**Lenovo
AI Innovators**
Partner Ecosystem

✕ centific

Lenovo and NVIDIA power Pitaya, Centific's solution to drive operational efficiency in Retail

Centific allows retailers to reduce losses, improve safety, and manage their stock, from distribution centers and warehouses, to the retail store

Summary

Pitaya is a retail intelligence solution that uses a combination of cameras, sensors, and AI. It provides real-time insights for dynamic decision-making on shrinkage, customer behavior patterns and shelf/product analytics.

Pitaya offers retailers a simplified way to deploy AI solutions at scale with a Retail Ops in a Box approach. This helps bring faster time to value for retailers, empowering them to optimize the front of the store for increased revenue and faster transactions. Pitaya is the single pane of glass for all your retail operations and retailers can also enable enterprise grade integrations.

Challenge

Retailers face increasing pressure from competition and organized retail crime. Finding the right AI solution that integrates into their existing solution and improves operations and scales easily adds complexity to this process.

Customers need a solution that covers their entire value chain. They also need a solution that processes all the data from different operative areas and provides easy to use insights for decision making.

Solution

Lenovo and NVIDIA infrastructure allow Centific to offer Pitaya AI, a human centric retail solution that leverages multiple AI technologies (Computer Vision, Large Language Models, Deep Learning, and Neural Networks), together with your business, consumer, and in store visual data, to deliver insights across a range of retail use cases.

Pitaya offers customers the flexibility to use compute at the edge or in the cloud, leveraging in-store integration with devices, systems and solutions to strengthen and support decision making, actioning and evidence showcase. On the cloud platform side, Pitaya follows a multi tier and multi tenant architecture with role based access that enables data protection and privacy.

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Pitaya's features and technology

- **Fundamental AI Models:** Core AI models enable various in-store use cases, including object detection, identification, and re-identification, as well as vision understanding.
- **Accelerated CV and AI Contextualization:** Leveraging an end-to-end AI data platform for data operations, model training, and validation. Ability to create and manage private crowds for enhanced privacy at scale.
- **Unified Platform:** Bringing all AI use cases into one unified fabric and view, with the ability to integrate with multiple systems and manage multiple CV solutions.
- **GenAI-Ready:** Transforming stored footage into insights and actions with visual-language models (VLMs) such as summarization, Q&A, and real-time search.
- **Process Automation:** Executing tasks to free up store associates for other critical tasks, enhancing operational efficiency.

All these components are used together to process feeds in real time, capture key inferences and generate insights and actions for the end users at the point of occurrence.

Results

Centific's modular solution allows scaling from single to multiple use cases as well as the ability to integrate into additional systems of engagement via API. Pitaya AI allows retailers to manage and optimize their entire store operations including:

- **Protecting remote outdoor areas:** The solution detects loitering and vandalism and helps to protect outdoor equipment.
- **Improving workplace safety:** Detects spills and cleanup, hazardous items and improves employee safety. It can also detect abandoned or forgotten objects.
- **Damage prevention:** Centific's solution can identify opened boxes and damaged products.
- **Parking lot monitoring:** Detects abnormal behavior, abandoned objects and pedestrians.
- **Prevents self checkout shrinkage:** Integrates with hand scanners and identifies objects allowing for product counting and theft monitoring.
- **Sales and logistics management:** Allows for store layout improvement, route management, damage monitoring and adherence to safety protocols.

This solution connects to your existing IP cameras, VMS and POS for rapid onboarding with minimal disruption. It's simple to deploy, simple to integrate, and scalable from 10s to 100s of cameras. Centific's Pitaya platform is an open system so it is capable of consuming other API driven retail analytics system inputs.

Validated Architecture

The overall solution is comprised of two distinct workflows:

- **A forward workflow:** Comprising of Edge server, cloud workflow and Web application component as described in solution section.
- **A backward flow:** This flow takes care of all transfer of models, configurations and settings back to the edge device from the cloud infrastructure. This step ensures that the models located on premise are up to date and this is used to maintain the models using MLOps.

Pitaya leverages NVIDIA GPUs like NVIDIA RTX A2000, NVIDIA RTX A4500,NVIDIA L4, PCIe and CPUs like Intel Core i7-13700, Intel Yeon Silver 4410Y MCG, Intel Xeon Silver 4416+ for accelerated AI inferencing in store premise.
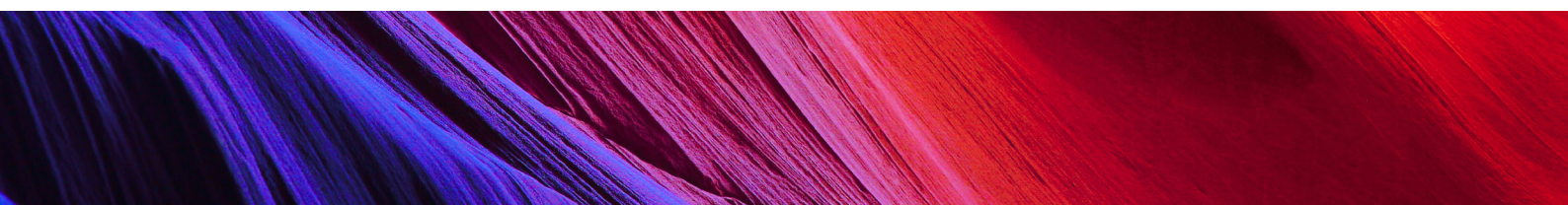
The overall deployment of Pitaya solution involves physical installation of edge servers on premise. Pitaya also utilizes existing cameras from the store and connects to the cameras using RTSP to make inferences. This is followed by creating a tenant on the cloud side to uniquely identify an organization. Further to this all the devices and use cases are mapped on the cloud side followed by transfer of these configurations back to the edge server.

The AI solution is trained in context of a given use case. It uses a combination of detection, augmentation and heuristics to create a skill that in turn enables a use case.

Design Components

	Servers	Cameras	Accelerator	Memory & CPU	Software
Edge	ThinkEdge SE350	8 cameras at 30 fps	NVIDIA A2	RAM: 16Gb CPU: 12C	Pitaya AI
	ThinkEdge SE360	8 cameras at 30 fps	NVIDIA L4 or 2 NVIDIA A2	RAM:32Gb CPU: 16C	Pitaya AI
	ThinkSystem SE450	15 cameras at 30 fps	2 NVIDIA A2	RAM: 64Gb CPU: 64C	Pitaya AI
	ThinkSystem SE455	15 - 75 cameras at 30 fps	1 or 2 NVIDIA L4	RAM: 96Gb - 128 Gb CPU: 32C - 64C	Pitaya AI

Resources

- Explore Lenovo's AI Innovators Program
- Explore the Lenovo HPC and AI Innovation and Briefing Center
- Lenovo Validated Design for AI Infrastructure on ThinkSystem Servers
- Centific Website
- Centific Human Centric Retail
- Lenovo-NVIDIA Alliance

Why Lenovo

Focused on a bold vision to deliver smarter technology for all, Lenovo is developing world-changing technologies that create a more inclusive, trustworthy, and sustainable digital society. By designing, engineering and building the world's most complete portfolio of smart devices and infrastructure, we are also leading an Intelligent Transformation to create better experiences and opportunities for millions of customers around the world.

Why NVIDIA

NVIDIA pioneered accelerated computing to tackle challenges no one else can solve. Our work in AI and the metaverse is profoundly impacting society and transforming the world's largest industries—from gaming to robotics, self-driving cars to life-saving healthcare, climate change to virtual worlds where we can all connect and create.