intel. **+** **Lenovo** | pathr.ai™

# Lenovo and Intel AI solution enables greater in-store growth with edge AI

**Pathr.ai's AI-powered solution uses existing camera infrastructure to deliver real-time insights that drive growth and reduce cost.**

Retailers are constantly evaluating how to maximize their business, deliver stronger customer experiences inside their stores and reduce operational costs. Online retailers have unprecedented visibility into shopper behavior, easily analyzing how long customers are spending on their site or which products customers ultimately purchase.

## Challenge

Brick and mortar retailers are often at a disadvantage when it comes to in-store insights. They don't have a true way to analyze customer behavior and movement in real-time, a critical component that can be leveraged to improve the effectiveness and profitability of their stores. Another challenge retailers face in acquiring in-store analytics is the costly hardware and disruptive installation process. Setting-up hardware requires store closures for days, even weeks - time a retailer can't afford to wait out.

## Solution

Lenovo, in partnership with Pathr.ai, offers an AI-powered spatial intelligence solution that allows retailers to better understand customer and staff behavior inside the stores in real-time – similar to website analytics today, and going beyond basic traffic counting solutions. By leveraging the store's existing camera infrastructure, traditionally only used for loss prevention, Pathr.ai delivers a scalable and non-disruptive solution that allows retailers to receive operations, merchandising, and marketing insights to drive growth and reduce operational costs, unlocking over 10 times ROI each year.

Pathr.ai's solution uses Lenovo ThinkEdge SE450 and Lenovo ThinkSystem SE350 edge servers, typically running Linux Ubuntu 20.04 LTS and Pathr.ai's edge applications to run its computer vision detection and video analytics at the edge (i.e., in a retail store). These AI-ready systems are powered by Intel® Xeon® Scalable Processors. They're optimized for the best performance on AI workloads, as well as validated for key capabilities in manageability, scalability, and security.

# 🖥️ Validated Architecture

Pathr.ai's edge application runs on a Lenovo edge server comprised of three components of the Pathr.ai software:

**1. Sensor Layer -** integrates with existing sensors and IoT devices. Predominantly in retail, this includes security cameras and network video recorders (NVRs). The Sensor Layer then processes the video feeds to anonymously locate and track where and how people move through a physical space.

**2. Behavior Engine -** contains analytics modules that are customized to a specific vertical or customer's needs. For example, these modules can be entrance traffic, customer-staff interactions or queues and wait times. The Pathr.ai stack was built with a privacy-first approach and runs locally at the edge, so no video data needs to be sent to be processed in the cloud - a critical factor for large enterprise retailers where data privacy and security are top of mind.

**3. Outbound Data Writer -** sends these analytics datasets to various endpoints, such as Tableau or Microsoft Power BI dashboards for historical data, and text messages or email for real-time alerts and notifications. Through these analytics, retailers can cost-effectively understand how their stores are performing by leveraging real-time analytics to increase growth including:

