ObjectRocket for Elasticsearch

Fast, Scalable, Highly Available and Fully Managed

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1. Introducing ObjectRocket for Elasticsearch

Elasticsearch is a flexible and powerful open source, distributed, real-time search and analytics engine. Because it is architected from the ground up for use in distributed environments where reliability and scalability are must-haves, Elasticsearch gives customers the ability to move easily beyond simple full-text search. Through its robust set of APIs and query DSLs, plus clients for the most popular programming languages, Elasticsearch delivers on the promises of current search technology.

However, although Elasticsearch has some proven large-scale deployments like GitHub and Stack Overflow, it's still a relatively new technology. Ensuring the optimal performance and database architecture for a growing Elasticsearch instance requires costly expertise that is often difficult and time-consuming to find and retain. In many cases, developers spend too much time maintaining and troubleshooting the search engine layer, which distracts them from writing code.

ObjectRocket for Elasticsearch is a fully managed hosted Elasticsearch platform. It simplifies application development by offering pre-configured, fully managed, highly performant, highly available Elasticsearch instances, backed 24x7x365 by industry-leading **Fanatical Support®**.

From the infrastructure to the configuration, ObjectRocket for Elasticsearch is tuned specifically for Elasticsearch performance and availability through optimizations like PCIe flash storage and containerization. Rackspace and ObjectRocket specialists help manage your environment, including help with architecture design, optimization and configuration, 24x7x365 monitoring, performance tuning and issue diagnosis — freeing your developers to focus on coding.

By combining purpose-built technology with leading Elasticsearch expertise, the ObjectRocket platform offers:

1. Simplified management
2. Optimal performance
3. High availability and security
4. Easy, powerful scalability
5. Data and application portability

ObjectRocket for Elasticsearch is ideal for customers looking to rapidly deploy full-text search capabilities to new and existing applications while gaining insights from large data sets. It also allows these customers to keep their technical resources focused on activities that truly differentiate their business — like building better apps and improving time-to-market — rather than on maintenance and tuning the search engine layer.

2. Challenges of Managing Elasticsearch

It's easy for many developers to start building applications with Elasticsearch, thanks to its simple RESTful API, which uses JSON. However, maintaining performance and ensuring high availability present increasingly complex challenges as your environment grows.

MANAGING ELASTICSEARCH STRAINS TECHNICAL RESOURCES

Configuring, scaling, maintaining and securing Elasticsearch beyond the initial configuration can be complicated and requires experience and expertise. Developers may spend too much time tuning, patching, monitoring and troubleshooting Elasticsearch performance and rethinking configuration decisions instead of writing code. This can slow time-to-market, decrease application quality and deprive technical contributors of the time they need to pursue new ideas. However, Elasticsearch is still relatively new, and it's difficult and expensive to find engineers with meaningful experience to manage it at scale.

CONFIGURATION AND TUNING MISSTEPS IMPACT PERFORMANCE

With Elasticsearch, there are many index design and configuration options that require specific expertise in order to optimize for performance. For instance, you can optimize the way in which you index data into Elasticsearch or the mapping definition of your index, depending on your search requirements. Failure to optimize for your use-case can result in slower- than-desired performance, which detracts from the benefit of fast searches.

GENERIC PUBLIC CLOUD SERVERS YIELD INCONSISTENT PERFORMANCE

Ensuring fast, consistent search performance is difficult in the public cloud. As with any high CPU-based workload, Elasticsearch's performance is particularly impacted by noisy-neighbor problems. Spikes in multi-tenant utilization not only slow down query speeds, but also make them unpredictable and difficult to code around. As a result, applications that rely on generic public cloud servers experience inconsistent performance.

SCALING BECOMES INCREASINGLY COMPLEX

Although Elasticsearch is built for easy horizontal scaling by simply adding nodes, more complex challenges arise as you scale clusters to much larger sizes. Unless your architecture is completely cloud-native from the start, any architecture will have load inflection points at which it will no longer be able to handle the load.

