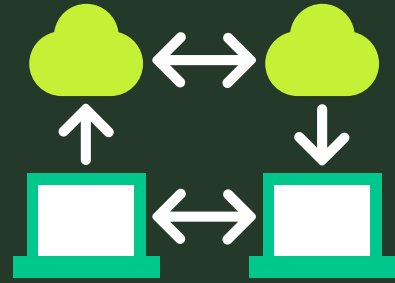# Topics

A low-latency event bus with unbeatable connectivity.

Whitepaper

Momento Topics is a serverless pub/sub messaging service optimized for real-time N-to-N communication at massive scale. With unparalleled ease of use, security, optimization, and scalability, Topics empowers developers to quickly build interactive applications that deliver instant live updates to millions of users.

Reimagining real-time communication

The state of the industry for client-to-client, client-to-server, and server-to-server communication is fragmented, complex, and incredibly crowded. There exists an abundance of well-engineered solutions, each unfortunately constrained by specific assumptions about specific situations, ranging from a carefully-tended service mesh to the wildly-unpredictable consumer internet.

These limitations make it necessary to integrate multiple messaging solutions within the same product. For example, a single modern web app might leverage:

- WebSockets for integrated chat between an end user and a support agent
- Server-Sent Events to push status changes to the user interface
- Long-lived gRPC connections to synchronize state among back-end services
- Amazon SNS for fan-out delivery of notifications to a group of users

Unfortunately, each additional service also introduces a new and substantial set of challenges. Engineers must learn to navigate a variety of protocols, incompatible service constraints, uneven scalability, and ever-accumulating maintenance costs. Next come the product requirements like authentication, access control, observability, and encryption that must be implemented uniformly across this decidedly non-uniform collection of systems.

All together, the complexity of modern communication solutions needlessly bogs down development while driving up risk, time to market, and the number of headaches everyone has to deal with. But it doesn't have to be this way!

Momento Topics reimagines real-time communication to deliver what matters: unrivaled performance, cost-effective scalability, and ease of operation in a single, managed cloud service. Below, we describe the enterprise-grade craftsmanship that makes this possible for Momento Topics, as well as the batteries-included approach that defines the Momento platform.

Crafting a modern communication service

Simplicity is the foremost design principle for Momento Topics. It was built to provide a single, consistent method that solves all types of real-time communication. Momento Topics supports one-to-one client/server communication, one-to-many fan-out delivery, many-to-many client/client communication, and many-to-one messaging — all via the exact same APIs.

Here are just a few of the ways that Momento Topics handles the challenges of real-time communication for you:

Dynamic configuration: Developers can integrate with Momento Topics in just a few lines of code, thanks to intuitive APIs that abstract away the complexities of backend infrastructure. For example, channels require zero setup, instead relying on a deterministic rendezvous hash so that they can be created instantly in response to subscription changes.

Fully-managed connections: The Momento Topics SDK automatically selects the best protocol for the subscriber whether it's a server, a browser, a mobile app, a legacy device, or even an embedded environment. The SDK also provides pre-built configurations with parameters fine-tuned for each environment to ensure a solid connection.

Robust message delivery: Messages published through Topics are tracked with sequence numbers to prevent duplicate delivery and identify dropped messages. Each channel also leverages a message replay buffer to ensure that brief connectivity gaps won't cause a client to desynchronize.

Distributed and scalable by design: Momento Topics leverages a unique dual-layered architecture which enables seamless autoscaling and efficient resource allocation. Proactive load management ensures that message delivery remains consistently fast, regardless of the number of subscribers or messages, making it ideal for applications requiring real-time updates.

Stateless consumers: Stateless compute services like AWS Lambda or Cloudflare Workers are a staple of modern serverless architectures, yet they cannot be integrated with many pub/sub solutions.
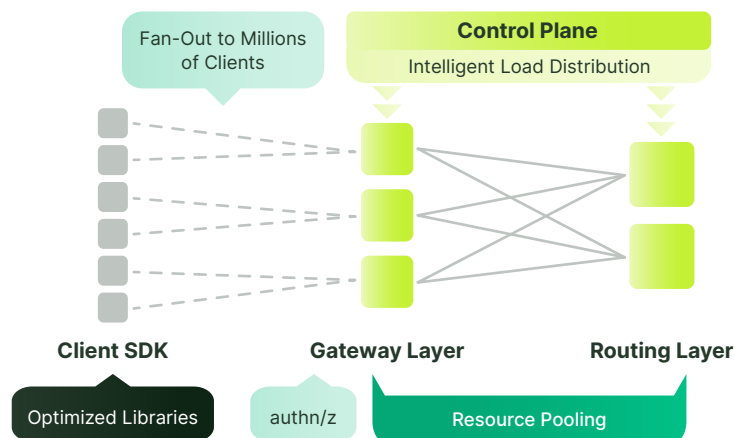
Momento Topics supports delivery to ephemeral consumers via webhooks. When a message is published, Topics sends an HTTP POST request to the configured endpoint, including a header signature for sender verification.

Together, these and other features make Momento Topics a flexible one-stop shop for your application's real-time communication needs. Don't let your team waste time integrating with a dozen different solutions! With Momento Topics, you can focus your attention elsewhere knowing that your event bus will get messages where they need to go.

A platform that's ready for prod, now

At Momento, our mission is to empower engineering teams with a better cloud platform. Like all of our services, Storage is fully-managed and built for scale, with a streamlined development and operational experience. With fewer distractions, your team can focus on going to market faster. Below are a few examples of how the Momento platform accelerates your work:

Momento Gateway: The Momento Gateway layer handles fan-out for each of our services across millions of simultaneous client connections. It integrates an expansive set of features, including authentication, access control, multiple transport protocols, and more. The Gateway layer does the heavy lifting to make your product production-ready immediately.

Client SDKs: Momento services accept connections directly from client devices, so our client SDKs incorporate robust connection management with support for gRPC, WebSockets, and HTTP, among others. In addition, these SDKs implement various optimizations and best practices, such as binary serialization and Zstandard compression.

Resource Pooling: Momento designs services to rapidly scale individual workloads by reallocating warm resources where they are most needed. This shared pool approach creates a vast, but still cost-effective, reservoir of capacity for workloads to draw upon when necessary.

Intelligent Load Distribution: Each Momento service incorporates an intelligent control plane that proactively manages the distribution of load. Deep instrumentation enables the control plane to carefully monitor and scale the system along multiple dimensions. This prevents the system from being overwhelmed while maintaining resource and cost efficiency.

The Momento platform embeds deep expertise about the experience of developing and operating global-scale products. We've built such products ourselves, and we've worked with our customers to build countless more. With the Momento platform, that expertise works for you.

Get going.
Keep going.

Momento Topics delivers millions of events each week to tens of thousands of devices and servers for mission-critical real-time applications.

It offers the delightful Momento experience you know and love that has enabled enterprises to integrate and go to production in less than four weeks. Plus, our world-class customer support will be there for you the entire way!

Contact us today. ↗