⚇ Entrance and group sizes for measuring true sales conversion rates

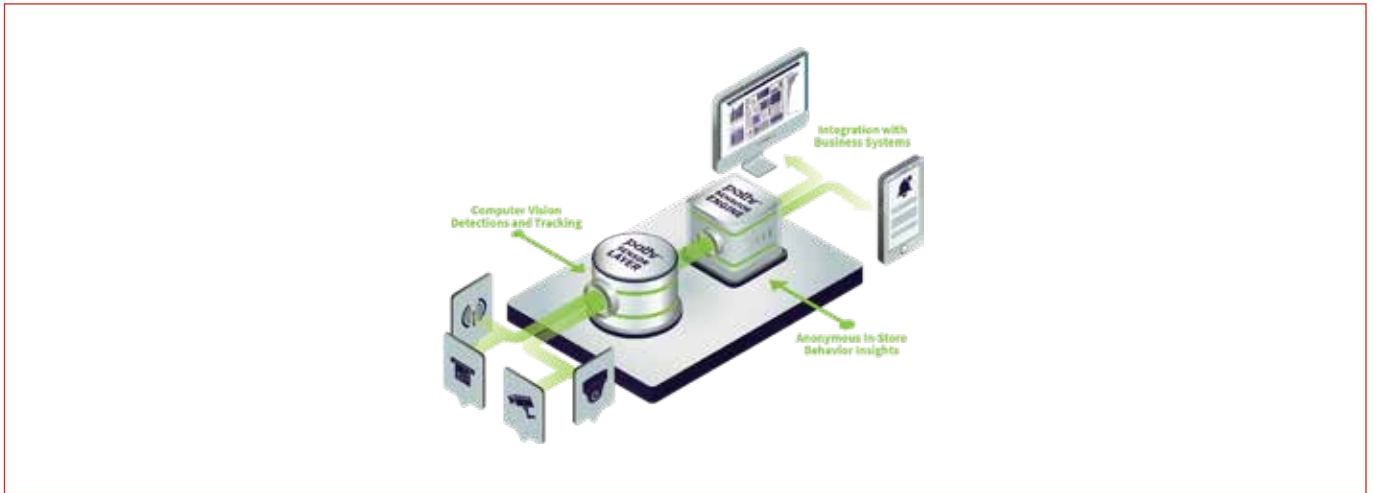⚇ Shopper behavior including traffic and dwell times

⚇ Staffing optimization via insights around customer and staff interactions

🕐 Checkout queue and wait times

⚠ Loss Prevention

# ⚛️ Design Components

| | Servers | CPU | Storage | Networking | Software |
|---|---|---|---|---|---|
| **Edge** | ThinkSystem SE450<br><br>Intel Xeon Gold 6338N 32C | 1 3rd Gen Intel® Xeon® Platinum processor, up to 36 cores, up to 225W TDP | 2x16G UDIMM<br><br>2x 1TB PCIe NVMe M.2 SSD | 1Gb NIC<br><br>TPM 2.0 | Ubuntu 20.04 pathr-edge |
| **[Dif. sizes]** | ThinkSystem SE350<br><br>Intel Xeon D-2166NT 12C | 1- Intel® Xeon® D-2100, up to 16 cores | M.2 800GB SATA SSD<br><br>2x M.2 480GB SATA SSD<br><br>2x16GB DDR4 2666 RDIMM | 1Gb NIC<br><br>TPM 2.0 | Ubuntu 20.04 pathr-edge |

## 📝 Summary

To remain competitive among online-only retailers, brick and mortar retailers now have a scalable and cost-effective solution to drive higher profits and lower operational costs for their physical stores. Pathr.ai's spatial intelligence solution, powered by Lenovo AI-ready, servers, allows retailers to leverage their existing camera infrastructure to collect analytics around customer and staff behavior inside their locations.

Running at the edge ensures that video data remains at the retailer's site and preserves the data sensitivity. Using Lenovo's edge server portfolio, Pathr.ai is able to scale its edge AI solution to thousands of retail customer locations worldwide.

## 🕸 Resources

- [Explore the Lenovo HPC and AI Innovation and Briefing Center](#)
- [Lenovo Validated Design for AI Infrastructure on ThinkSystem Servers](#)
- [Pathr.ai Analytics](#)
- [Pathr.ai Demo Reel](#)

## Intel® Xeon® Scalable Processor

With consistent, predictable performance, Intel® Xeon® Scalable processors give you fast, reliable processing across each of your AI environments. Intel's continued innovation brings to the cloud new integrated features, such as Intel® Deep Learning Boost (Intel® DL Boost) to accelerate performance for artificial intelligence workloads and reduce the need for custom accelerators like GPUs.

# 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.

To remain competitive among online-only retailers, brick and mortar retailers now have a scalable and cost-effective solution to drive higher profits and lower operational costs for their physical stores. Pathr.ai's spatial intelligence solution, powered by Lenovo AI-ready, Intel certified servers, allows retailers to leverage their existing camera infrastructure to collect analytics around customer and staff behavior inside their locations.

# Scaling on the Edge

Running at the edge ensures that video data remains at the retailer's site and preserves the data sensitivity. Using Lenovo's edge server portfolio with Intel CPUs, Pathr.ai is able to scale its edge AI solution to thousands of retail customer locations worldwide.