

Leading eCommerce Company Tests Auto Cache Invalidation

Challenge

To keep pace with growth and demand, one of the world's largest eCommerce platform companies wanted to boost the performance and scalability of its existing Oracle database environment. The company sought a solution that would not only enhance the overall performance of the company's web-based ordering platform but would also enable the team to transparently cache dynamic content without serving stale or inconsistent data. The company considered expanding its infrastructure to solve performance concerns, but this approach would require purchasing additional servers, capacity, and Oracle licenses. This option was extremely expensive and lacked the ability to cache dynamic data.

A key area of interest for this eCommerce company is user profile and shopping cart data. These two data sets are both accessed frequently and change frequently. For example, users routinely add items to their carts or update their address or password. In a database scenario, any data that's accessed frequently is an appealing candidate for caching, since doing so would offload the database server. However, since this kind of data is changing all the time, it's hard to cache using traditional technologies. ScaleArc, with its unique automatic cache invalidation technique, solves this dilemma, enabling user-specific data to be invalidated immediately with any new writes to that data.

ScaleArc's Database Load Balancing Software for Oracle

After some research, the company decided to test ScaleArc's database load balancing software to compare the performance and scalability of its current environment with and without ScaleArc's software. ScaleArc's software was deployed transparently between the Oracle database and the company's app servers, with an ACID-compliant NoSQL cache that can dramatically accelerate apps and reduce the burden on the company's Oracle servers. ScaleArc's auto cache invalidation technique makes it possible to cache objects that cannot tolerate any data inconsistencies, such as shopping carts and user profiles. ScaleArc's cache is transparent to applications and does not require any changes to the application or database layer.

ScaleArc's Auto Cache Invalidation

ScaleArc's auto cache invalidation capability enables true ACID-compliant caching. This method tracks data changes by extracting metadata from update or delete queries or from within SQL comments. ScaleArc's auto cache invalidation feature uses the transparent NoSQL technology by extracting metadata from the query and tagging the cache objects used to associate cache entries with invalidation queries. With this invalidation method, ScaleArc can ensure that its cache will not serve stale data. This feature significantly increases the types of data to cache without the risk of data inconsistency. For more information on auto cache invalidation

www.scalearc.com/how-it-works/features/automatic-cache-invalidation

Testing with ScaleArc

After deploying ScaleArc’s database load balancing software in its Oracle database environment, the team conducted several rounds of testing.

Test bed

Database server: Sun SPARC T4-2 with 128 threads, 512 GB RAM, integrated Flash storage

ScaleArc server: 16-core, Intel Xeon, 96 GB RAM

Query response sizes: 4 KB and 128 byte

Performance Rates

The company conducted testing across two query sizes – testing with and without ScaleArc for each. One test used a 4 KB query response size, typical of queries related to user profile data, shipping addresses, or shopping cart data. The other test was based on a 128-byte query response size, such as would correspond to user name or password data.

For the 4 KB query response size, directly accessing the Oracle server yielded a performance of 7,000 queries per second (QPS). Leveraging ScaleArc, with auto-cache invalidation enabled, the company saw performance increase to 46,000 QPS (see Chart 1).

For the 128-byte query response size, directly accessing the Oracle server delivered 46,000 QPS. Leveraging ScaleArc and its caching, performance increased to 336,000 QPS (see Chart 2).

Chart 1: 4 KB Query Response Size

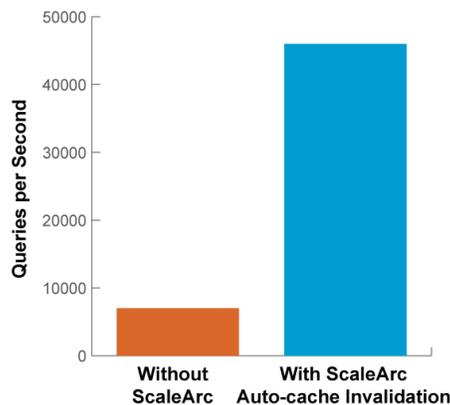
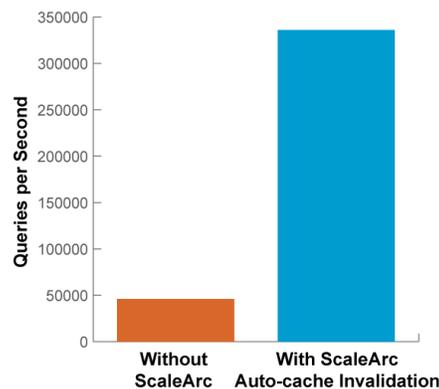


Chart 2: 128-byte Query Response Size



Response Time

In addition to measuring the QPS rates, the eCommerce company also measured response times – that is, how quickly were queries answered. Throughout the testing, the company observed that response time increased 6x to 12x, depending on the query response size. The larger query sizes benefit more for the performance increases of ScaleArc's innovative caching technology.

Key Findings

This testing highlighted a number of key findings for this eCommerce company.

- 1) **ScaleArc makes it safe to cache dynamic data.** Seeing this technology in active gave the company the confidence to cache data it had never deemed safe to cache before.
- 2) **ScaleArc's caching requires no code changes.** The ScaleArc software supports caching, and highlights queries that are a good candidate for caching, without recoding the application.
- 3) **The ScaleArc option provides the best economics.** The cost of the ScaleArc software and the server to support it were both far less expensive than expanding the database server infrastructure.

With ScaleArc, the eCommerce company's database environment was able to achieve workloads that weren't even possible in the past. The company was able to scale up seamlessly, improve response time, and serve more traffic by caching data that couldn't have been cached before. The ScaleArc software also provided the company a means to extend the life of its existing infrastructure, with no app changes or new hardware.



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ScaleArc is the leading provider of database load balancing software. The ScaleArc software inserts transparently between applications and databases, creating an agile data tier that provides continuous availability and increased performance for all apps. With ScaleArc, enterprises also gain instant database scalability and a new level of real-time visibility for their application environments, both on prem and in the cloud. Learn more about ScaleArc, our customers, and our partners at www.ScaleArc.com.

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