

An oil company gains near-real-time control over 30,000 sensors

IBM WebSphere MQ Telemetry software helps ease the operation of 11,000 miles of pipeline

Overview

The need

Operating 11,000 miles of pipeline through harsh, inaccessible terrain presents formidable challenges. To protect the environment, this oil company must be able to detect potential failures quickly.

The solution

The business engaged IBM to expand the use of its existing IBM® WebSphere® MQ Telemetry software, which has delivered 99.999 percent reliability for more than 10 years while monitoring 33,000 sensors.

The benefit

The organization achieved greater integration among systems and improved the availability of near-real-time data to systems, leading to faster response times to potential safety issues.

This oil company operates more than 11,000 miles of pipeline in the United States. It transports raw and finished petroleum products, including crude oil, propane and refined products such as gasoline, diesel and jet fuel. The organization also stores motor fuels at terminals, where tanker trucks pick them up for delivery to local retail outlets.

A history of success with IBM software

This business relies on a complex messaging system based on two primary applications to monitor its fuel pipelines. The messaging system, which a private, satellite-based TCP/IP network supports, helps ensure that all the company's fuel grades can flow in parallel through the same pipelines. IBM WebSphere MQ Telemetry software has been a part of the organization's mission-critical systems for approximately 10 years, providing 99.999 percent system availability in production.

The first application in the messaging system is a dynamic, real-time supervisory control and data acquisition (SCADA) application that gathers data from more than 550 sites. Using a front-end publisher from IBM Business Partner Arcom (now part of IBM Business Partner Eurotech Ltd.), the organization telemeters in excess of 116 messages per second or 417,966 messages per hour to approximately 30,000 SCADA points. Status changes are event-driven and generally have a system latency of less than five seconds. The company then uses other messages to send outbound control commands and verify the health of the field equipment. These SCADA messages use WebSphere MQ Telemetry software to transport telemetry data and publish control commands.



The second application in the messaging system handles measurement transactions from metering systems in the field, uploading this information to an Oracle database that supports inventory management. WebSphere MQ Telemetry software delivers these transactions to an Oracle stored procedure that transforms and posts the data to the database. The system moves approximately 160 bytes at a rate of 6.25 messages per minute or 375 messages per hour.

Expanding IBM WebSphere software use

When IBM Business Partner Eurotech Ltd. acquired Arcom, Eurotech changed the licensing costs for the front-end publisher the pipeline company used for its messaging system. The cost for continuing to use that application on four servers increased, so the company sought a more cost-effective solution.

The organization initially implemented a broker architecture “electronic ticketing” system for the pipeline information, but this system did not sufficiently scale. Ultimately, the organization decided to move all of its communications to the WebSphere MQ Telemetry software.

By expanding its use of the WebSphere software, the company hoped to achieve numerous goals, including consolidating all of its Eurotech FEP use onto two servers, relocating its disaster center and replacing the telemetry servers used on its leased pipelines. To take advantage of security enhancements and additional process management features, the organization also decided to upgrade its WebSphere MQ Telemetry software.

Integrating systems to improve speed, efficiency and safety

Working with IBM, the company built the WebSphere MQ Telemetry client right into the SCADA system. The SCADA system subscribes to the data while the Eurotech FEP changes the data into the Modbus protocol over TCP/IP and WebSphere MQ Telemetry software. The FEP system polls remote terminal units (RTUs) and reports exceptions to the SCADA system whenever a value changes.

Solution components

Software

- IBM® WebSphere® MQ Telemetry

IBM Business Partner

- Eurotech Ltd.
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The organization can control fuel pumps by sending a message to a specific topic, which is simply a category of information. The RTUs subscribed to the topic generate an electronic ticket with an internal accounting system, which monitors and controls the pipeline.

Achieving greater speed, more reliable data

The company's systems can now take advantage of live, near-real-time data just by subscribing to the appropriate topic, which helped improve system response times. In fact, systems gain an updated status of the pipelines every four seconds. Plus, now that the business uses WebSphere MQ Telemetry software for all of its messaging needs, it has a clearer picture of all of its systems. Finally, the system can quickly recognize pipeline events, allowing the company to quickly shut down a pipeline in case of a safety issue.

The organization plans to continue working with IBM to upgrade its WebSphere software.

For more information

To learn more about IBM WebSphere MQ Telemetry software, please contact your IBM marketing representative or IBM Business Partner, or visit the following website: ibm.com/websphere.

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