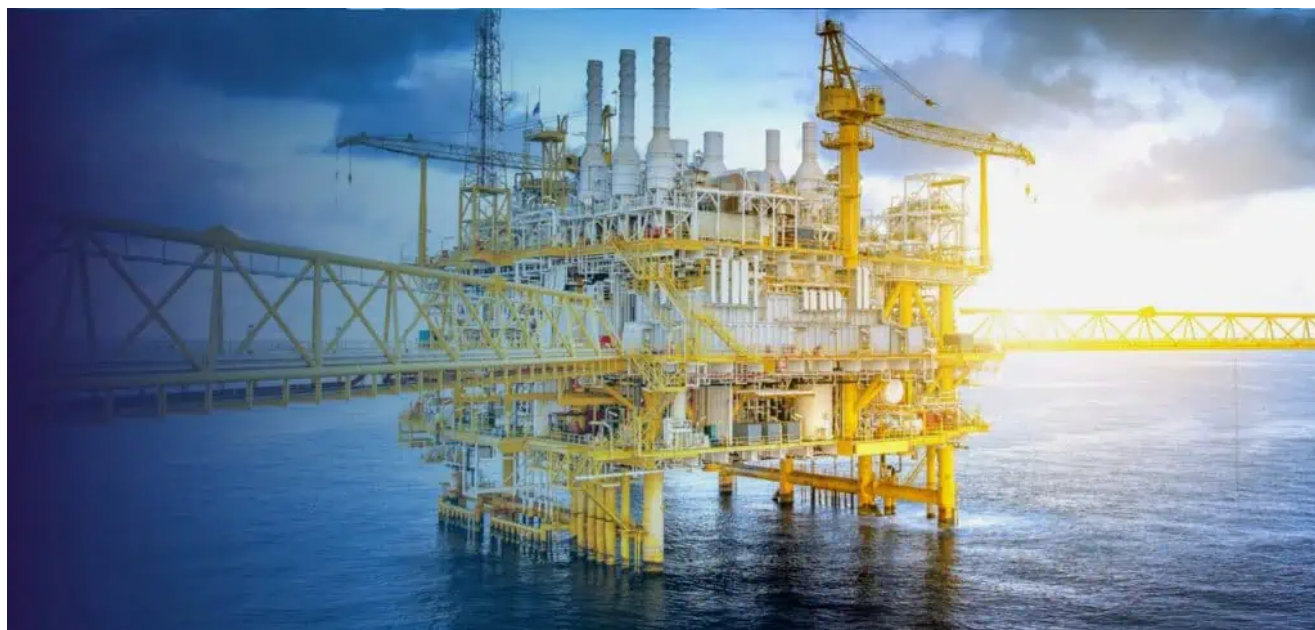# Advancing the Oil and Gas Industry with 5G and Edge Computing

netrality.com/blog/how-the-oil-and-gas-industry-is-sliding-into-technological-advancements-powered-by-5g-and-edge-computing

Articles & Blogs

How the Oil and Gas Industry is Sliding into Technological Advancements Powered by 5G and Edge Computing

The role of the edge and 5G are vital in the oil and gas industry. Edge computing brings applications closer to data sources like the Internet of Things (IoT) devices and sensors or local edge servers to end-users, significantly reducing latency while increasing capacity and reliability. Edge computing is a vital component of a company's IT infrastructure.

An oil and gas company is a business entity engaging in the exploration, production, refinement, and distribution of oil and gas. An integrated oil and gas company divides its operations into three components: upstream, midstream, and downstream. Upstream includes exploration and production, midstream covers transportation and storage, and downstream focuses on refinement and marketing.

The role of the edge and 5G are vital in the oil and gas industry. Edge computing brings applications closer to data sources like the Internet of Things (IoT) devices and sensors or local edge servers to end-users, significantly reducing latency while increasing capacity and

reliability. Edge computing is a vital component of a company's IT infrastructure. By 2025, Gartner predicts that 75% of enterprise-generated data will be created and processed outside centralized data centers.

