Five Signs You've Outgrown Redis

Many firms find Redis easy to use when their data volumes and workloads are modest, but that changes quickly as their needs grow. High ownership costs, poor performance at scale, and increased operational complexity with Redis can cause budget overruns, service-level agreement (SLA) violations, and delayed application rollouts. That's when Aerospike can help.

A NoSQL key-value database, Aerospike delivers ultra-fast performance for read/write workloads at scale, high availability, exceptional scalability, and strong data consistency. Firms in finance, technology, retail, and other industries use Aerospike for critical applications everyday. Indeed, one Redis user migrated to Aerospike to "flawlessly" handle its massively growing operational data. Another cut costs 85% by moving from Redis to Aerospike.

What are 5 signs that you may have outgrown Redis?

Sign 1	**You're worried about TCO (total cost of ownership).**
Sign 2	**You need scalability and elasticity.**
Sign 3	**You need persistence with high performance.**
Sign 4	**You need strong data consistency.**
Sign 5	**You need manageability and operational ease at scale.**

Sign 1: You're worried about TCO

Soaring data volumes and competitive pressures are forcing firms to deliver new applications faster and process 10s - 100s TB of data (or more) in real time. Such demands can stress Redis clusters, prompting users to deploy more nodes, memory, and manpower. That drives up total cost of ownership (TCO).

Aerospike's patented Hybrid Memory Architecture™ (HMA) operates so efficiently that it often reduces TCO by 5 times or more compared with cache-based solutions like Redis. Indeed, we estimated costs of running Aerospike with 3 different Redis configurations over a 3-year period for a 40TB database with a 25% YTY growth rate. Our sample scenario involved an evenly split read/write workload operating on Amazon EC2 instances. Aerospike delivered substantial savings in Year 1 over every Redis configuration; by Year 3, Aerospike's cumulative savings ranged from $2.2 million to $8.7 million, depending on the required Redis footprint.

Cost comparison: Redis vs. Aerospike
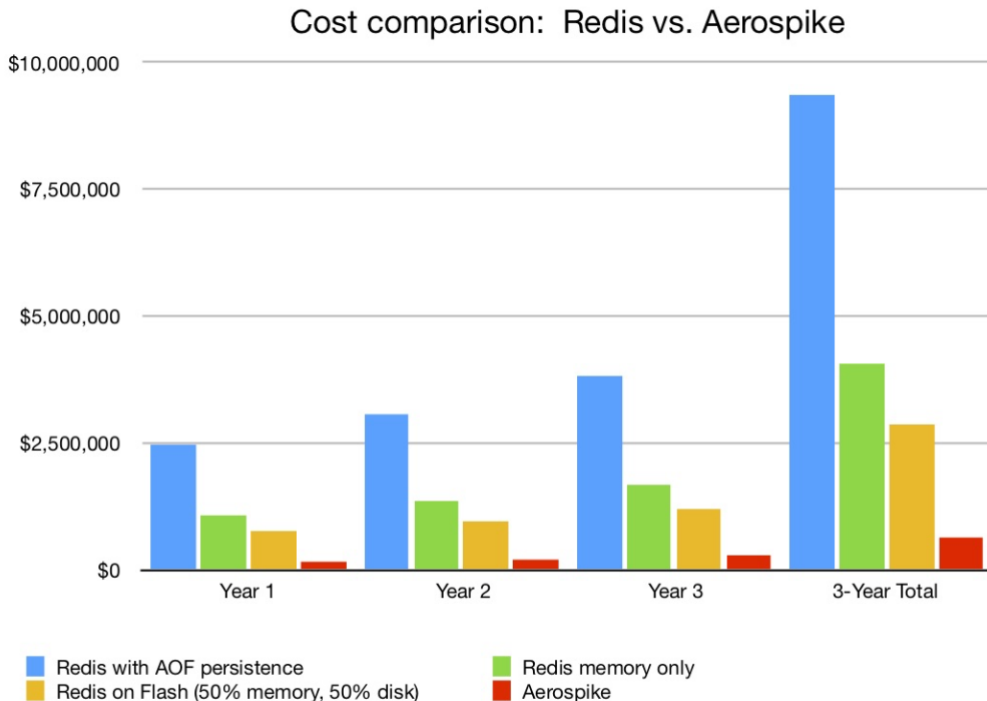
Sample 40TB database with 17 billion 500-byte primary objects and 17 billion replica objects. 25% YTY data growth. Evenly spilt read/write workload with random distribution of operations across keys.

