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# A repeatable model for industrial data intelligence

## Overview

Applicable Industries



Energy

Applicable Functions



Other



Maintenance

Challenge

Exara's oil and gas client required a reliable way to gather, store, and process data from sophisticated machine assets in remote oil field sites. These harsh, real world environments present significant challenges for high performance computing devices.

Solution

The company anchored a robust data gathering and management infrastructure on Dell Edge Gateway devices for IoT, which are designed to perform well in difficult environments.

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Data Collected Data is transmitted to Petroflow offices through cellular connections in two types of workloads: machine data from scheduled polling and data needed by users for specific data management or analytical purposes.

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Solution Type IOT


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Solution Maturity Mature (technology has been on the market for > 5 years)


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## Operational Impact


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 Impact #1 Cuts power use by 43 percent and achieves \$60,000 in annual savings per site

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 Impact #2 Reduces maintenance costs and lengthens the lifespan of machinery


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 Impact #3 Creates transferable, scalable engagement model for oil and gas clients

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## Quantitative Benefit

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 Benefit #1 Cuts power use by 43 percent and achieves \$60,000 in annual savings per site

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# A repeatable model for industrial data intelligence

Exara boosts the lifecycle value of equipment by enabling information based digital optimization solutions that reduce operating costs, decrease non-scheduled maintenance, and increase productivity



## Customer profile



Company	Exara
Industry	Technology
Country	United States
Website	<a href="http://www.exara.net">www.exara.net</a>

## Business need

Exara's oil and gas client required a reliable way to gather, store, and process data from sophisticated machine assets in remote oil field sites. These harsh, real world environments present significant challenges for high performance computing devices.

## Solution

The company anchored a robust data gathering and management infrastructure on Dell Edge Gateway devices for IoT, which are designed to perform well in difficult environments.

## Benefits

- Creates transferable, scalable engagement model for oil and gas clients
- Reduces maintenance costs and lengthens the lifespan of machinery
- Cuts power use by 43 percent and achieves \$60,000 in annual savings per site
- Enables partners with hardware certification
- Delivers optimal performance for workloads in demanding conditions

## Solutions at a glance

- **Internet of Things.**

"Any of the more demanding environments would suggest the use of the Dell Edge Gateway 5100. It's currently the only reference architecture that meets our requirements and that we officially support for deployment in oil and gas fields."

*Brian Murphy, CEO, Exara*

In an innovative approach to field-based intelligence, Exara helps industrial companies gather data at the edge of their networks and make it available for processing and analysis. For Exara's customers, that means furnishing machinery, equipment and other industrial assets with sensors connected to the Industrial Internet of Things (IIoT). Intelligent gateway devices, an essential component of the infrastructure, receive, analyze, and prepare the data for relay on demand with precisely the fidelity required and no more.

"Across the oil and gas industry, we're already in discussions with companies of a similar scale as Petroflow and with larger ones too, and now we are beginning to approach the leading enterprises."

*Brian Murphy, CEO, Exara*

Running on these gateways, Exara Chronicle software connects high-fidelity IIoT machine data from industrial assets with the decision makers who need to take action. Although Exara software and services can serve a wide spectrum of industries, most current customers are U.S. oil and gas companies. Chronicle captures data from IIoT-connected industrial assets with the highest possible output frequency, without any loss of fidelity. It eliminates gaps caused by communication outages and minimizes bandwidth usage by optimizing, filtering and packaging data before transferring it. Considering that customers' machinery and equipment often exist in harsh, environmentally challenging conditions, the requirements are steep for the hardware infrastructure to support these data operations.

#### Changing course in midstream

In the Oklahoma operations of Petroflow, an independent exploration and production company specializing in locating untapped reserves in older oil fields, Exara used Advantech gateways to receive the data from sensors on the equipment at production stations and transfer wells. It soon became clear that those devices could not deliver the quality and performance Exara sought. Eric Kraemer, CTO and founder of Exara, notes, "In our early deployments with off-the-shelf IoT gateways we encountered numerous issues, some even requiring motherboard rework. We went through four revisions of the firmware with one product to get to a stable release. The devices simply were

not built for the industrial scenarios we support."

