Realtime Event Streaming and Processing from Edge to Core for Enterprise Grade Systems

By 2025, 30% of all data produced in the world will be realtime[1]. Half of this data will be created inside companies, with the other half being generated by consumers.

Users' expectations of realtime digital experiences means that relevance - both for market incumbents and challengers - depends on how well realtime data is exploited. This is driving the rapid growth of event-driven architectures that can handle high frequency workloads - large volumes of data sent back and forth at high speed - with ever increasing amounts of data created at the edge.

Capture, transition and process realtime data with Ably and Aerospike

Combined, Ably and Aerospike provide asimple and highly reliable solution for the capturing, transitioning and processing (including read/write queries) of event-driven data from millions of mobile, web and IoT devices.

The combined solution can power a wide span of realtime use cases at a scale and resiliency previously not possible. The solution can apply to any type of synchronized digital experiences where large numbers of people or devices are generating large streaming datasets that need to be analyzed and responded to.

Key use cases that require this type of event stream processing include:

- Audience engagement for live streaming or virtual events
- Gaming
- Bidding and sports betting
- Advertising and marketing technology
- Realtime user behaviour analysis or recommendations
- IoT and connected devices

THE AEROSPIKE + ABLY DIFFERENCE

- High availability & scalability
- Fault-tolerant both at a local and global level
- Operates at low latencies
- Guaranteed delivery, message ordering and exactly once semantics end-to-end
- Instant scaling to millions of devices with no need for provisioning
- Easy and cost-effective to build and expand on

[1] Zdnet 11/18

Unlimited scale, strong consistency and high reliability

At its core, the combined solution of Ably and Aerospike is a global scale streaming and event processing system with a focus on strong consistency and high reliability. Their natural fit is enhanced by a connector based on the Aerospike ESP (event stream processing) Publisher.

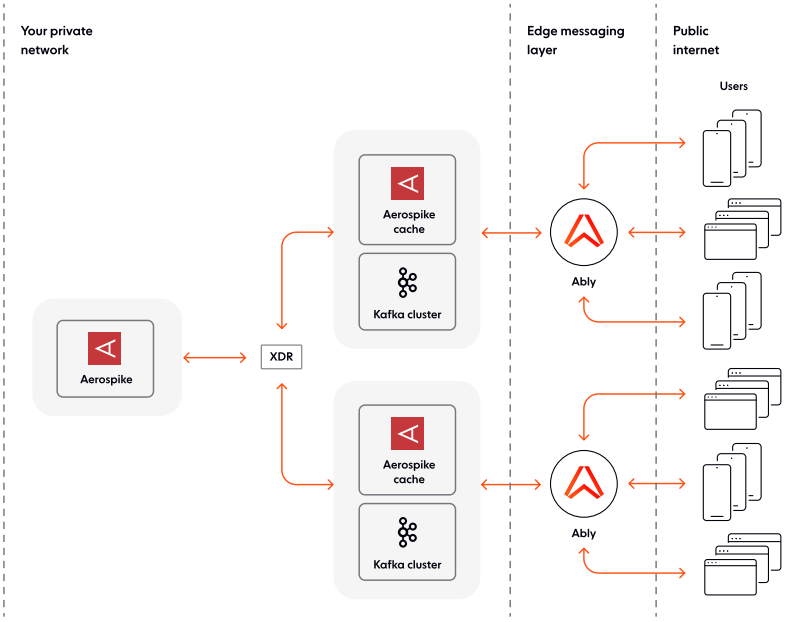


Figure 1: Aerospike and Ably

The Ably difference

Ably is an edge messaging platform designed with resilience at its heart and mathematically modelled to work regardless of the volume of messages, number of connections opened, or the quality of the network. It is fault tolerant and ensures sufficient redundancy at a regional and global level to ensure continuity of service even in the face of multiple infrastructure failures, with 99.999999% message survivability.

Ably delivers predictable 65ms round trip latency for the 99th percentile and guarantees message delivery, message ordering, and exactly-once semantics (even when the message is sent multiple times due to disconnection).

Ably delivers over 550 billion messages to more than 250 million end-users each month via 15 datacenters and 205 edge acceleration points of presence. It is designed with multiple security mechanisms for data distribution across network boundaries, from network-level attack mitigation to individual message-level encryption, so the data remains secure throughout its entire transit.

