BUILDING ENTERPRISE-SCALE MQTT SOLUTIONS

What's Worked Well For Us

inflexion point

Quick Take:

The Case for MQTT At Enterprise Scale

MQTT is a lightweight, reliable way to move OT data to the enterprise - expecially over low-bandwidth or unstable networks.

At InflexionPoint, we've implemented multiple large, enterprise-scale MQTT solutions to collect data from remote sites and deliver it to the enterprise layer for real outcomes, analytics, monitoring, and much more.

Why MQTT

(and why Ignition + Cirrus Link)

In most of our large deployments, we use Igntion with Cirrus Link's MQTT modules. There are various ways to build an MQTT solution, but this tech stack gives us reputable, production-proven components with most of what we need out of the box, so we can deliver value faster without reinventing the wheel.

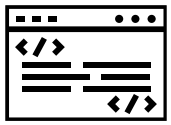
Ignition by inductive automation

Cirrus Link

Start with the Data: Design Fundamentals

Before drawing boxes and arrows, we align on a few essentials.

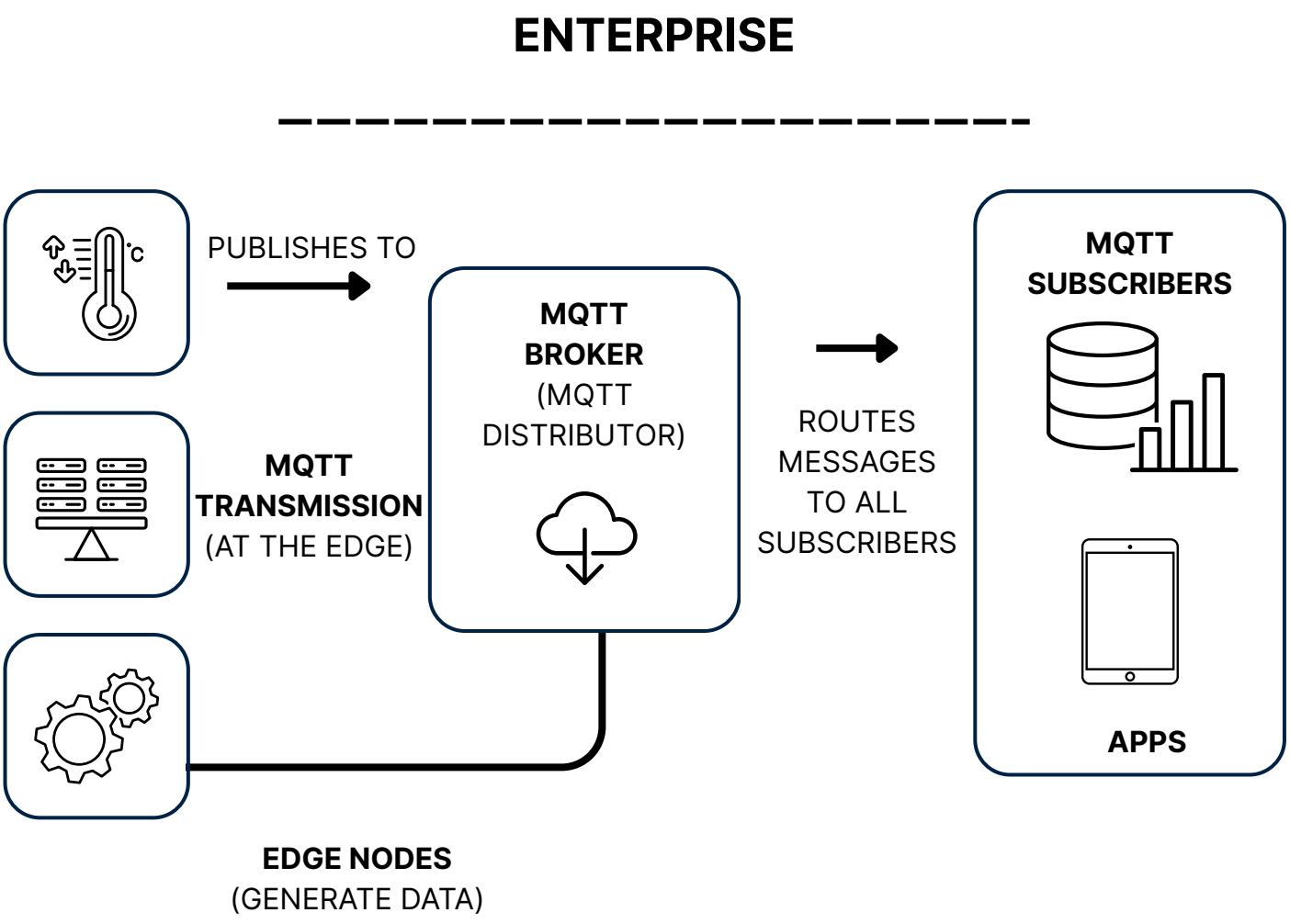
These fundamentals define your architecture, cost and scale.