For instance, Elasticsearch allows you to have multiple shards on a single node. But when you have multiple nodes on your cluster, and multiple shards in the index, the default configuration may lead to unevenly distributed shards. As a result, some nodes will be over-utilized and some under-utilized, causing performance issues as you scale.

3. Benefits of ObjectRocket for Elasticsearch

SIMPLIFIED MANAGEMENT AND ACCESS TO EXPERTISE

In order to ease the burden of managing Elasticsearch, ObjectRocket offers:

i. Hosted Elasticsearch platform fully managed by Rackspace specialists

ii. Automated deployment, scaling and high availability

iii. Multiple easy-to-use interface options

I. FULLY MANAGED ELASTICSEARCH SOLUTION

With ObjectRocket for Elasticsearch, Rackspace Elastic experts and customer data engineers (CDEs) help design, configure, manage, scale, optimize and secure customer Elasticsearch environments. In addition, customers have access to a broad range of services, from schema design to query optimization.

"At any point in time I could pick up the phone and there are people there who will take care of me."

– Shiem Edelbrock
CTO, The Control Group

Examples of services included with ObjectRocket for Elasticsearch:

Deployment	Architecture design, optimization and configuration
	Initial design and construction of indexes
	Free data migration assistance
	Security configuration (ACL, accounts, etc.)
Maintenance and support	Advanced administration, monitoring and alerting
	Configuration management
	Managed patching and updates
	Upgrades of Elasticsearch versions
	UI support
	Performance tuning and issue diagnosis
Scaling	Consultation and recommendations on number of shards and replicas per index
	Provisioning new instances
	Resizing and/or growing instances
Optimization	Performance tuning and issue diagnosis
Backups and DR	Disaster recovery (DR) and business continuity
	Recommend and plan replication to DR site
	Participate in DNS management for failover to DR site
	Participate in DR RTO/RPO requirements
	Restores from backups

II. AUTOMATED DEPLOYMENT, SCALING AND HIGH AVAILABILITY

The ObjectRocket platform includes a range of back-end and customer-facing tools that simplify the management of Elasticsearch, saving customers time and allowing them to deploy and scale faster.

Automated replication – When a customer spins up a Elasticsearch instance, they will receive two data nodes with the number of replicas per index set to 1 by default.

Automated deployment – Provision Elasticsearch in just a few clicks.

III. MULTIPLE INTERFACE OPTIONS

ObjectRocket offers several easy-to-use methods for users to interface with the platform:

- Control panel – A graphical user interface (GUI) that includes visual indicators for space usage breakdown across clusters, shard balance and more.
- API – ObjectRocket for Elasticsearch supports standard Elasticsearch RESTful and Java APIs and UI access via the ElasticHQ and elasticsearch-head plugins.

OPTIMIZED ELASTICSEARCH PERFORMANCE

Every aspect of the ObjectRocket stack has been tuned specifically to make Elasticsearch run fast — from infrastructure to configuration.

As a result, ObjectRocket relieves the inconsistencies that users typically experience when running search engines like Elasticsearch on generic public cloud servers. By increasing queries-per-second and enabling fast, predictable performance, customers can deliver a better, more consistent experience to end users.

