Transform Oil and Gas with an Intelligent Edge and IoT

DESIGNED FOR THE OIL AND GAS INDUSTRY

Upstream Increase productivity and efficiency, and reduce drilling issues. Optimize extraction with reduced overall costs.

Midstream Quickly uncover pipeline issues and reduce downtime. Increase intelligence and aggregate data from SCADA systems.

Downstream Accelerate improved customer interactions with collecting preference and purchasing data across gas stations.

FOR OPERATORS/DEVELOPERS

Operator support is built-in which consolidates infrastructure sprawl and eliminates application silos. Operators can easily manage planet-scale operations with zero-touch onboarding.

Developers have the flexibility to bring their own machine learning models, and access rich data/runtime services to execute AI at the edge. Developers can also leverage rich APIs and integrate into existing CI/CD pipelines for easy debugging.

The oil and gas industry is constantly challenged with the rising costs of exploration, drilling, extraction, market conditions, and margin pressures. It is essential for energy companies to look for technologies that can help reduce exploration budgets, including at the edge of their operations where devices and sensors reside.

Applications and functions in support of exploration, seismic interpretation, visualization, and drilling have also undergone transformation, especially with the adoption of Internet of Things (IoT). According to Gartner, by 2022, more than 50% of IoT projects will utilize edge devices for analytics.[1] Traditional IT architectures including compute and storage will suffer when scaling, simplifying, and adjusting to new demands, resulting in increased application latencies.

COMPUTING AT THE EDGE

In order to optimize operational responsiveness and maximize savings, processing sensor and device data closer to the source must be a priority for organizations. In order to maximize equipment utilization field workers must react in real-time to conditions at the oil well. With the right edge and IoT platform, expensive bandwidth requirements associated with centralized deployments can instead be handled locally with minimal resources.

OIL RIGS

Ephemeral data for local drilling operations in disconnected mode

Previously, an edge cloud—with local appliances connected to sensors—was difficult to operationalize due to diversity of sensors, which communicate via protocols like Modbus, CAN bus, PROFINET, and MQTT, and require different physical interfaces. The scale of deployment—involving hundreds of depots and thousands of oil rigs—makes it even more challenging. Moreover, the next-gen cloud native apps require new constructs and various machine learning (ML) frameworks. Applications need to be able to run on a range of devices with various types of CPU – and with various types of GPU, ASICs, FPGAs, add-on cards from various vendors. On top of this, the human element of IT—operational technologies, developers and data scientists—all need to come together to operate the IoT application.

[1] https://www.gartner.com/document/3877186?ref=TypeAheadSearch&qid=ece97d1bd3a148df1faaaef53

NUTANIX™

Xi IoT HIGHLIGHTS:

Process Large Data Volumes: Utilize machine learning to intelligently process IoT sensors/ devices data

Increase Reliability: Continuous operations with unreliable low bandwidth links

Reduce Latency: Fast response at the edge

Secure Connections: End-to-end security from the edge to the cloud

Liberty to Select Sensors/ Devices: Connect any sensors or devices using multiple protocols, MQTT, or IP-based systems.

BUILD INTELLIGENT EDGE PLATFORMS AT SCALE

The Nutanix Xi IoT platform delivers local compute and ML for IoT edge devices used in exploration, converging the edge and cloud into one seamless, delightful application platform to solve these challenges. The platform eliminates complexity, accelerates deployments and elevates developers to focus on business logic powering IoT applications and services. Now developers can use low-code development platforms to create application software via graphical user interfaces versus traditional programming methods.

Centralized Development for Massively Scalable Infrastructure

Make edge infrastructure invisible by enabling seamless functionality and deployments across all IoT stakeholders including end users, IT operators, IT developers, and data scientists.

Insights from Data at Low-code

Compute sensor data streams locally in real-time with open dataflows & services, while allowing filtered & transformed data to flow securely to Amazon Web Services (AWS) using native services. The edge PaaS (Platform-as-a-Service) supports easy-to-use developer APIs, reusable datastreams, and pluggable ML architecture to enable rapid development and global deployment of modern IoT applications. Xi IoT allows multiple frameworks to be built into the runtime enabling custom runtime environments, and ML models can be brought in from anywhere.

Convergence of Edge and Cloud

Seamlessly move data between edge devices and AWS. Leverage the freedom of choice across your own on-premises infrastructure or AWS.

