Optimizing Smart City Infrastructure with Lenovo and Intel®

Introduction

Today's cities face numerous challenges, from growing populations to effective resource utilization. This use case explores how Novalia, a bustling metropolis in Latin America with a population of 1.5 million residents, leveraged Lenovo ThinkEdge devices, powered by the latest Intel processors, to address key challenges in their transformation to a smart city

Novalia has deployed IoT devices, smart sensors, and AI-powered systems across various sectors, but effectively leveraging the large amounts of data produced from these devices to improve city functions has been difficult. By deploying the ThinkEdge SE50 client and the ThinkEdge SE450 server, Novalia achieved real-time data processing that enabled immediate and intelligent decision-making in areas such as traffic management, public safety, and energy usage.

ThinkEdge's scalability and versatility enabled Novalia to incrementally upgrade its technology infrastructure as physical infrastructure improvements to roads, traffic lights, and buildings were initiated. And the parallel processing power of the SE450's GPUs enabled Novalia to offload critical workloads and manage increasingly complex emergency response operations and energy management initiatives. This use case highlights how Lenovo edge computing solutions, powered by Intel technology, are ushering in a new era of smart city innovation for Novalia.

About Novalia

Novalia is a fast-growing city that is known for its thriving technology industry and its strategic riverside location.

- Novalia has a population of 1.5 million residents which is expected to grow to 2 million by 2035
- The city is situated along the River Noval and surrounded by a mix of urban and suburban developments
- In 2019, government leaders committed to transforming Novalia into a smart city
- Novalia is focused on improving several key sectors, including energy management, public safety and security, and transportation and mobility

Lenovo ThinkEdge

The Challenges of Novalia

Novalia's transition to a smart city has been complex, with challenges including outdated infrastructure, integrating AI and IoT across multiple sectors, and harnessing data for real-time decision-making.

Outdated Infrastructure

Novalia's aging infrastructure struggles to support the integration of new technologies such as IoT devices and AI-powered systems. Upgrading roads, utilities, and public services to handle advanced technologies has been both costly and complex.

Traffic Management

Novalia has experienced rapid population growth and increased vehicle usage, leading to significant congestion on outdated road networks. The implementation of smart traffic systems has been slow, hindered by the need to upgrade infrastructure and integrate real-time data from various sources.

Emergency Response

There have been delays in integrating smart technologies with traditional emergency systems, creating gaps in communication and coordination. Real-time data generated by IoT sensors and smart devices have been difficult for Novalia to effectively manage, hindering decision-making during critical incidents.

Public Safety

The complexities of integrating AI-driven surveillance and smart sensor systems across police, fire, and EMS, while ensuring that these technologies can interoperate seamlessly to quickly alert personnel on threats, has proven a significant challenge for Novalia.

Energy Management

Novalia wants to monitor and manage energy usage in real-time to increase efficiency and sustainability, while lowering costs. But harnessing data from sensors and IoT devices installed across the city and municipal buildings has been difficult without updated technology infrastructure.

Harnessing Smart City Technology with Edge Computing

ThinkEdge's ability to deliver real-time data processing with scalability is critical to managing a citywide network of interconnected systems. The compact size, AI-driven capabilities, and ability to operate in both government buildings and in cabinets on city streets with a temperature range of 0°C to 50°C made Lenovo's ThinkEdge SE50 client a perfect fit for efficiently managing Novalia's localized data from smart traffic lights, environmental sensors, and AI-powered cameras.

Novalia chose the ThinkEdge SE450 server for its high-performance processors and advanced memory capacity to enable larger-scale data processing at the edge, which was crucial for complex analytics and execution of critical applications across multiple city sectors, such as emergency response coordination and energy management.

As the city's population grows and its physical infrastructure is updated, ThinkEdge ensures that Novalia can easily scale their technology infrastructure up or down to accommodate new projects as well as enhancements to existing roads, bridges, and buildings. The ability to integrate diverse applications across multiple sectors, coupled with Lenovo and Intel's commitment to versatility and reliability, made ThinkEdge the ideal choice for creating Novalia's smart city of today – and tomorrow.

