TTTech industrial

Simplifying predictive maintenance

for gas compressors with smart manufacturing solutions

intel MARKET READY

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Our customer is active throughout the world in the oil, gas, automotive, and process industries, as well as in the area of safety solutions. ↘

Challenge

The customer wanted to implement a predictive maintenance solution to better plan maintenance efforts and to detect wear or faults early. For gathering the data for this solution, an industrial IoT platform is needed. It must be able to accommodate high data rates, the management of diverse configurations, as well as local and offline operation.

The compressors all use the same devices to gather data, but these devices are configured differently depending on the type of compressor. The information needed to configure the predictive maintenance system is neither fully available on-site nor at the factory. A combination of on-premises configuration and individual factory configuration is necessary for an efficient rollout. On top of that, many installations are air-gapped for security reasons. Access to a cloud system through the Internet is often not permitted by customers. This means that the commissioning in remote locations must be possible even without Internet connectivity. Also, visualization cannot rely on cloud systems, but must happen on-premises.

Solution

For this customer use case, the Nerve edge computing platform was installed on an industrial PC from MOXA with an Intel Core I7 processor, certified for operation in hazardous environments. The excellent real-time performance of the system enabled sampling of signals at 50 kHz.

Nerve includes Nerve DNA ("Declarative Node Automation"), a built-in, intelligent configuration system which permits multi-tiered templating for all configurations in a declarative manner. It is easy to use and especially easy to automate through APIs. A Nerve DNA file is a configuration file for an edge device in human readable YAML format. It contains all possible configurations of a "Nerve Device" (i.e. an edge device on which Nerve is running) and for the applications installed on it.

This Nerve DNA file can be modified by the user through a templating system that enables the definition of a functional template which is valid for many nodes, and then to individualize this template for specific nodes to adapt them to their installation. Examples for such individualization are local network settings and software versions, but also the list of functions installed on the node and their configurations, such as the number of pressure sensors to be read by the system. Through this approach, the Nerve DNA system enables scaled rollout of diverse edge devices.

In Nerve, the edge device itself is the single authoritative source of the current and correct configuration. This property, in combination with an easy-to-use management interface at the edge device enables modification of the declarative configuration file DNA on premises, after installation, and even in air-gapped systems. The system will synchronize all configuration data when it comes back online after having been disconnected. Full offline operation is also possible.

Key Benefits

Nerve DNA provides an easy-to-use method to configure a multitude of edge devices and it provides the features to do this for online and for offline nodes. This means the customer does not need to design a complex configuration system for their predictive maintenance solution. Instead, the customer can focus on his core know-how in creating the best predictive maintenance algorithms, while configuration and operation at scale are provided by the Nerve edge computing solution.

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