Lenovo and nybl AI maximize the efficiency of Oil & Gas Wells, responsibly

Nybl's Lift.ai, powered by Lenovo Edge technology, delivers intelligent insights within a cost-effective footprint

Overview

Oil & Gas companies across the globe need to maximize the efficiency of their wells, responsibly. They are balancing objectives like increasing production, capital efficiency, and mitigating risk to drive safe, efficient, profitable production. These challenges and objectives are exacerbated by the real-time nature of many of the high value digital services that industrial companies require. nybl's Lift.ai addresses these challenges with machine learning and highly efficient Lenovo Edge technology.

The Challenge

One of the main challenges for oil & gas companies is the volatility created by the oil market cyclicity and fluctuation. Irrespective of market conditions, organizations need to operate in the most efficient and sustainable way possible. Navigating the ebb and flow nature of the global commodity market means maximizing efficiency in every aspect of the value chain. Next to this external challenge Oil & gas companies have many internal valuable and sensitive assets running far away from civilization in often hot, dry and inhospitable places. The supervision of sites, due to distance and limited workforce bandwidth, is challenging and expensive. And the financial cost of an undetected leak can be significant. In addition to the product loss, companies can be subject to significant penalties, calculated from the time of last inspection to the time the leak is repaired.

Efficient performance of daily duties and tasks relies on the regular availability of production and operational data from wells in the field. However, large numbers of wells remain without communication infrastructure, disrupting the flow of highly valuable data to engineers in the office. This lack of communication results in significant lost opportunity, avoidable down-time, inefficient production and higher operational cost. These challenges are exacerbated by the real-time nature of the well data that today's Oil & Gas companies require.

The Solution

Lenovo, in partnership with nybl, offers a solution that enables remote well management and predicts oil well pump failure, increases lifespan of pumps and improves efficiency and productivity on the edge.

nybl's lift.ai is a system that provides artificial-lift failure prediction, management, and optimization. The system accomplishes this by applying Domain Knowledge (subject matter expertise) to Data Science to create "Subject Matter Expert machine learning models". This is done by first applying standard data analytics and data science analysis techniques to historical data to define failure parameters, and then applying subject matter expertise to identify the key features that allow the creation of real-time machine learning models to better understand and interpret the subject matter of the data being processed.

The solution provides operators with visibility to their artificial lift wells thereby enabling:

- Remote monitoring and control. extended connectivity to wells in remote locations using existing communication infrastructure
- Deployment of advanced AI/ML based solutions such as predictive analytics, optimization of well production and/or surface equipment, failure prediction etc.
- Operational optimization (maintenance by exception, reduced windshield time)