5G requires unprecedented rapid data transmission, which is achieved when organizations shift to the network edge to enable 5G-level applications and services. 5G technology delivers speed, ultra-low latency, increased bandwidth, and reliability.

The oil and gas industry is at the forefront of the physical world's edge regarding the operating environment. It has wellbores thousands of feet underground, millions of miles of pipelines, unpredictable sea conditions and winds, extreme temperatures, complex refining processes, and many configurations in terminals.

The distributed environments in the past have caused delays, silos of information, and reactive operations. **The edge is the change in the paradigm.** The oil and gas industry generates massive amounts of data, and this will only increase with the proliferation of sensors. The industry's challenge is extracting actionable business insights from this data, enabling procedures to run more efficiently. Communication between oil rigs and control centers is critical for reliable, secure, and resilient networks to provide real-time updates.

In 2021, the oil and gas market was over $620 billion and is expected to grow to more than $1,117 billion between 2022 to 2030. Let's look at a few use cases in the industry.

Artificial Intelligence (AI)

AI-powered robots detect oil seeps and natural leaks of crude oil, either a gas or liquid, that comes up through the earth's surface. This information is used to create customized drilling strategies for each area to ascertain challenges and risks. AI can detect pipeline corrosion and evaluate equipment usage.

Machine Learning (ML)

ML is a subset of AI that analyzes substantial amounts of data quickly. Once the data is reviewed, geological models are created to evaluate and predict dig sites to optimize the exploration and drilling process. This information is recorded and used to predict the geology in similar regions, saving the industry time and money.

Predictive Maintenance

3 out of 4 organizations take either a time-based or reactive approach to maintenance. While less than 1/4 of companies in the oil and gas industry report their maintenance strategy as predictive – focused on data or analytics. Updating maintenance practices to more predictive efforts driven by digital technologies and data-based optimization enables offshore production facilities to reduce unplanned downtime and drive efficiencies.

Regularly inspecting assets provides day-to-day operational insights to help maintain the health of your operations. IoT devices and sensors predict when systems need to be repaired or replaced, preventing unscheduled downtime – increasing employee safety and productivity. According to Senseye's report, "The True Cost of Downtime," one hour of unplanned downtime costs the oil and gas industry $220,000. Algorithms are utilized to analyze big data and schedule maintenance when needed. IoT devices, sensors, drones, and robots gather and send real-time data from those working in the field to office locations. IoT deployments reduce energy usage and emissions while allowing companies to control the production process remotely. Sensors monitor pressure, gas flow, and temperature to predict leaks and prevent other dangers. Real-time tracking of shipments is essential for precise and accurate communication between supply chain partners.

The substantial amounts of data generated in the industry via these technological advancements enable the oil and gas industry to increase efficiency, calculate optimal drilling sites, improve functionality associated with machinery, increase production, decrease unplanned downtime, and increase the safety of workers.

For businesses to maximize operations and improve performance, edge computing is a critical requirement. You need a solid infrastructure in fiber-connected, urban-situated colocation facilities at the edge to get you closest to your users to enable interconnection that combines high-performance networks with physical proximity.

Takeaway

5G enhances edge computing in the oil and gas industry. It provides real-time tracking of worksite safety conditions in mines, activity monitoring to increase human productivity within oil rigs, tracks the condition of equipment to improve maintenance, uses artificial intelligence to improve operational efficiency, and protects worker health and safety. The utilization of AI calculates the optimal flow of oil to ensure reliable production and enforce long-term pipeline health. Additionally, 5G with the edge allows operation teams to find the best routes to transfer oil to refineries and fuel stations.

Netrality delivers best-in-class interconnection and colocation services through its operator-owned buildings, featuring cloud-neutral Meet Me Rooms with a robust ecosystem of providers delivering ultra-low latency, high performance, scalability, and network reliability.

Contact us today to learn more about our strategically located data centers!

Related To This Article

Articles & Blogs