

# MEETING THE AVAILABILITY AND PERFORMANCE CHALLENGES OF RETAIL & ECOMMERCE APPLICATIONS

## INTRODUCTION

In order to maximize revenue, today's retailers need state-of-the-art backend systems to support their business processes. Whether an established mega-retailer like Best Buy or a fast-growing "flash" shopping site like ideel (ideel.com), retailers know that downtime and latency severely impacts revenue. Fast load times equal increased sales, while slow load times lead to abandoned shopping carts and decreased revenue. With customers expecting immediate access no matter what device they are using or where they are located, retailers have an opportunity to compete without necessarily lowering prices. Instead, retailers can differentiate themselves by delighting customers with an exceptionally fast and easy shopping experience.

## RETAIL AND ECOMMERCE CHALLENGES

Today's consumers expect the shopping experience to be fast, easy, and even fun ... from any device, anywhere. This is both a primary challenge and opportunity for online retailers. Meet expectations and your happy customers will buy more and tell their friends about you. Increased sales not only helps the bottom line, but massive amounts of customer data can provide valuable insights to inform future business and marketing decisions. However, a slow, frustrating user experience will decrease sales as well as any customer data that you might have gathered.

The technical underpinnings of delighting customers are varied. While one retailer wants to store user profile, preference, and behavior data, another is having trouble managing product catalogs, ratings, and reviews. Other technical challenges include:

- Tracking shopping carts and wallet data
- Managing keyword search information
- Keeping transaction logs
- Managing sales and return data
- Pushing data to a private or public cloud

## WHY RIAK® KV FOR RETAIL & ECOMMERCE?

- HIGH AVAILABILITY
- FAULT TOLERANCE
- ENHANCED SCALABILITY
- LOWER TOTAL COST OF OWNERSHIP

Database infrastructure needs to be robust. Historically, retail businesses have relied on Relational Database Management Systems (RDBMS), but these systems are not designed to deal with the high volumes of unstructured data created in today's "always open for business" eCommerce world. To compete, retailers need to replace outdated database infrastructure with systems that can efficiently respond to customer demands and analyze customer data. This requires high availability, fault tolerance, and massive scalability.

Riak KV is designed to meet retailers' needs. Riak KV is a distributed NoSQL database architected to make sure your data is always available, for both read and write operations, everywhere. If a node or cluster fails, your customers won't know it. And no matter how big the load, every request will be served. If you have large objects or need to push data to AWS-hosted clusters in multiple availability zones, then add-on Riak S2 for a seamless experience.

## RETAIL & ECOMMERCE ON RIAK KV

Retail and eCommerce customers chose Riak KV, because it delivers constant uptime, fast performance, and the ability to scale at a lower cost than traditional relational databases. For example, Best Buy selected Riak as an integral part in the transformation push to update its eCommerce platform, and Ideel chose Riak to provide its highly available, event-based shopping experience. Both of these deployments were possible, because Riak KV was designed for:

### HIGH AVAILABILITY

Riak KV favors data availability, so that even in the event of hardware failure or network partition, customers experience an “always on” shopping experience. Riak KV also ensures the system can always accept writes and serve reads at low-latency with high responsiveness, allowing retailers to serve product information quickly and accept changes to shopping carts.

### FAULT TOLERANCE

Hardware malfunction, network partition, and other failure modes are inevitable. Riak KV provides a failure-resilient infrastructure by replicating data automatically within the cluster so nodes can go down but the system still responds to requests.

### ENHANCED SCALABILITY

During major holidays and other periods of peak load, retailers should significantly increase their database capacity. Riak KV

enables easy capacity increases. When new nodes are added, Riak KV automatically distributes data evenly to naturally prevent hot spots in the database, and yields a near-linear increase in performance and throughput when capacity is added.

### LOWER TOTAL COST OF OWNERSHIP

Riak KV Enterprise allows replication of data to multiple data centers, providing both a global data footprint and the ability to survive datacenter failure. Its masterless architecture allows for simply scaling cluster size, for capacity or performance, on commodity hardware thereby reducing investment and capital expenditure for unpredictable seasonal traffic. Being able to achieve this scale in an operationally simple fashion, across multiple geographic locations, further reduces operational expense and drives customer satisfaction.