	Flow of Data: Identify the source and destination paths.
	Shape of Data: Tag types, payload size, and frequency.
	Volume and scale: Number of edge nodes, throughput, and growth.
	Network realities: Firewalls and DMZ shape routing and topology.

These inputs drive the architecture and cost profile.

A Straightforward Reference Pattern

Most of our solutions follow a simple, scalable pattern.



UDTs vs simple tags
(and why it matters)

If you're using Ignition at the edge, decide early whether to publish UDTs or simple tags. UDTs can be convenient, but they carry overhead that affects memory, birth time, and broker/consumer performance. Simple tags are leaner and often a better fit at scale.

What makes Ignition + Cirrus combination powerful is that it also allows you to create and embed data/tag contextualization right at the edge. This helps build and govern a unified namespace, which is something increasingly important as enterprises look for scalable, consistent data structures.

Sizing and Configuration Tips

- Right-size Transmission: base it on per-site payload + frequency, not averages.
- Broker/Engine capacity: model worst-case bursts (recoveries, reconnect storms).
- Firewall/DMZ design: design for east-west and north-south flows you'll actually need, not just the happy path.

Scale and Harden Over Time

One advantage of Ignition + Cirrus Link is that you can start simple and scale:

- Vertically with bigger infrastructure.
- Horizontally with more nodes, brokers, or consumers.

Adding redundancy for high availability at the broker and consumer tiers is straightforward and pays dividends in uptime.

Once Data Lands In The Enterprise

That’s where the real outcomes happen. Common wins we’ve helped teams unlock:

- Faster troubleshooting and reduced downtime: Centralized historians and trending tools mean engineers don’t waste time chasing siloed data. Problems are spotted sooner, root causes are clearer, and fixes happen faster, minimizing costly downtime.

- Improved decision-making at every level: Dashboards and self-service analytics give operators, engineers, and executives a single version of the truth. Plant managers can see real-time performance, executives can benchmark sites, and everyone stays aligned on KPIs.

- Scalable foundation for advanced analytics and AI: A clean, reliable OT data pipeline is the prerequisite for anomaly detection, predictive maintenance, and AI-driven optimization. Without this, these initiatives stall or underdeliver.

- Reduced integration costs over time: Standardizing on MQTT and lean data shapes avoids custom point-to-point integrations, lowers future engineering effort, and speeds up new digital initiatives.

- Greater resilience and flexibility: MQTT's lightweight, store-and-forward architecture lets plants keep working even with unstable networks, reducing data loss risk and ensuring the enterprise sees the full picture.

- Improved regulatory and quality compliance: Centralized OT data pipelines provide accurate, timestamped records to support audits and regulatory requirements, helping industries like pharma, food, and automotive maintain full traceability with less manual effort.

- Business insights through data integration: The real value comes when OT data is combined with business data. That integration unlocks new insights, smarter decisions, and business outcomes that neither layer could deliver alone.

BOTTOM LINE:

Design around your data, networks, and growth curve; choose lean data shapes where possible; and use proven building blocks so you can scale and harden without surprises. If you're exploring MQTT at enterprise scale or want a second pair of eyes on your architecture, we're happy to share more details from the field.

READY TO TALK MQTT?

Whether you're designing your first enterprise-scale solution or optimizing one that's already running, our engineers can help.

YOUR GOALS, OUR GUIDANCE.
SHARED SUCCESS.

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