The Aerospike difference

Aerospike is a high-performance, high resilience database that spans multiple datacenters and allows for uninterrupted access even during localised outages. It can deliver billions of transactions in real time and can give its customers resilience at gigabyte, terabyte and petabyte scale.

Aerospike delivers realtime data in a much smaller server footprint – up to 80% fewer servers than alternative solutions – resulting in a significant reduction in the total cost of ownership (TCO). This is thanks to Aerospike's patented Hybrid Memory Architecture (HMA) that exploits DRAM, persistent memory, hybrid flash and all flash configurations. In terms of how Aerospike fares against other data platforms for performance, multiple benchmark studies that follow industry best practices are available.

Aerospike delivers globally distributed, strongly consistent transactions at scale in a highly resilient realtime data platform. When combined with Ably, that platform can continue operation even when data is sent over unreliable connections, even during sudden multi-region datacenter failures. Ably is uniquely suited to guarantee the data transitions and deliveries into the Aerospike system, so regardless of what happens in the transit, all data is delivered to Aerospike at speed.

Ably+Aerospike Solution Benefits

Predictability of latencies

- Ably guarantees <65 ms round trip latency for 99th percentile (p99) with unlimited channel throughput.
- Aerospike delivers <10ms reads and sub-second writes for p99 regardless of scale.

Integrity and accuracy

- Ably provides message ordering, guaranteed delivery and exactly-once semantics from message capture to delivery.
- Aerospike offers a strong consistency mode that guarantees no stale or dirty data is read and no committed data is lost.

Enterprise grade reliability

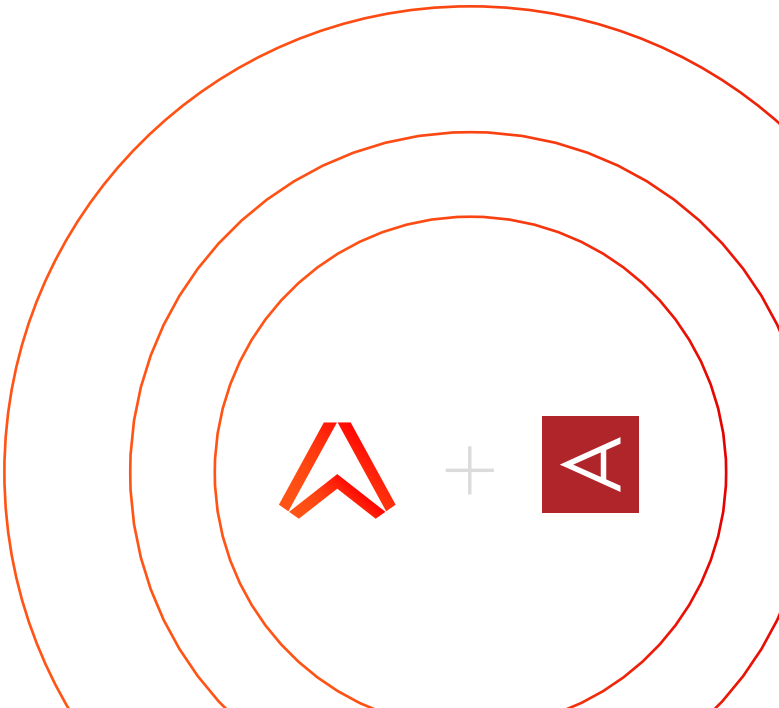
- Ably provides tolerance at regional and global levels and can withstand multiple infrastructure failures and still deliver 99.999999% message survivability.
- Aerospike delivers 99.999% reliability in core and edge systems regardless of scale.

'Always on' availability

- Ably is designed for high availability and provides a 99.999% uptime SLA.
- Aerospike features global data replication in both active/active/ and active/passive modes and can survive multiple levels of node, cluster, and site failure.

Scalability

- Ably is powered by a dynamically elastic and highly available global edge network that can quickly scale horizontally to an unlimited number of channels and millions of concurrent subscribers. It has a 50% capacity margin to elastically deal with instant surges in demand.
- Aerospike can scale from gigabytes to petabytes with sub-millisecond reads/writes. It's patented hybrid memory/flash storage layer supports high data ingestion rates for real-time analytics and ML-based decisioning.



Extend your Kafka pipelines to the Edge

By using Ably and Aerospike together with Kafka, you can create a complete high throughput and low latency realtime streaming pipeline - from your end users's devices on the internet to your core, and back.