These concerns called for quick action. In the middle of a proof-of-concept project, Exara replaced its Advantech gateways with two Dell Edge Gateway Model 5100 devices.

#### Realizing the advantages of the OEM model

In Exara's view, some of the quality issues it experienced are associated with the original design manufacturing (ODM) business, where companies design and manufacture products that can be rebranded by other companies. Original equipment manufacturers (OEMs), on the other hand, perform research and development, license their intellectual property to a manufacturer and sell the products under their own brand. Brian Murphy, CEO at Exara, says, "These quality problems are typical of ODM devices. In contrast, Dell, like other OEMs, does a good job of testing and validating its equipment and design. The dramatic difference in quality was much what I would have expected from an OEM delivery chain compared to devices coming directly from an ODM." Mr. Kraemer adds, "At Petroflow, after close to 90 days with the Dell Edge Gateway 5100, we have had no device issues."

#### Products & Services

##### Hardware

Dell Edge Gateway Model 5100

### A gateway for demanding industrial applications

The Exara team promptly picked up on the purpose-built design of the Gateway 5100. "When we first received a preview of the Dell Gateway 5100, it was an exciting moment for us because it obviously is designed for the requirements of our customers' industrial environments," says Mr. Murphy. At Petroflow, the first two Dell Edge Gateway 5100 devices, one at a water disposal site and another at a production well pad, run on Wind River Linux 3.0. Data is transmitted to Petroflow offices through cellular connections in two types of workloads: machine data from scheduled polling and data needed by users for specific data management or analytical purposes. "In our Chronicle software, we support up to 64 concurrent connections for user data inquiries," Mr. Kraemer explains. "In addition, on a single Gateway 5100, we can aggregate hundreds of sensors at very high polling rates — much higher than you would see in a traditional telemetry application. What's more, we can buffer at least five years' worth of data on a Gateway 5100 in the field."

### Reducing power consumption by 43 percent

Exara and Petroflow established key performance indicators for the industrial assets whose data is captured by the Gateway 5100 devices, and they pursued them in several pilot projects. Mr. Murphy explains, "All the equipment operates on electrical power, which is the single most expensive component of oil field operations. The first KPI therefore was power consumption of the horizontal pumps and lifts on the disposal site. We reduced power consumption by 43 percent with the Dell Edge Gateway 5100. For our client, this means a cost savings of close to \$60,000 per site, per year." Petroflow wholeheartedly supported the change to the Dell Gateway 5100. Kim Booth, VP of operations and business development at Petroflow, says, "With all the technology that we have tried, this is the first time

that we have had total access to, and control of, all the data from our field. The cost savings speak for themselves, and this was only a 60-day review related to a small portion of our total asset base."

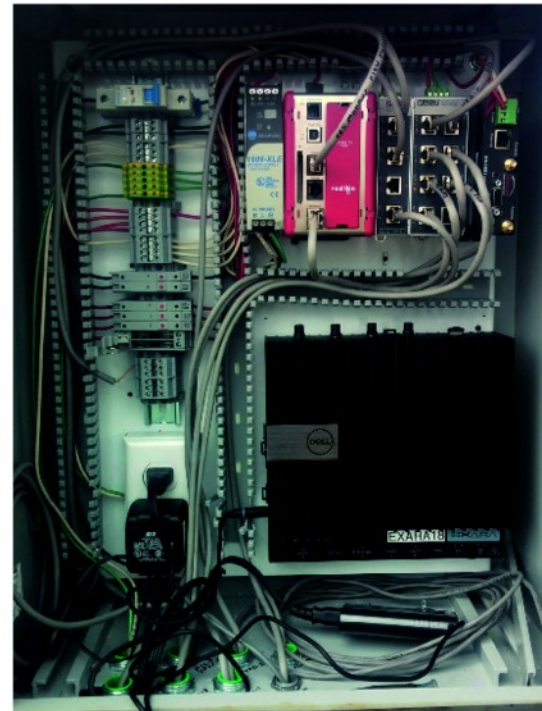
### Creating more value from industrial assets and maintenance

