Tackling antibiotic resistance with AI-powered livestock health management.

How **Serket** uses Lenovo ThinkSystem SE350 Edge Servers powered by Intel® Xeon® processors and NVIDIA® T4 GPUs to enable AI-driven monitoring of livestock on farms where internet connectivity is poor—doubling its client base in just 12 months, empowering farmers to minimize the use of antibiotics, and contributing to a healthier planet.

Lenovo Infrastructure Solutions for The Data-Centered

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Background

Founded in 2016 in Amsterdam, Netherlands, Serket is a livestock technology company offering an advanced AI solution that uses camera vision to enhance farm productivity and promote the health of individual animals. By monitoring changes in animal behavior in real time, Serket enables farmers to identify sick livestock and intervene rapidly: shrinking mortality rates, reducing feed and veterinary costs, and minimizing the use of antibiotics.

To help feed a growing world population, livestock farming will remain an important ingredient in the global agriculture mix for years to come. Use of antibiotics in farming is an issue of global significance, as it is one of the primary contributors to antibiotics-resistant bacteria. This phenomenon is a major concern for international healthcare organizations, because it has given rise to 'superbugs': strains that infect both people and animals, and that are extremely difficult to treat.

Kristof Nagy, Founder & CEO at Serket, explains the reasons behind the use of antibiotics in livestock: "In farmed animal populations, wounds and illnesses can kill very quickly—for example, the mortality rate for pigs is currently around 16 percent, and scrapes and cuts that become infected can cause death in less than a week without treatment.

"With early intervention, many illnesses affecting animals can be treated without large-scale use of antibiotics. However, because of the limited budgets and labor shortages in many parts of the global farming community, the challenge is that most farms don't have the resources to watch their livestock around the clock for the first signs of a problem. As a result, farmers are often forced to fall back on antibiotics to treat illnesses, contributing to the global challenge of antibiotics resistance."
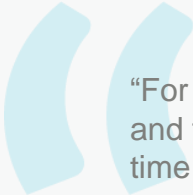
Challenge

Start-up company Serket aims to help farmers solve this issue once and for all. The company has developed an innovative solution that uses AI to analyze real-time camera feeds, and detect potential health problems in livestock populations with a high degree of accuracy.

"We saw a major opportunity to transform the process for the good of the farming industry, livestock, and people everywhere," continues Kristof Nagy. "Our solution allows animals to be monitored 24/7. If we detect patterns of behavior that are consistent with illness—for example, pigs drinking more than usual or moving abnormally—we can immediately alert the farmers, so they can take targeted action quickly and avoid the need for drugs."

As Serket prepared to put its solution into production, it encountered a significant roadblock. The company's AI solution runs in the cloud, but many prospective clients are located in remote areas where internet connectivity is limited. To realize its ambition of reaching farmers across Europe and around the world, Serket looked for an alternative approach.

"For some of our clients, the availability of high-speed broadband and fiber internet connections on the farm allows us to analyze real-time camera feeds using the cloud. To serve prospects in more remote areas, we began exploring other technology solutions."

Kristof Nagy
Founder & CEO, Serket

Why Lenovo and NVIDIA? Rugged edge solutions that scale seamlessly.

Initially, Serket considered working directly with telecoms providers to help build new communications infrastructure in areas that lacked high-speed internet connectivity. However, the company determined that this approach would be too complex, costly, and time-consuming—reducing its ability to scale its solution globally. Instead, the company began to investigate edge computing solutions, and quickly saw that they had the potential to meet all its core requirements.

Kristof Nagy recalls: "We aim to scale up our operations across the USA and China over the next four years—with the ultimate objective of becoming the global leader for livestock monitoring across all animal species. The ability to run some compute workloads for our AI solution at the edge will be critical to make the most effective use of limited connectivity in many parts of the world."