Xi IoT differs from traditional proxy gateway solutions because it:

- Provides real-time data processing at the edge for real-time, actionable insights
- Offers no-code ways to migrate filtered insights to your choice of clouds
- Allows you to easily configure, set up, and manage thousands of edge locations from a centralized software control plane

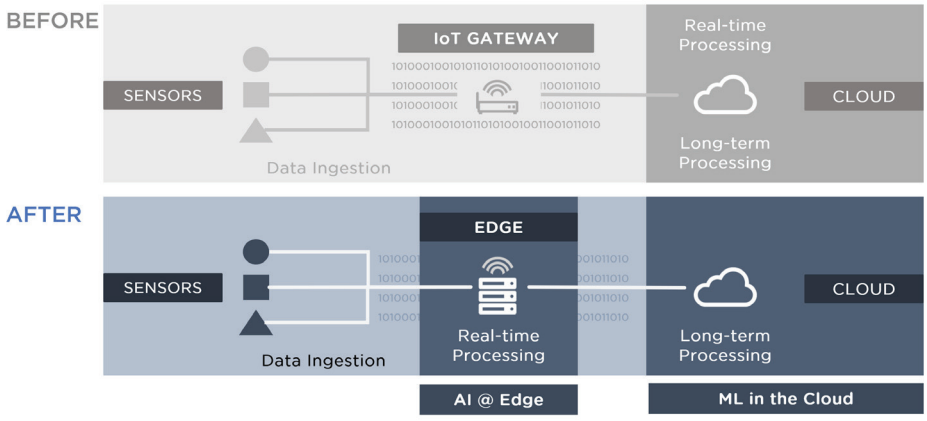

Figure: The IoT Gateway is transformed to an intelligence Edge device capable of local real-time processing (edge PaaS)

Xi IoT AND EDGE ARCHITECTURE

Nutanix Xi IoT is comprised of a software control plane and Xi Edge platform running on an edge device. The software control plane provides an end-to-end platform that is centrally managed from the cloud through a user-friendly interface for application development and operations to easily deploy thousands of edge locations. Using Xi IoT, Nutanix customers can either deploy Xi Edge bare metal or as virtual machine (VM) on shared or dedicated nodes.

The Xi Edge platform leverages Kubernetes, which allows you to consolidate traditional IoT applications as well as enable new-generation, data science-based applications in containers.

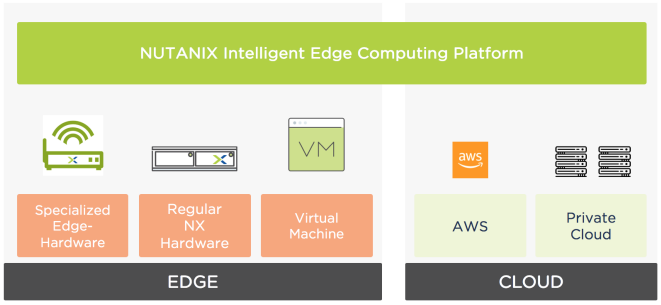

Figure: Simplified edge computing with built-in cloud connectors

The Xi Edge platform provides secure access to IoT data sources with data pipelines all the way from the edge to the cloud. The platform allows use of AWS and managed/on-prem private clouds, and allows seamless data mobility between edge and cloud, to send metadata and build ML models in the cloud. Now developers can utilize edge PaaS frameworks to create building blocks to be leveraged across applications.

Figure: Deploy edge resources with ease

Transforming Oil and Gas

Nutanix Xi IoT can help oil and gas organizations transform upstream and downstream operations. The platform enables easy ingest and analysis of new and existing data streams. And, the PaaS architecture enables focus on business logic and applications/functions, such as offering real-time analysis of a well site or analytics at a retail locations. The business benefits can range from optimizing extraction to maximize retail revenue and identify trends long before the competition.

Nutanix is committed to helping oil and gas companies modernize their datacenters so they can shift their focus from maintaining infrastructure to innovating in their businesses. Schedule a customized technical briefing on Nutanix Xi IoT platform by connecting with your Nutanix representative or emailing **iot@nutanix.com**. Check out **www.nutanix.com/iot** for additional details.

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Nutanix makes infrastructure invisible, elevating IT to focus on the applications and services that power their business. The Nutanix platform leverages web-scale engineering and consumer-grade design to natively converge compute, virtualization and storage into a resilient, software-defined solution with rich machine intelligence. The result is predictable performance, cloud-like infrastructure consumption, robust security, and seamless application mobility for a broad range of enterprise applications. Learn more at www.nutanix.com or follow us on Twitter @nutanix.