In subsequent pilot projects, Petroflow and Exara set KPIs that measure reductions in the cost of equipment maintenance and extensions of the life of industrial assets in the oil field. Says Mr. Kraemer, "Our client is happy that we are no longer dispatching people to sites in hazardous environments as frequently as before to maintain the data gateways. We deliver on our promise to help our clients realize their KPIs, which Dell has enabled us to do. We now consider follow-on production scenarios for new applications, such as optimizing maintenance and production. Petroflow has already decided to include eight more production wells and five more transfer stations in the program."

### An exclusive hardware certification to reassure partners

Because Exara delivery partners rely on the company's guidance in choosing hardware for their clients, Exara offers certifications. "We certify and recommend devices for specific use cases that involve our software," says Mr. Murphy. "Any of the more demanding environments would suggest the use of the Dell Edge Gateway 5100. It's currently the only reference architecture that meets our requirements and that we officially support for deployment in oil and gas fields."

Using the Dell Edge Gateway 5100 with its fan-less, solid-state design, Exara found several features that make the device a great fit for the harsh environments in oil fields, with their often extreme swings in temperatures and atmospheric values. Mr. Kraemer explains, "In the enclosure where the Gateway 5100 is located, temperatures may rise to above 100 degrees



Fahrenheit for hours at a time. One great thing about the gateway is that it has an appropriately designed heat discharge mechanism. It effectively sheds internal heat through radiation, which the previous device could not do. Dell partly accomplishes this through the design of the contact points between the external enclosure and certain internal components. That feature alone makes a huge difference for us.”

#### Accelerating performance with the right storage format

When it comes to performance and the effective operation of Exara Chronicle software, the design of the data storage technology in the Gateway 5100 plays a critical role. The Gateway 5100 uses solid-state disk storage modules with the M.2 specification. They are significantly smaller and faster than older formats such as the 2.5-inch SSD. “The storage performance is a big deal for us because we perform enterprise cloud data management at volume without a rack-mounted storage array to help its input, and therefore we have to get everything we can out of solid-state storage,” says Mr. Kraemer. “The more efficient solid-state storage is, the more efficiently our software can run. The performance of the Gateway 5100 with M.2 storage surpasses the traditional SSD format.”

#### Building on a blueprint for larger engagements

With 60 wells in six oil fields, Petroflow is a relatively small company in its industry. However, one of Exara’s objectives was to address this client’s concerns effectively before pursuing larger enterprises. The use of the Gateway 5100 in the Petroflow projects helped Exara set the precedent to make this possible. “One reason we chose Petroflow for these projects was because what they encounter in their production environment is the same

as what midsize and Tier 1 oil and gas companies face,” notes Mr. Kraemer. “They all experience the same issues in trying to optimize the equipment to improve operating performance. What also prompted us to connect with Petroflow is that it is extremely savvy when it comes to working with data.”

Following its success at Petroflow, Exara is partnering with consultancies and OEMs that serve the same industries. Mr. Murphy says, “We are building a pipeline of oil and gas customers with the very large oil and gas practice of Accenture with Dell and with Intel as well. Across the oil and gas industry, we’re already in discussions with companies of a similar scale to Petroflow and with larger ones too, and now we are beginning to approach the leading enterprises. We see our model as transferable to all the different operators in oil and gas, and we will follow a similar blueprint as we engage with other industries.”

#### Serving clients through an industry partnership

For Exara, it also makes a difference to have found in Dell a partner that shares its interests and makes resources available. “Dell offers a good, interactive partner program that we can take advantage of, and we have already engaged with several other partners to explore joint deployment and sales opportunities,” says Mr. Murphy. “The ability to provide feedback, to know that it’s being taken seriously, and to work closely with Dell development teams all matters greatly to us. We really appreciate that Dell’s focus is similar to ours. Instead of building generic devices, Dell decided to serve the industrial market. That aligns with how we do business.”

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*Eric Kraemer, CTO and Founder, Exara*

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