Since its foundation, Serket has partnered with NVIDIA® to develop and run its AI solution using the NVIDIA Metropolis application framework. After evaluating several edge computing providers recommended by NVIDIA, the company selected Lenovo ThinkSystem SE350 Edge Servers, equipped with NVIDIA® T4 GPUs, as its preferred technology platform.

"In addition to the reliability, performance, and robustness of their edge solutions, we were very impressed by Lenovo's commitment to our success," comments Kristof Nagy. "Lenovo went out of their way to help us configure an edge solution that met the specific operational needs of our AI and machine learning technologies."

"Lenovo made it clear from the start that they wanted to be a true partner to Serket on our business growth journey, which we greatly appreciated."

Kristof Nagy
Founder & CEO, Serket

Deploying rapidly.

Working in partnership with local Lenovo Platinum Business Partner HET IT, Serket has now deployed the Lenovo and NVIDIA edge solutions to around half of its client base, helping to ensure that farms everywhere can benefit from timely insight into health issues affecting their animals.

Kristof Nagy comments: "Deploying the Lenovo edge solutions couldn't be simpler—the technology is essentially plug-and-play, and we rarely need to call on Lenovo or HET IT to provide technical support. But if we do ever have a question, we know the help we need is only a phone call or an email away."

Integrated with 10 GbE network controllers, the new edge solutions run the Ubuntu Linux operating system and the technology platform for the Serket AI solution, based on Docker containers with NVIDIA CUDA®, NVIDIA DeepStream SDK, NVIDIA TensorRT, and the Kubeflow machine learning platform.

Waldo van Dijk, Sales Manager at HET IT, says: "We think Serket has an innovative solution that will greatly benefit the farming industry. We're delighted to support Serket by delivering Lenovo edge servers for their AI solution all across Europe."

"Farm environments can be humid, dusty, and hot, which means any technology we deploy there must be robust enough to withstand relatively harsh conditions. With rugged Lenovo ThinkSystem SE350 Edge Servers equipped with NVIDIA T4 GPUs, we have peace of mind that our AI-powered solution for livestock management will run 24/7."

Kristof Nagy
Founder & CEO, Serket

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Results

With edge computing solutions from Lenovo and NVIDIA supporting its game-changing AI technology, Serket is free to scale its innovative offering across Europe and around the world—helping to boost the sustainability of global agriculture and guard against the risk of antibiotic resistance.

"Unlike a pair of human eyes, our monitoring solution can keep watch over livestock 24/7, and detect health issues with up to 95% accuracy," says Kristof Nagy. "Crucially, our AI and machine learning technologies deliver this insight extremely cost-effectively, while also saving farmers money by allowing earlier—and therefore cheaper—health interventions. As a result, we are helping farmers to boost their profit margins by an average of 15%."

Today, Serket has access to 40 farms and offers real-time monitoring for millions of animals. Looking ahead, the company is confident that it has the resilient edge solutions to expand its offering globally. "Our business has already doubled in size in the last 12 months, and we're in a strong position to continue to drive fast-paced expansion," concludes Kristof Nagy. "With Lenovo and NVIDIA® at our side, we're poised to grow our share of a global livestock health management market valued at €400 billion."

SERKET

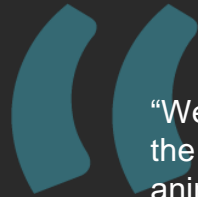✓ **Enables real-time monitoring for millions of animals**

✓ **Detects health issues with up to 95% accuracy**

✓ **Boosts farming profit margins by an average of 15%**

✓ **Scales rapidly to help increase Serket's share of a €400 billion market**

"We look forward to continuing our collaboration with Lenovo and NVIDIA® to minimize the use of antibiotics in agriculture, reduce costs for farmers, and contribute to greater animal welfare."

Kristof Nagy
Founder & CEO, Serket

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Lenovo ThinkSystem solutions?

The Data-Centered help to solve the world's most pressing challenges with Lenovo smarter infrastructure solutions, powered by NVIDIA®.

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