Edge Technologies Driving Smart Manufacturing

Solutions for rapidly processing and acting on data closer to the edge, with Lenovo ThinkCentre IoT Gateway, Klika Tech and AWS

Introduction

Klika Tech and Lenovo collaboratively developed an edge-to-cloud solution that enables manufacturers to improve operations by gathering and processing data at the edge. Leveraging Lenovo's ThinkCentre M90n Nano IoT Smart Edge device and AWS services, the solution relies on various IoT sensors for edge data collection, and the power of AWS IoT and Cloud for analysis, visualization and Machine Learning.

A custom Klika Tech Web dashboard gives users a way to remotely monitor, manage, and control operations. The ThinkCentre M90n-1 Nano IoT Gateway is at the core of the platform delivering powerful performance in an ultra-portable size (0.55L) and enabling data processing and device security at the edge.

Challenges

Intelligent manufacturing requires constant process monitoring, rapid discovery of anomalies and the ability to correctly determine how to respond. Within the vast amounts of data collected from edge devices are signals of deviations from normal functions, which could be minor equipment malfunctions or cyber intrusions. The ability to process data at the edge of operations paired with an edge-to-cloud system for data processing, analysis and visualization delivers a monitor and control approach for optimizing operations and avoiding costly equipment downtime.

Solution

An integration of Lenovo's ThinkCentre M90n Nano IoT Smart Edge device for edge data processing and machine control with AWS services including AWS IoT Core and AWS SageMaker for data storage, analysis, visualization, and Machine Learning. Custom firmware, software and a Web dashboard for monitor and control. Edge device sensors for monitoring temperature, accelerometer, current, humidity and more.

Features/Results

Simplified edge-to-cloud data collection and device governance. The ThinkCentre M90n Nano IoT supports WiFi, Bluetooth®, and 4G/LTE WWAN wireless connections for efficient data collection and delivery and governance of edge devices. Data can be processed at the edge for rapid anomaly discovery and automated response. Built on AWS to ensure safe, reliable transportation of data moving between floor level equipment and user dashboard for analysis, control and optimization.

- Reduced failures and downtime
- Expand devices and data with scale
- Predictive maintenance
- Increased and automated responsiveness
- Rapid relay of information between IoT peripherals, sensors and more connected devices
- Enhanced system visibility
- Anomaly threat detection