SE50

Intel® Core™
Powerful and reliable edge client server

SE450

Intel® Xeon® Platinum
Intel® Data Center GPU Flex Series
The most GPU-rich AI server for the edge

Transform Your Business with AI at the Edge.
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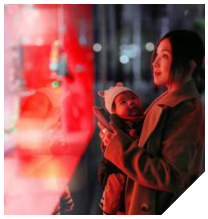
Realizing the City of Tomorrow with Lenovo ThinkEdge and Intel

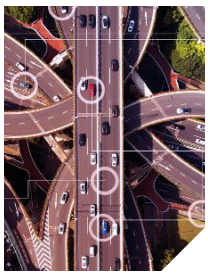


Modernized Infrastructure

By deploying ThinkEdge SE50 devices across the city and in buildings, Novalia began upgrading its technology infrastructure incrementally without needing to overhaul the entire physical infrastructure at the same time. This allowed for smoother integration of IoT devices and automation into the existing framework, improving efficiency and extending the lifespan of older systems.

Improved Public Safety

Novalia deployed ThinkEdge SE50 devices in cabinets throughout the city to power AI-surveillance cameras equipped with computer vision, enabling quicker responses to potential threats and improved crime prevention. Data compiled in the city's SaaS dashboard was harnessed by the SE50, allowing authorities to quickly identify and respond to potential criminal activities, accidents, and emergencies.



Smart Traffic Management

With the ThinkEdge SE50 devices powering sensors and cameras across Novalia, the city enabled adaptive signal control and smart crosswalks that respond to real-time conditions. This allowed traffic signals to be adjusted dynamically, reducing wait times for pedestrians while lowering the risk of jaywalking and preventing unnecessary traffic congestion. The SE50 also helped synchronize autonomous vehicle routes with traditional traffic patterns, ensuring smooth integration as Novalia modernizes its transportation infrastructure.

Streamlined Emergency Response

The ThinkEdge SE450 serves as the backbone for Novalia's emergency response systems, offering enhanced power and real-time data processing. By offloading data streams from video feeds, sensor inputs, GPS locations, and communication systems to the SE450's GPUs, emergency responses are coordinated more effectively thanks to the rapid processing of this data at the edge. And the parallel processing power of the SE450's GPUs enables greater scalability to manage increasingly complex operations, such as prioritizing ambulance and fire units or coordinating multiple agencies in the event of a natural disaster.

Efficient Energy Usage

In Novalia's efforts to modernize its energy infrastructure, the city deployed smart meters, sensors, and IoT devices on city streets and in buildings to track energy consumption. ThinkEdge SE450 servers processed data locally to optimize energy usage – immediately adjusting lighting and HVAC systems in government buildings based on occupancy, while automatically dimming and brightening smart streetlights based on the time of day. This helped reduce overall energy consumption and moved Novalia toward its goal of increased sustainability.

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Simplified Deployment and Provisioning with Lenovo and Intel's Global AI Innovation

Novalia strategically leveraged Lenovo and Intel's suite of software and services to streamline the deployment and management of the SE50 and SE450, while maximizing AI capabilities.

Lenovo's Open Cloud Automation (LOC-A) allowed Novalia to automate the provisioning and configuration of the SE50 and SE450 devices, significantly reducing the manual effort involved in edge deployments across city cabinets, smart meters, and buildings.

Lenovo's XClarity provided a unified platform for monitoring and managing the edge devices, giving Novalia's IT teams real-time visibility into system performance, health, and security. Through XClarity, the city easily deploys firmware updates, monitors energy usage across devices, and ensures that all systems are running optimally.

The **Intel®Tiber™ Edge Platform** provided advanced AI and machine learning capabilities at the edge, enabling Novalia to optimize real-time data processing for critical applications like traffic management, energy distribution, and public safety.

Lenovo's AI Innovators Program helped Novalia rapidly deploy AI-driven applications within their ThinkEdge infrastructure. They leveraged Intel's AI accelerators, including technologies like the **OpenVINO™** toolkit, to boost AI processing at the edge, enabling faster inference and deeper insights from the city's data, providing future-proof technology as the city grows.

intel® tiber™ Edge Platform

OpenVINO™

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