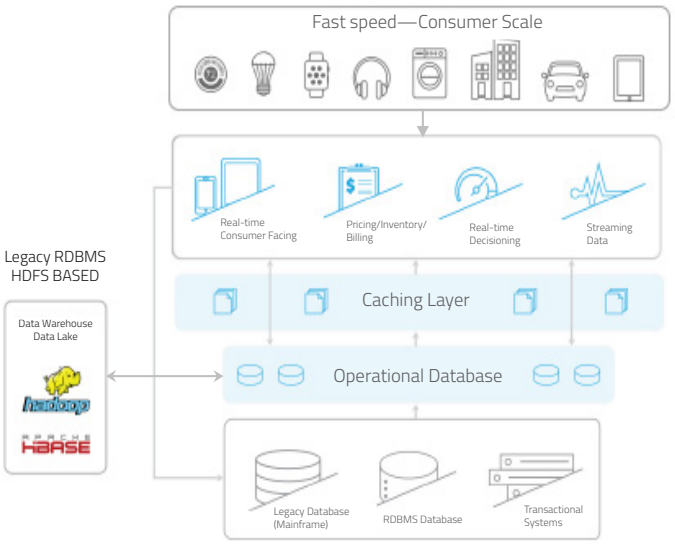
Cacheless Architectures for Digital Transformation: Why They Matter, and What You Need to Know

Organizations are embracing digital transformation to create a competitive advantage by either building entirely new systems of engagement (SOEs) or by attempting to retool existing SOEs. SOEs are real-time, operationally focused, edge-based systems and services, such as mobile and social apps, videos, cloud, and big data, that are core to many businesses. SOEs require data consistency, speed, uptime, and availability.

In many cases, organizations are enabling new SOEs via traditional approaches such as an RDBMS or other storage layer, perhaps similar to a 1st generation NoSQL DB, along with a caching solution to enable the real-time speed these systems require. See Figure 1 for an example architecture used to enable these types of systems.



Challenges

- Complex
- Maintainability
- Durability
- Consistency
- Scalability
- Cost
- Data lag

Figure 1

Part of the challenge organizations face is that architecture and infrastructure approaches have changed dramatically in the last few years, creating a significant competitive advantage for organizations willing to embrace next-generation architectures to solve real-time problems. There have also been advances in hardware storage (NVMe and Optane storage) and DB architecture, which fundamentally change how organizations solve these types of problems.

Organizations that have embraced a new cacheless hybrid memory DB architecture have demonstrated they can increase overall performance of real-time applications, at scale, improve uptime and availability, and dramatically reduce total cost of ownership (TCO) as compared to traditional RDBMS/cache-based solutions and 1st generation NoSQL solutions.

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See Figure 2 for a significantly different architectural approach. True hybrid memory architectures or cacheless architectures remove a layer from the technology stack, creating enormous simplification and significantly lower TCO, all while improving overall performance for lower latency SOE applications.

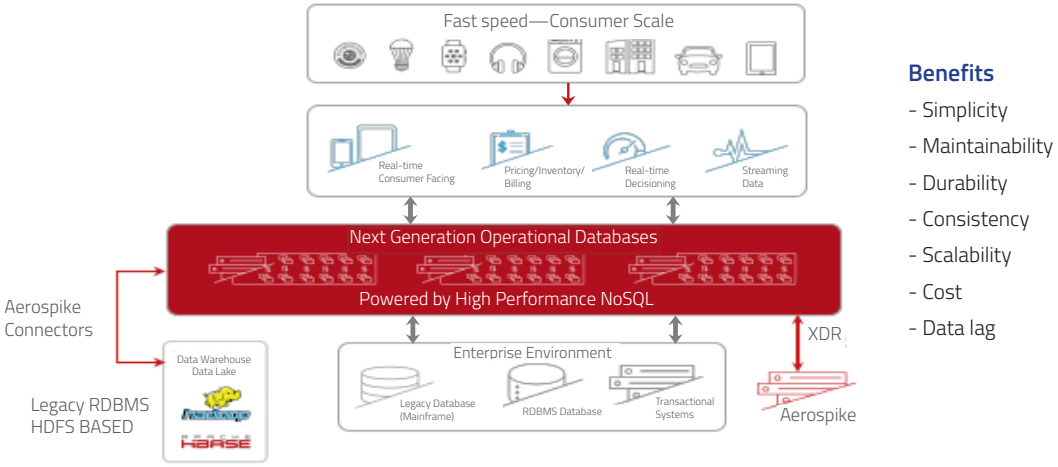

Figure 2

Why is a hybrid memory architecture important?

True hybrid memory systems:

1. Store indices in memory (DRAM) and data on SSD storage, reducing server count by up to 10 times. They also use NVMe drives at one-sixth the cost of DRAM and dropping.

2. Are multi-threaded, massively parallel systems.

3. Significantly improve uptime and availability, without manual DevOps processes.

4. Require data consistency. A true hybrid memory system is capable of mixed workload (true concurrent read/write), synchronization within a cluster, and asynchronous communication across remote clusters.

5. Provide predictable performance, irrespective of workload, WITHOUT a traditional caching layer.

6. Lower TCO, creating a competitive advantage and enhanced business value. A true cacheless architecture reduces server footprints by a factor of three or more and hardware costs by a factor of six or more.

Organizations embracing digital transformation to build SOEs should consider a cacheless hybrid memory architecture to deliver predictable performance and create a competitive advantage, at a lower TCO.

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