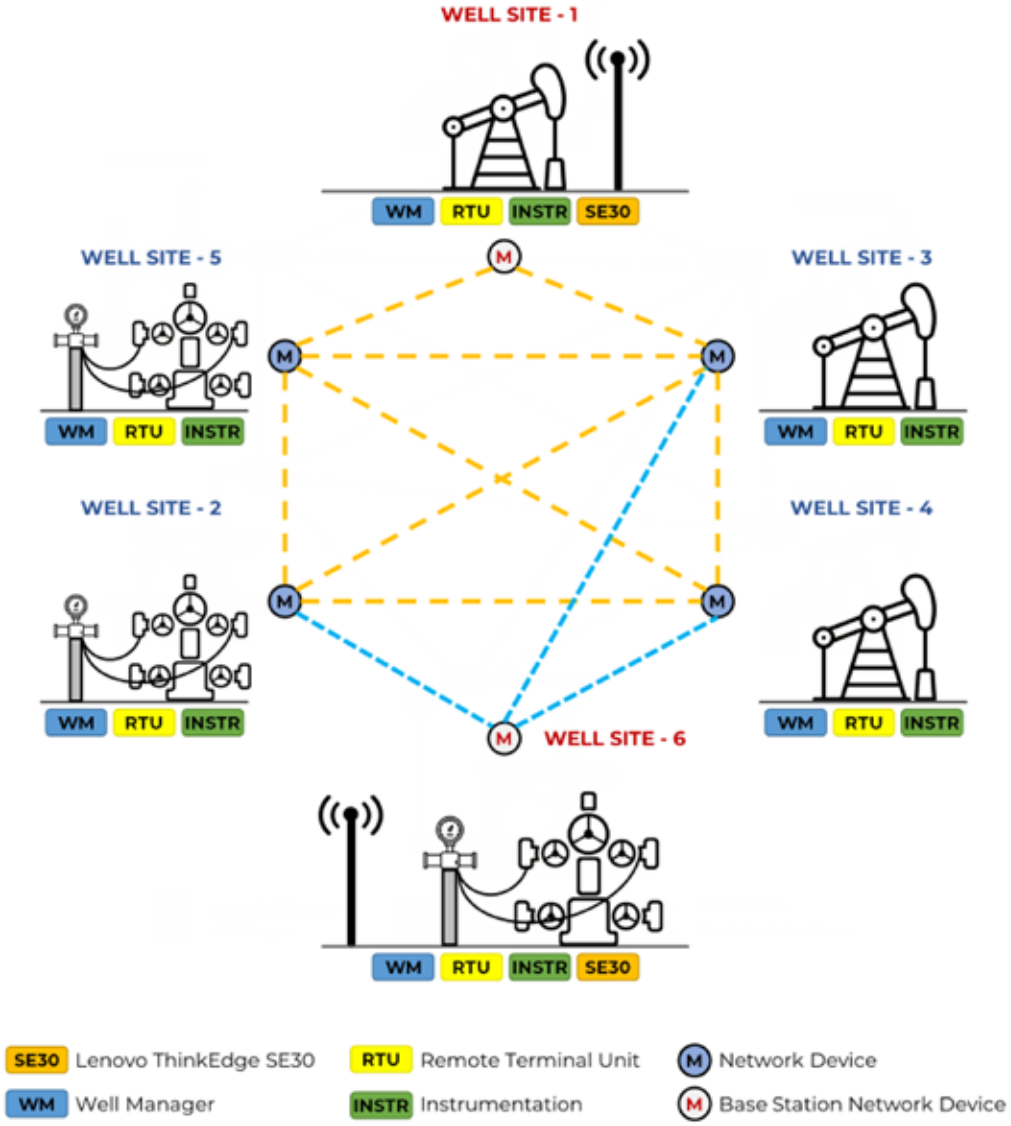
The Results

Lift.ai and Lenovo edge provide real-time intelligence that targets reducing operating costs, extending pump life through operating wells more efficiently, predicting imminent, non-trending failure phenomenon, and running efficient reservoir, energy and production management. These outcomes translated into value realization in the form of millions of dollars. Next to considerable financial, operational and efficiency gains, the solution also has a positive environmental impact. Just by reducing the windshield time (driving back and forth) we save approximately 1,381,578 gallons of gasoline and 12.278 metric tons of CO2 annually.

Validated Architecture

Servers	CPU	Software
Initial testing on Lenovo ThinkEdge SE30	Intel® Core™ i5-1145GRE processor	lift.ai, anything.ai (synapse module)
Also available on SE50, SE350, and SE450 Servers	Intel® Core™ Intel® Xeon® D processors Intel® Xeon® Scalable processors	lift.ai, anything.ai (synapse module)

Built on nybl's comprehensive anything.ai platform, lift.ai carries out data acquisition from the field/surface equipment. This data is marshaled into the Lenovo ThinkEdge Servers running the lift.ai's synapse module. From here, the data is sequenced and transmitted back to the control room servers where it is fed into lift.ai for User access. The deployment of the edge server allows for standalone operation in case of communication failure.



Resources

- Explore the Lenovo HPC and AI Innovation and Briefing Center
- Lenovo Validated Design for AI Infrastructure on ThinkSystem Servers

Why Lenovo

Focused on a bold vision to deliver smarter technology for all, Lenovo is developing world-changing technologies that create a more inclusion, 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. Lenovo ThinkEdge servers are built to survive the extreme environments required to operate on the edge in the Oil & Gas industry.

Why Intel

Intel CPUs are flexible processors designed to handle AI workloads. Intel® Core™ processors are ideal for AI at the Edge, enabling AI for local cameras, robots, drones, field equipment, and other edge devices with technology tuned for low-latency inference. Since most ThinkEdge systems are Intel vPro™ platforms, they include Intel® Active Management Technology with support for remote management over Wi-Fi and over the cloud. With a range of AI capable processors supporting deployments from data canters to the edge, Intel Xeon processors are the foundation for deep learning inferencing with AI enhanced capabilities (e.g., Intel® Deep Learning Boost, Intel® AVX 512) integrated in the silicon. The Intel® Distribution OpenVINO™ provides best-in-class performance on a wide range of Intel processors, as well as other hardware platforms.

Why nybl

nybl's mission is to democratize AI, which is no simple feat and is often met with skepticism. AI has barriers, both skill and technical. Skill barriers include knowing how to write software code and knowledge of mathematics. Technical barriers stem from having to understand data science and data analytics. nybl delivers smarter AI: a knowledge-driven machine learning platform that turns mountains of underutilized data into actionable intelligence.as other hardware platforms.

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