CASE STUDY

How Thred is Revolutionizing the Way Industry Uses Data with Pro Mosquitto

thred

Company overview

Thred is a leading provider of data engineering and purpose-built software development services for factories. The company's primary focus is to help businesses build "useful knowledge" across their operations. Having a more in-depth and timely understanding of what is happening, allows these businesses to make smarter and faster decisions, resulting in many benefits, such as increased efficiency, optimized production, and reduced waste.

In addition to providing data-to-knowledge tools and services, Thred specializes in consulting with businesses to create purpose-built software solutions that address their operational requirements. They aim to help customers transform industrial processes to pave the future of automation and achieve their goals.

Industry: Manufacturing

Project: Industrial data as a product

Country: New Zealand

Project background

Thred's projects focus on addressing their customers' specific business needs, such as improving processes, resolving quality issues, optimizing production efficiency, or pinpointing areas of loss.

Recognizing the importance of data in tackling these business challenges, the Thred team set out to create tailored solutions and software. These solutions utilize industrial data and take the form of products such as dashboards, web applications, and sophisticated AI algorithms.

Challenge

Thred's Co-founder, Keiran Stokes, contacted Cedalo while developing a platform for Industry 4.0 solutions. AWS IoT Core was a primary component they used as part of the platform, and they were looking for another MQTT broker to replace it.

By undertaking this search, the Thred team wanted to avoid "vendor lock-in" and have the flexibility to choose another provider. Moreover, they were still deciding whether to primarily use their customers' existing infrastructure, host the solutions themselves, or a combination of both.

Several factors influenced Thred's decision to adopt Pro Mosquitto:

1. It was important for Keiran that the solution had been on the market for an extended period, as he wanted to ensure that it had undergone thorough testing. This was particularly important given that security had become a top priority for most companies, extending beyond just those in the manufacturing industry. Due to this reason, Pro Mosquitto, being initially an open-source project with an established track record and over 600 million Docker pulls, appeared to be the best fit for Thred's needs.

2. In addition, Pro Mosquitto fully satisfied their requirements as a cloud-agnostic, scalable, properly supported on-premises solution that offers MQTT High Availability (HA).

3. Furthermore, Keiran valued transparency and affordability in pricing.

4. He was also especially thrilled to have the opportunity to communicate directly with Roger Light, Mosquitto's creator, and the development team. The interaction instilled a level of trust and the potential for collaboration, which was crucial to their decision-making process.

Thred has a vision to completely change the way industry uses data. They help their clients **make data truly useful** across their organization.

> *"Most businesses aren't converging their operational data with informational data like they say they are, they are simply connecting the two. There is a big difference. If businesses want to make the most of data technology and AI in the operational domain, they need to do more than just extract a bunch of values from a factory historian. They need to seamlessly traverse data across both realms from wherever and whenever they want to. And context is just as important as the values. When talking about a single datapoint, we like to say – you need to know what it is, what it does, and what it affects. Only then will you get the most out of AI."*

Keiran Stokes

Solution

Thred's current architecture employs a shared three-node MQTT broker HA cluster that captures and forwards events and is designed to handle multiple clients simultaneously. The HA cluster is multi-tenanted, so the Thred team can effectively utilize the infrastructure to provide uninterrupted service for all their customers.

Keiran explained, "Events are the raw data of a factory. An event is essentially anything that happens at any given time – temperature changes, a product is produced, a machine faults, etc. Layers and layers of derived insights can be built upon these events. These insights result in actionable improvement and decision-making, often at very high speeds, that directly affect the bottom line. So it goes without saying – it is absolutely critical for our system to collect all events for our clients. Therefore, we went for an HA MQTT broker setup as we cannot afford for our system to go down."

Thred runs their Pro Mosquitto HA cluster on Docker using Portainer and deploys the entire system onto the Google Cloud platform.

A load balancer sits in front of this cluster and serves a dual purpose – it provides them with a dedicated domain to connect to and handles SSL termination. The load balancer then forwards incoming traffic to the Mosquitto cluster, which then uses the HTTP bridge to capture and log every event in Timescale Cloud.

Thred funded the creation of an HTTP bridge feature, with Cedalo lending their technical expertise to make it possible. The feature enables the efficient logging and storing of events by forwarding data from a broker to a storage or web service that provides an HTTP endpoint. In Thred's case, their team created what they call "inserters" – a highly available HTTP endpoint that routes all events to the right timeseries database, based on their topic. These inserters are situated alongside the broker and have load-balancing capabilities, providing flexibility in terms of availability and size.

In addition, the Thred team actively uses Mosquitto Management Center (MMC) to manage their HA MQTT broker instance and leverage access control list (ACL) functionality based on client, role, and group levels to ensure customers can access their data only.

Results

As a result of partnering with Cedalo, Thred acquired a secure, stable, and reliable Pro Mosquitto-based infrastructure integral to their digital solutions.

Consequently, the Thred team assists numerous customers with operations analysis and manufacturing process optimization. They utilize a shared Pro Mosquitto HA cluster to support these endeavors to record production metrics offered as part of a feature-as-a-service to their customers.

> *"By leveraging our unique experience in the area and implementing top-notch tech solutions like Pro Mosquitto, we've also managed to reduce the cost of digital solutions for our customers in the manufacturing industry to approximately one-tenth of the original expense. As a result, our clients benefit from improved profit margins, extra funds to reinvest into new technology and equipment, research and development, expansion to new markets, and more."*

Keiran Stokes

Plans for the future

Keiran expressed, "Cedalo has been a great partner. The industry is changing quickly, and vendors, customers, suppliers, and OEMs need to work together – discover new things, face different challenges, etc. So seeing Cedalo's team embrace this collective spirit is promising and comforting as we continue our involvement with the company. Their ongoing support has been a constant throughout our entire journey."

Currently, the Thred team is developing a product they believe will revolutionize the way industry uses data. Leveraging Pro Mosquitto, this new tool will provide context and meaning to the vast amount of data points flowing in and out of a broker. The product will benefit manufacturers and appeal to a broader audience of businesses implementing event-driven architecture. Thred believes their product will finally make AI truly scalable across factories.

> *"It's exciting. Being at the forefront of a fast-changing industry has its challenges, but we're more motivated than ever. We started this company with the intention of transforming industry. And with supporting technologies like Mosquitto, we feel like we're constantly getting closer to making that a reality."*

Keiran Stokes

According to Keiran, the partnership with Cedalo presents exciting new opportunities for innovation and development. It can redefine how data-driven insights are generated and utilized across various industries.

About Cedalo

Cedalo GmbH is a leading MQTT solutions innovator and has established itself as a reliable partner for the global IoT community. We aim to help organizations implement optimal data infrastructure and IoT architecture to create the digital backbone for their business.

To utilize the full potential of MQTT, we offer a range of dedicated products, including the industrial-grade version of the well-known open-source broker, Mosquitto. Pro Edition for Mosquitto excels in large-scale server installations by processing multiple parallel connections efficiently. It streamlines IoT connectivity in different industries and offers high-quality, user-friendly solutions and exceptional customer support.

We are committed to further developing Pro Edition for Mosquitto and Pro Edition for Streamsheets to help our clients build and maintain various modern software solutions without spending a fortune.

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