



Will Townsend: I want to thank all of our viewers for tuning into this Lenovo section of The Six Five Summit. We have both Lenovo and one of its customers, Island Conservation. Welcome gentlemen.

David Will: Hello, great to be here. Thanks.

Will Townsend: Hey David, let's start with Island Conservation. Could you provide an overview of your mission and some of the challenges that you're facing with respect to your research efforts?

David Will: Sure, thanks Will. Island Conservation prevents extinctions by removing invasive species from islands. We work on islands because that's where there's the biggest concentration of threatened species and biodiversity is the greatest and islands represent 5% of the world's land mass, but host 20% of the world's biodiversity. The islands are extinction epicenters, 75% of reptiles, birds, amphibians, and mammal extinctions occur on islands. And if we look at the problem of those extinctions, invasive species are the leading cause to introduced animals. Rats, cats, goats, and pigs have been introduced onto islands and are implicated in up to 86% of all recorded extinctions on islands. So if we want to have a really big impact to preventing biodiversity loss, working on islands and working on the problem invasive species is one of the most impactful ways that we can do that. And we know that removing invasive species is a proven conservation tool, it's occurred on more than 1,200 islands worldwide with remarkable results.

We've seen species that were previously only alive because of captive rearing, considered extinct in the wild, that have returned following the removal of invasive species. In species that were only known to be recorded in fossil or known to science, being discovered after removing invasive species, we're seeing these remarkable conservation gains. We also see ecosystems flourish with forest recover, and we're seeing nutrient cycles, from sea birds to coral reefs, being restored as well. Leading to increased fish bio mass, so there's this really remarkable thing that can happen when you restore and rewild these islands by removing invasive species. But there're challenges to that, and Island Conservation has a proud history of looking innovatively to figure out how can we increase the scale, scope, and pace of this proven conservation tool and how can we do that faster, cheaper, and safer? And my role as head of innovation, is really focused in on that.

And so one of the key problems that we face, is detecting if the problem of invasive species is gone. So it's not, is there a needle in the haystack, but is there no needle in the haystack? And how do you be confident that your proven conservation action has actually been successful? About 30% of our project activity is spent looking for proving that the project has been successful. And so that looks like thousands of kilometers of hiking around an island, hundreds of thousands of votes collected and conventional best practice is spending two years wandering around an island, trying to figure out if you've actually solved the problem. We know that can be done faster with modeling, but you need data in a timely fashion to be able to do that. And we know that in a continental system, a lot of what's being talked about here with artificial intelligence, IOT, those kinds of tools exist, but on islands, they're remote. There's no internet, so everything is done manually.



And so a lot of what we need to do is overcome those kinds of challenges and one of the projects specifically that we're working on is in Robinson Crusoe, in Chile. It's a couple of thousand kilometers off of the coastline of Chile and it's home to the Pink-footed Shearwater, which lives on only five islands in the world. And it's impacted by again, some damaging invasive species and our team out on the island has cameras, trail cameras that collect photos when things walk by. There's 70 of them have scattered across the island and one of the biggest challenges we have is going out and collecting those manually.

So it takes 13 or 14 hours to get to some of these sites to collect them, bring them back into the town area and then because there's no internet infrastructure or computing infrastructure on the island, all of those have to put onto a hard drive, shipped off on the plane every two weeks, out to mainland Santiago and then there for processing. So, when we're looking at the time between a detection event on a camera and actually being able to do something about it, we're talking in months, which is a huge delay. And so, trying to figure out how can we be more efficient with our conservation dollars? How can we save species? We need real time information and that looks like solving the data delivery problem, the data processing problem, the data management problem.

Will Townsend: Now Charles, this represents the most extreme Edge Computing scenario, power challenges, I believe there's only satellite connectivity to the island, right? And so what Island Conservation is working with are these large amounts of data. This really presented Lenovo with a huge challenge, so I'd love it if you would spend some time and sort of talk about how you sort of broke this apart, helped them become more efficient and then talk a little bit more broadly about your Edge portfolio capabilities.

Charles Ferland: Well thank you Will and indeed it is a very interesting use case and we are very excited to be partnering with the Island Conservation here, to work on very concrete cases. As you can imagine, network connectivity is very rare or at a premium, in those locations. So using networking to take the amount of data created at the Edge by these 70 cameras, it's too expensive or actually it's impossible, right? So, the idea here is that there's a huge amount of data being created at the Edge on this island, but we don't have the network capability to bring it off and computed in real time. So, we brought the ... that's a definition of Edge Computing in reality is to take the compute capability of the data center and bring it closer to where the data is created, directly under Robinson Crusoe Island, off the coast of Chile.

