Crusoe Island, where the data was being created. But installing a data center wasn't a feasible solution because of the island's extreme temperatures and humidity. What's more, the salt in the ocean air would be extremely corrosive to conventional data centers.



Ruggedized Servers to the Rescue

The solution was Lenovo's ThinkEdge SE450, an AI-optimized edge server with a rugged design capable of withstanding extreme conditions while running quietly, allowing it to live comfortably in the new remote workspace. Lenovo worked with Island Conservation to tailor the server to its needs, adding additional graphics cards to increase the AI processing capability per node.

"We took the supercomputer capability they had in Santiago and brought that into a form factor that is much smaller," says Ferland.

The ThinkEdge SE450 eliminated the need for on-site technicians. Unlike a data center, which needs staff on-site, the ThinkEdge server could be monitored and serviced remotely by Lenovo team members. It proved to be the perfect solution.

Lenovo's ThinkEdge SE450 Edge Server allows conservationists to process 4.8 images per second. That's more than 400,000 photos per day. Then, only the most relevant images are sent via the satellite internet connection to the mainland for further analysis. Thanks to the Lenovo AI server powered by 3rd Gen Intel®Xeon®Scalable processors, and boosted connectivity, the island's conservation projects are seeing efficiencies that include a 100% jump in image-processing speed. Even in its initial stages, the collaboration has been a quantifiable success in the real and substantial benefits it has shown.

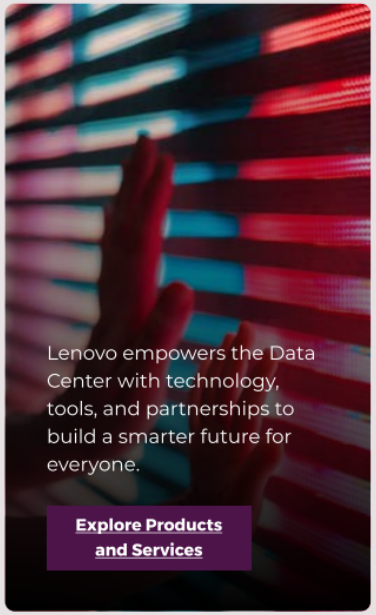
But there is always room to improve. Currently, the AI algorithm detects only the differences between flora and fauna, but with time, it can be trained to detect specific types of invasive flora and fauna with much greater accuracy. In the future, there may be opportunities to connect the cameras to a 5G network, eliminating the need to manually gather the SD cards.

On the Bright Horizon

For Will and the team at Island Conservation, Lenovo's edge computing solutions have opened a world of possibilities for conservation. But the promise of edge computing stretches far beyond preserving fragile ecosystems. Lenovo's ThinkEdge servers are being used by doctors in remote locations and humanitarian crisis zones to give them the same computing power they would get from urban hospitals. They're onboard the boats of fishermen in the Gulf of Mexico, who use the ThinkEdge server's AI capability to monitor catches, alerting them when a fish is caught that is either endangered or too small to keep.

On Robinson Crusoe Island, recovering the biodiversity hasn't been easy, but implementing Lenovo's technology resources has given the effort a quantum leap forward. And once a single species recovers, the effects can cascade—improving the ecosystem "from ridge to reef," as Will says.

Lenovo and the Lenovo logo are trademarks or registered trademarks of Lenovo. Intel, the Intel logo, and Xeon are trademarks of Intel Corporation or its subsidiaries.

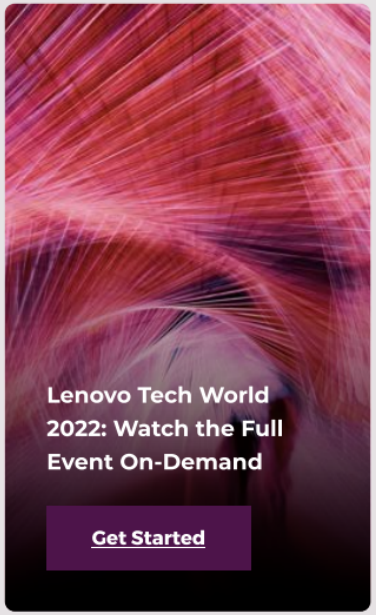


Lenovo empowers the Data Center with technology, tools, and partnerships to build a smarter future for everyone.

Explore Products and Services

Explore Smarter Infrastructure Customer Stories

Watch Now

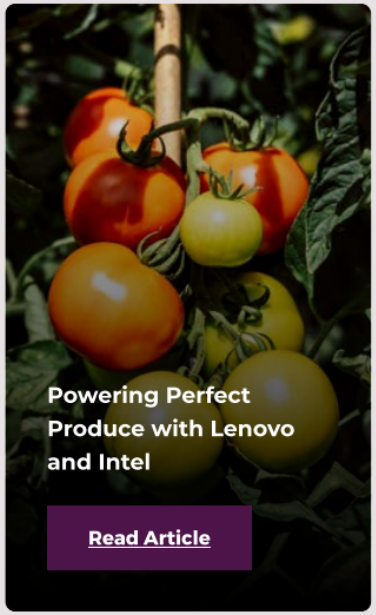


Lenovo Tech World 2022: Watch the Full Event On-Demand

Get Started

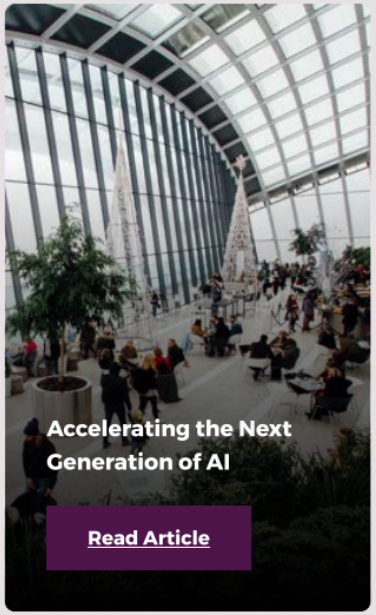
Intel and Lenovo - Pioneering Together

Learn More



Powering Perfect Produce with Lenovo and Intel

Read Article



Accelerating the Next Generation of AI

Read Article