## KEY RIAK KV USE CASES

### SHOPPING CART / WALLET DATA

Based on many of the same architectural principles that power Amazon’s shopping cart, Riak KV is designed to offer an “always on” experience for users — even if failure conditions such as hardware failure and network partitions occur.

### CONTENT MANAGEMENT & DISTRIBUTION

Content is king. But today more and more of that content is unstructured. Riak KV is a fundamentally content-agnostic database. You can use it to store anything you want – from JSON to XML to HTML to binaries to images and beyond. Riak S2 is for large object storage when you need to store terabyte-size files or scale to petabytes of object storage.

### SESSION DATA, USER DATA, AND PROFILE MANAGEMENT

Keeping track of user profile, preference, and behavior data is important for a good customer user experience, as well as giving retailers valuable insights into how to better serve and market to their customers. Riak KV is uniquely architected to handle user and session data and is able to serve these requests with predictably low latency.

### LOG STORAGE, ANALYSIS, AND INDEXING

Customers are relying on Riak KV for everything from tracking transaction logs and conducting behavioral analysis to error checking for duplicate API calls and A/B product testing and analysis.

### BUSINESS CONTINUITY

Even minutes of application downtime can mean lost sales, a poor user experience, and a bruised brand, adding up to millions in lost revenue. Riak KV Enterprise with Multi-Cluster Replication ensures business continuity in the event of an outage. Riak KV has an innovative database architecture that provides fast read and write functionality for globally distributed data.

### LARGE OBJECT STORAGE

Maybe you need your own private cloud storage or, perhaps, just more reliable object storage behind your application. Basho Riak S2 is software-defined object storage designed to provide simple, available, distributed cloud storage at any scale, and can be used to build cloud architectures — public, private or hybrid — or as storage infrastructure for heavy-duty applications and services.

## CHANNEL CONNECTIONS

Mobile sites and apps are an important part of a comprehensive retail strategy, with more and more users viewing, buying, and sharing products via their mobile devices. Riak KV is ideal for low-latency, always-available small object storage to power mobile experiences across platforms.

## API PLATFORMS

Increasingly, retailers are operating their online and mobile infrastructure as data platforms: exposing product information and other data through APIs to fuel business development,

affiliate growth, and rapid application development to support multi-channel retail requirements. As the foundational storage layer for a retail platform, Riak KV provides low latency object storage with a flexible, schemaless design for rapid application development. Riak KV offers both a straightforward, RESTful HTTP and a highly performant protobufs API. Developers don't have to deal with underlying complexity of what data lives where, and operators can add machines easily to yield near-linear performance and throughput improvements when data sets grow.

## CONCLUSION

The hugely competitive Retail and eCommerce market can be won or lost based on understanding and responding to customers. Customers have high demands and expect a fast user experience when they are shopping. For Retail operations, Riak KV enables easy capacity increases while yielding a near-linear increase in performance and throughput, reducing operational costs. The database underpins many aspects of the shopping experience with high availability and performance essential to success. Riak KV allows replication of data to multiple data centers, providing both a global data footprint and the ability to survive datacenter failure. The rapidly evolving Retail industry and massive growth in data volumes mean that moving to Riak KV allows you to meet your customer experience and operational cost requirements. Don't wait until the holidays to find out that you can't handle the volume.

“ *Riak is one of those things that just works and doesn't need our attention on a day-to-day basis — saving both time and money. Basho and Riak have exceeded our expectations.* ”

– David Mitchell, ideel's Director of Technical Operators



## ABOUT BASHO TECHNOLOGIES

Basho, the creator of the world's most resilient databases, is dedicated to developing disruptive technology that simplifies enterprises' most critical distributed systems data management challenges. Basho has attracted one of the most talented groups of engineers and technical experts ever assembled devoted exclusively to solving some of the most complex distributed systems challenges presented by Big Data and IoT.

Basho's database, Riak® KV, the industry leading distributed NoSQL database, is used by fast growing Web businesses and by one-third of the Fortune 50 to power their critical Web, mobile and social applications. Built on the same foundation, Basho introduced Riak TS, which is the first enterprise-ready NoSQL database specifically optimized to store, query and analyze time series data. Basho also provides Riak integrations for a variety of Big Data technologies like Apache Spark, Redis, Mesos, and Apache Solr.

For more information visit [Basho.com](http://Basho.com) which is full of interesting use cases, customer case studies and product detail, or [docs.basho.com](http://docs.basho.com) for technical documentation.



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