MQTT Connected Billions of IoT Devices. The Broker Still Holds the Authority.

by Nick Clark | Published March 28, 2026 | PDF

MQTT became the dominant messaging protocol for IoT by providing lightweight publish-subscribe communication through a central broker with minimal overhead, QoS levels, and retained messages. Billions of devices communicate through MQTT brokers. But the broker holds all routing authority. It manages topic subscriptions, enforces access control, routes messages, and governs the topic namespace. The devices publish and subscribe. The broker decides what goes where. The gap is between broker-mediated messaging and protocol semantics where routing authority travels with the content.

MQTT's minimal footprint and QoS semantics made it ideal for constrained IoT devices. MQTT 5.0's enhanced features including shared subscriptions and topic aliases further extended its utility. The gap described here is about protocol authority architecture, not messaging efficiency.

The broker is the authority

Every MQTT message flows through the broker. A device publishing to a topic sends its message to the broker, which then routes it to all subscribers of that topic. The broker decides which clients can publish to which topics, which clients can subscribe, and what QoS levels are permitted.

If the broker is unavailable, communication stops entirely. Devices cannot route messages to each other directly. The broker is not just a convenience; it is the structural authority for all message routing. MQTT 5.0 improved many aspects of the protocol. It did not change the broker-centric authority model.

Topic namespace without semantic governance

MQTT's topic hierarchy is a string-based namespace where topics like sensors/temperature/room1 organize messages logically. But the topic namespace has no governance beyond broker configuration. Any authorized client can publish to any topic. There is no consensus on topic mutations, no structural validation, and no lineage tracking.

In large IoT deployments with thousands of devices and topics, namespace conflicts and organizational drift are common. The topic namespace is whatever clients have published to. It is not a governed structure.

What memory-native protocol semantics provide

A memory-native protocol would embed routing policy and trust authority into each message. A sensor reading would carry its own routing rules: which scopes should receive it, what trust level the reading claims, and what governance constraints apply to its propagation. Routing would occur at the protocol level based on the message's own semantic properties rather than through broker-mediated topic matching.

The broker model could transition from holding routing authority to providing initial configuration and discovery. Operational routing would live in the protocol, carried by every message through the network.

The remaining gap

MQTT connected billions of IoT devices through lightweight messaging. The remaining gap is in the protocol layer: whether routing authority can travel with messages rather than residing in a central broker that every message must traverse.

Memory-Native Protocol All 21 steps →

Authority intrinsic to the object. Routing by semantic properties.

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Last updated: 2026-03-03

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