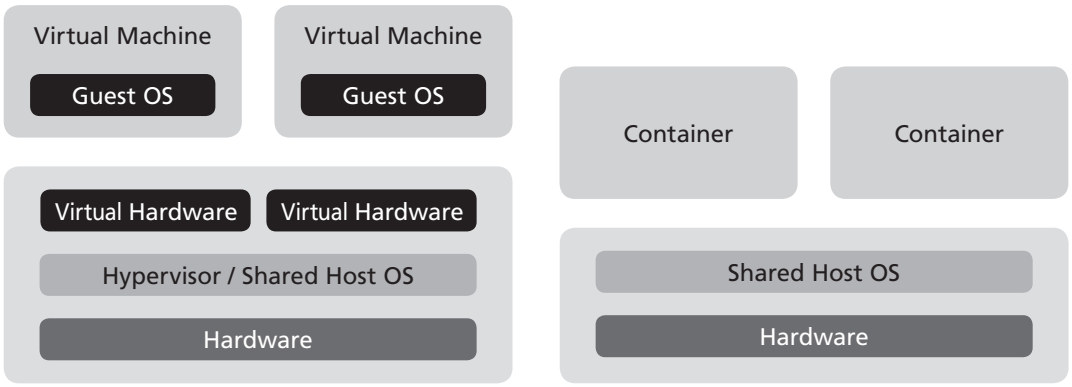
ALL-PCIe FLASH INFRASTRUCTURE PURPOSE-BUILT FOR ELASTICSEARCH

ObjectRocket is built on all-PCIe flash-based infrastructure. As a result, the entire platform utilizes a highly performant I/O subsystem ideally suited for Elasticsearch, leading to increased speed and improved consistency — especially for applications that need to write and re-index frequently.

CONTAINER-BASED VIRTUALIZATION

In addition, ObjectRocket's physically separate systems employ a containerized approach to isolate CPU, memory and I/O resources, which yields additional performance improvements. Traditional hardware virtualization — with virtualized memory, processor and hard drives — is not optimal for high CPU workloads like Elasticsearch. The overhead of running multiple operating systems (often described as "the hypervisor tax") imposes penalties that especially impact search engine workloads. Conversely, container-based virtualization provides close-to-native performance, eliminating the need for virtualized hardware and multiple operating systems, and facilitating higher density.

Traditional Hardware Virtualization vs. Container-Based Virtualization



ENSURED HIGH AVAILABILITY AND STABILITY

ObjectRocket for Elasticsearch helps you minimize service disruptions with a platform preconfigured for high availability and backed by world-class uptime SLA guarantees. You get a robust and resilient architecture with monitoring, backups and 24x7x365 **Fanatical Support®** to preempt and solve problems.

- **Full redundancy** – You get infrastructure redundancy from the network all the way up the stack.
- **Security** – Manage access with an integrated firewall and access control list (ACL). Instances terminate both plain text and SSL client traffic.
- **Industry-leading SLAs** – Find complete SLA info here: http://objectrocket.com/sla

EASY, POWERFUL SCALABILITY

Every offering on the Object Rocket platform is meant to scale seamlessly to meet the demands of your data.

Elasticsearch's distributed architecture allows you to scale horizontally by simply adding machines. Users can size and grow their clusters while remaining confident that they can adapt to future needs.

In addition, Rackspace and ObjectRocket specialists are available to help you solve complex scalability challenges in order to prepare for rapid long-term growth or handle usage spikes.

"Scalability with ObjectRocket means we actually hit our milestones. They've grown with us as fast as we can, and they've made this process seamless. Beforehand we were onboarding clusters day in and day out. That's all been offboarded to Rackspace, and it's just invisible success."

– Dane Atkinson
CEO, SumAll

DATA AND APPLICATION PORTABILITY

The ObjectRocket platform is built on open standards and includes integrations to ensure data and application portability. Because it utilizes an Elasticsearch open source Apache License, your data is always portable, with no threat of database vendor lock-in.

ObjectRocket for Elasticsearch allows you to run your application layer anywhere, giving you additional flexibility when it comes to hosting options. In addition, the platform supports both RackConnect and AWS Direct Connect, so you can minimize the impact of latency while running applications at Rackspace or AWS data centers, respectively.

Monthly Availablitly %	% of monthy bill credits
99.0% – < 99.95%	5%
95.00% – < 99.00%	25%
< 95%	50%