So in that context, we took a ThinkEdge SE450, which is one of the highest performance Edge server for AI and brought it directly onto the island. So the data is still connected and processed on the island, on one of these servers on the ThinkEdge SE450. We went from weeks or months to get insight to how many animals are crossing this path, or non-animals crossing this path as Will, as David mentioned, to getting the ability to process several hundred thousands image every hour or in a few hours on the island itself. So we can get the results the same day and that is very important. And that's a challenge that we wanted to address in introducing the compute, the Edge Computing capability directly on the island. Now you can imagine there's no data center, right?



A normal data center, server would not necessarily behave well, because there's a lot of humidity in the air, there's salt from the ocean, there's a lot of dust, heat, and temperature differences and all that. So we needed to have a more regularized Edge server, to be able to process the data and still work in a more regularized environment or more harsh environment. We also look at a remote connectivity for that server. So while the people are working on the island, they don't necessarily have an IT technician on the island to manage the server. So, having remote access to the server using Lenovo Administration Tool, allows a technician anywhere in the world to take access to the server and troubleshoot or fix any of the issues that might happen on the island, without having to send a technician on site. So these are some of the challenges that we addressed with our Edge computing. And this is a great use case is that result gets very concrete and very appealing results.

Will Townsend: So Charles, have you and the team learned anything from this experience that you're able to take to maybe more traditional customers that are trying to manage neck infrastructure?

Charles Ferland: Well, power is a premium and we knew this at the Edge, but in this context it's even more so, right? So having power efficient systems is very important and that is one of the key learning that was validated throughout this exercise. Even the next step, is how do we introduce Edge Computing even closer to where the cameras are located and process the information at that point? But then it becomes a challenge say the closer you have your compute capability, then the more power you need. And if this is in the middle of a forest, you don't necessarily have access to power very easily, right?

That's one of the things, but overall in general, what this represents is we see more and more use cases that require Edge Computing because of the networking capability being a premium or limitation, or in some other cases, because they need to have a faster time to insight. For example, in worker safety use cases in factories or in some of the farming environments, you cannot bring the network capability. You cannot have a full data center environment and therefore having regularized Edge servers operating directly at the edge, really help them solve, process the massive amount of data and get the insight and take an action, like the Island Conservation Organization is doing right now.

Will Townsend: Hey David, I'm curious, have you learned anything from this experience partnering with Lenovo? Are there any opportunities to sort of expand what you're doing around your mission?

David Will: No, we've certainly learned a lot. I think one of the things, Island Conservation is a global organization, but we're relatively small and we're always partnering with local communities and the places that we work. So a big portion of this was not just bringing the infrastructure that's computing to the island, but also making sure that the island itself, the community could benefit from that. And so how can that community, which now has internet access for the first time in a reliable way, how can that be managed and used to advance their own sustainable development vision beyond just the conservation applications? And so I think that's a really big thing for us to take is, how can the problems that we're trying to solve from conservation, how can those also benefit all the communities?



Because all of those things are always kind of in sync, as to the only way to get these projects done, is to be working hand in hand with the communities that we're working with. And we, Island Conservation and our partners at the Our Oceans conference in Palau last month, launched the Island Ocean Connection Challenge to restore 40 global important marine island ecosystems by 2030. And there's a big number of backers of Rewild and scripts and a couple of the government of Panama and Palau and a number of other partners that are getting behind this. But it really shows the potential for these kinds of solutions and the scalability behind it, and that it's not just Robinson Crusoe Island. There's a whole number of islands around the world that need these sorts of Edge Computing cases and this kind of partnership that we've launched with Lenovo, of how can that scale to really address the problems of biodiversity climate change and sustainable development in all these really important places.

Will Townsend: It's really a beautiful use case, it's near and dear to my heart. My second home is in the Florida Keys and we're dealing with invasive lionfish and even iguanas, if you can believe it, they're not native to the area. But this is such a fantastic use case and David, Charles, it's been a great conversation. Charles, any final thoughts before we wrap up?

Charles Ferland: Thank you very much. Well, no, it's been a pleasure to collaborate with the Island Conservation and to work with the Robinson Crusoe island community to build a technology hub. Lenovo provided a lot of equipment and for the local population to have access, we upgraded the internet connectivity to have more bandwidth. But also continuing to work with the Island Conservation to not only process the data, but we have some of our data scientists now working with them to try to identify a lot more precision of the species and the animals that are being captured on the cameras. So this is an ongoing journey and we're excited to be part of that venture. Thank you.

Will Townsend: Excellent. Well, it's been a great conversation, gentlemen, Charles, David, thank you very much and thank you to the viewers for tuning in today.

Charles Ferland: Thank you.

David Will: Thank you.