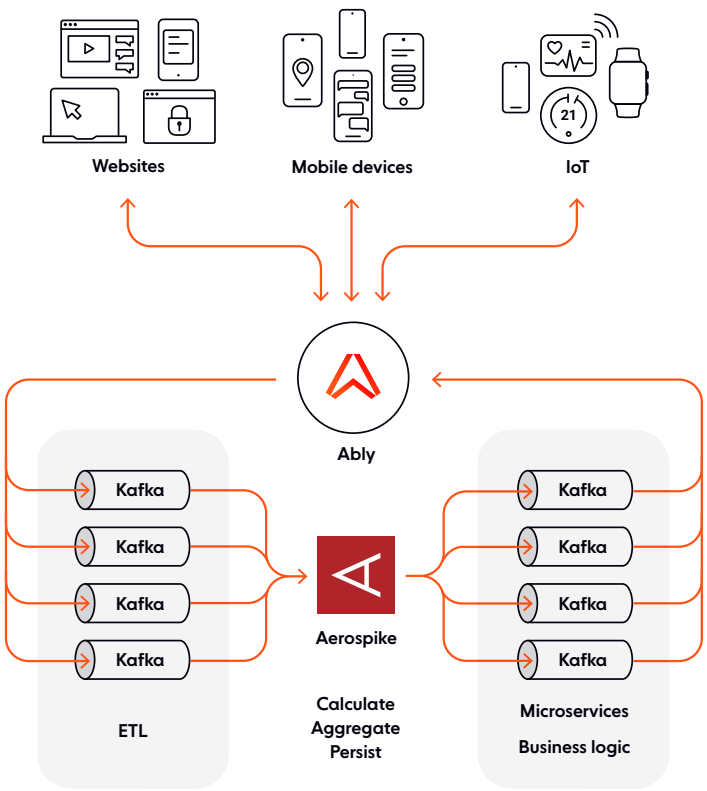


Figure 2: TBC

Using our solution, companies can maximize any existing Kafka (and event data streaming, in general) implementation with the easiest enablement of data flow in both directions:

- Aerospike provides Kafka a scalable, reliable system of record with flexible schemas that enable you to create a materialised view of your data. By using Aerospike with Kafka, you can run calculations and user-defined functions to basically transform the data into something that is actionable the moment you receive it.
- Ably is naturally complementary to Kafka, and offers the same guarantees, messaging semantics, and characteristics. As it was designed for realtime data streaming over the Internet, it acts as an Internet-facing layer which allows realtime data to be ingested into Kafka (and streamed out of Kafka) without any risks and additional provisioning.

Both Ably and Aerospike provide best-in-class integrations with Kafka - see Aerospike Connect for Kafka and the Ably Kafka Connector.

The Ably+ Aerospike joint solution directly addresses the challenges around adding and handling realtime event streaming in terms of reducing friction, implementation time, and cost. Developers can focus on what makes their product special, instead of handling connectivity and data processing challenges on the hosting infrastructure.

About Ably

Ably is a realtime edge messaging platform used by companies across the world to power the live and collaborative digital experiences on which we rely everyday - such as engaging an audience with chat and presence features in a live streaming social event, receiving realtime financial information on your banking app, or monitoring live car performance data.

Organizations like Bloomberg, HubSpot, Split and Verizon depend on Ably's platform to offload the growing complexity of business-critical realtime data synchronization.

Ably's suite of APIs offers an easy way to build, extend, and deliver powerful digital experiences in realtime. Its fault-tolerant, highly-available, elastic global infrastructure distributed across 15+ core routing data centers and 205+ Edge Acceleration PoPs give engineering teams effortless scaling, low complexity, and zero DevOps overhead.

With 25+ SDKs and native support for more than six realtime protocols, getting started for any use case is fast and simple.

About Aerospike

The Aerospike Real-time Data Platform enables organisations to act instantly across billions of transactions while reducing server footprint by up to 80 percent. The Aerospike multi-cloud platform powers real-time applications with predictable sub-millisecond performance from terabytes to petabytes of data with five nines uptime with globally distributed, strongly consistent data.

Applications built on the Aerospike Real-time Data Platform fight fraud, provide recommendations that dramatically increase shopping cart size, enable global digital payments, and deliver hyper-personalised user experiences to tens of millions of customers.

Customers such as Airtel, Experian, Nielsen, PayPal, Snap, Verizon Media and Wayfair rely on Aerospike as their data foundation for the future. Headquartered in Mountain View, California, the company also has offices in London, Bangalore and Tel Aviv.