Service credits ensure developers are reimbursed for any possibility of downtime

4. ObjectRocket vs. Unmanaged Hosting

	Unmanaged	ObjectRocket
Deployment Options	Public cloud with generic commodity servers	• Every aspect of the ObjectRocket stack has been tuned specifically to make Elasticsearch run fast—from infrastructure to configuration.
Deployment Process	Manual deployment: • Manual installation • Manual configuration of Elasticsearch, OS, networking, security, monitoring and more • Manual testing and optimization with a tradeoff between rapid deployment and future scalability	• 3-click deployment
Performance	• Lower performance on generic commodity servers not optimized for high-CPU search engine workloads • Noisy neighbor problems on public cloud create inconsistency • Must invest in-house technical resources to tune and optimize architecture, etc.	• Every aspect of the ObjectRocket stack has been tuned specifically to make Elasticsearch run fast • PCIe flash-based infrastructure • Containerized virtualization
Scaling	Manual scaling: You're on your own for unique challenges and spikes	• Elasticsearch engineers are on-hand for scaling, unique challenges and spikes
Monitoring	You allocate resources to monitor performance, security, etc.	ObjectRocket's Elasticsearch experts proactively monitor the network, server and Elasticsearch 24x7x365
Availability	Manual high availability (HA) • You're on your own for HA • No SLAs • Issues such as network inconsistency can impact automatic failover	Automatic high availability and backups • Automatic high availability • Industry-leading SLAs • Fully redundant infrastructure, from the network all the way up the stack

5. Common Use Cases

As a generic, scalable and developer-friendly search engine, Elasticsearch has an enormous range of practical applications across many industries. Generally speaking, the ObjectRocket for Elasticsearch platform is especially well suited for businesses that want to address these use cases while simultaneously keeping technical teams lean and focused in order to improve time-to-market and cost effectiveness.

Example use cases include:

CONTENT MANAGEMENT AND DELIVERY

Elasticsearch can enable media companies and marketers to identify key trends from aggregated content performance data. By understanding which pieces, topics and content types are most successful, they can improve the relevance and effectiveness of their content. With Rackspace and ObjectRocket handling tasks like instance configuration, tuning and patching, businesses can take advantage of these insights without having to hire additional engineers or allocate existing resources to managing Elasticsearch.

MOBILE AND SOCIAL APPS

Elasticsearch can solve many use cases related to mobile and social apps, such as searching for restaurants or products in a review app, or for specific users, topics or groups in a social media app. For these businesses, ObjectRocket's robust SLAs, access to Fanatical Support and Elasticsearch instances preconfigured for high availability help them maintain the always-on user experience that today's users have come to expect from mobile and social apps.

ECOMMERCE

Elasticsearch has a wide range of ecommerce applications, from product search features to analytics use cases, which allow teams to drill down into visitor metadata to better understand customer behavior. As a fully managed platform, ObjectRocket ensures that ecommerce businesses are free to focus their technical resources on improving their website and ensuring a positive customer experience, rather than managing and troubleshooting Elasticsearch. In addition to Elasticsearch's proven scalability, these customers have access to guidance from Rackspace experts for help preparing their online store for massive traffic events like the holiday shopping season.

FINANCIAL SERVICES

Elasticsearch enables companies in the financial industry to extract insights from structured and unstructured data — ranging from financial transactions to customer claims — which, in turn, enables them to mitigate risk, anticipate opportunities and detect fraud. ObjectRocket for Elasticsearch provides them a highly secure platform to help safeguard customers' financial data, with Rackspace experts to handle security configuration and proactive patching.

6. Conclusion

For customers seeking a highly performant, scalable, fully managed Elasticsearch solution, ObjectRocket for Elasticsearch is the ideal choice. The ObjectRocket platform allows customers to optimize their search engine for speed and scalability while simultaneously focusing their technical resources on activities that truly differentiate their business.

To learn more about ObjectRocket for Elasticsearch, contact a specialist at **1-844-208-1147** or visit **www.objectrocket.com/elasticsearch/**

About Rackspace

Rackspace (NYSE: RAX)is the #1 managed cloud company. Its technical expertise and **Fanatical Support®** allow companies to tap the power of the cloud without the pain of hiring experts in dozens of complex technologies. Rackspace is also the leader in hybrid cloud, giving each customer the best fit for its unique needs — whether on single- or multi-tenant servers, or a combination of those platforms. Rackspace is the founder of OpenStack®, the open-source operating system for the cloud. Based in San Antonio, Rackspace serves more than 200,000 business customers from data centers on four continents.

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