Sign 2: You need scalability and elasticity

Firms often add more nodes -- and DRAM -- to scale Redis, largely because it's a single-threaded system originally designed for in-memory processing. But DRAM is expensive, and managing increasingly large clusters isn't easy. Redis on Flash (ROF) doesn't solve these problems because it keeps metadata and indexes in memory, caches "hot" data for performance, and relies on memory-hungry RocksDB processes behind the scenes.

Redis configuration requirements inhibit elasticity too. A cluster can only be scaled out by a multiple of the current number of shards, and users can't remove shards from a cluster. So quickly scaling up before peak periods or down afterwards can be painful and expensive.

Not so with Aerospike. Dynamic cluster management, automatic data redistribution, a smart client layer, and cost-efficient use of volatile and non-volatile memory (DRAM and SSDs) contribute to Aerospike's exceptional scalability and cost efficiency. For example, one organization shrank its footprint from 40 to 6 nodes after migrating from Redis to Aerospike.

Sign 3: You need persistence with high performance

Ever wonder why Redis publishes benchmarks that use full DRAM instances and only 1 copy of user data? As many firms have discovered, persistence in Redis -- via snapshots and append-only files -- can drastically reduce performance and even lead to data loss.

By contrast, Aerospike was built with persistence in mind. Published benchmarks feature its default configuration of indexes in DRAM and user data on flash (SSDs). Users freely share results of their own benchmarks -- something Redis

users find difficult due to licensing restrictions. Aerospike users often enjoy sub-millisecond data access speeds even with hundreds of billions of records in databases of 10s - 100s of TB.

Sign 4: You need strong data consistency

Redis supports eventual consistency, which can result in stale reads and even data loss under certain circumstances. The WAIT command is most closely associated with consistency, yet Redis documentation acknowledges that *WAIT does not make Redis a strongly consistent store.*

On the other hand, Aerospike supports strong, immediate data consistency for record-level transactions. It guarantees that write transactions will be applied in a specific sequential order and will never be lost. For each read transaction, Aerospike users can choose full linearizability or session consistency. Aerospike clearly passes the Jespen test, which Redis has yet to do.

Sign 5: You need manageability and operational ease at scale,

Even if your data volumes are modest today, what will happen as your needs grow? Scaling Redis requires substantial memory and leads to large clusters, which means more complexity and more frequent node failures.

Do you use Redis as an in-memory cache for a persistent SQL or NoSQL data store to speed your access to data? If so, you're probably working hard to manage and synchronize both environments so your applications don't access stale data or experience slow performance due to cache misses. Moreover, covering the operational costs of scaling two systems can be daunting, particularly as your data volumes and workloads grow.

By contrast, Aerospike manages extremely large data sets on comparatively small server footprints, yielding a reliable, simpler environment. Our comparative TCO scenario showed that Aerospike's footprint was only 9% - 23% of what Redis would require, depending on its configuration. It's no surprise that a number of firms have replaced their two-tiered data layer with Aerospike for ultra-fast access to persistent data.

Get ready for the future with Aerospike

If you're struggling to achieve what you want with Redis -- or if you've experienced any of the 5 signs just discussed -- why not explore what Aerospike can do for you? Plenty of other firms have, and they're enjoying tangible business benefits as a result. Email info@aerospike.com to estimate TCO savings for *your* workload and see how you can benefit, too.

For the full report on "Five Signs You Have Outgrown Redis" please download our White Paper.