Overcoming Inconsistent Public Cloud Performance

How Databarracks Delivers Guaranteed I/O Performance in its Multi-Tenant Public Cloud

Prepared For:

Databarracks

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Cloud Computing Benefits and Challenges

Cloud providers have struggled to deliver a consistent cloud hosting experience due to the shared, multi-tenant nature of early cloud architectures. In contrast, the recently launched Databarracks cloud is architected to deliver a guaranteed level of performance to all of its customer's applications.

Most public clouds fall short when it comes to delivering a consistent and predictable level of performance. This is problematic for I/O intensive workloads and latency sensitive applications such as large databases. Ultimately, inconsistent performance leads to business issues including decline in competitive position, customer churn, lost revenue and higher IT costs.

"Most public clouds fall short when it comes to delivering a consistent and predictable level of performance."

Consistent cloud performance has become a key factor in choosing a cloud provider. To better understand differences in consistency among public clouds, Neovise and Cloud Spectator have partnered to complete performance testing and analysis on cloud services offered by Databarracks and Rackspace. Based on the results of our research, Databarracks delivers a more consistent and predictable cloud hosting experience to its customers. The following data outlines the testing methodology and the data that supports these conclusions.

Measuring Performance Consistency

The tests used to measure performance in these cloud environments were run for 15 consecutive days from June 5, 2013 until June 19, 2013, and focused primarily on I/O performance.

Disk I/O using SysBench

SysBench was used to measure disk I/O performance with a large number of parallel requests. As shown in the graph on page 3, Databarracks significantly outperformed Rackspace in both overall performance and consistency. In terms of overall or raw performance, it took Databarracks 77.1 seconds on average to perform the requested I/O, and 177.7 seconds for Rackspace. This means that Databarracks' processed the I/O requests 230% faster than Rackspace. In terms of performance consistency, Databarracks scored consistently with Rackspace, with a relative standard deviation of 6% from the average score.

Disk Reads and Writes (without cache), using Mongoperf

Mongoperf was used to measure disk I/O performance of the cloud servers. For the tests in this report, random reads and writes were forced to access disk, eliminating the performance benefits of RAM as a cache and providing the most accurate assessment of disk performance alone.

The graphs on pages 4 and 5 demonstrate that Databarracks outperforms Rackspace in both overall performance and consistency. In terms of overall or raw performance, Databarracks' basic cloud offering is 1,702% faster than the Rackspace basic cloud offering. Databarracks's read result was 14,669.5 operations per second, compared to Rackspace that offered just 626.6 operations per second. In terms of performance consistency, Databarracks had a relative standard deviation of 3% while Rackspace exhibited a relative standard deviation of 20%, or about 6.7 times that of Databarracks. While Databarracks's write operations scored 1,063% better than Rackspace's server, the relative standard deviation was much more comparable at 11% and 12%, respectively.

Explaining the Results

Relative to other cloud offerings, the high level of performance and consistency demonstrated by Databarracks is compelling. An additional benefit that may not be so obvious in the results stems from how Databarracks delivers this level of consistency. By providing guaranteed provisioned IOPS for each virtual machine (VM), users are immune to the affects of storage access by any other users in the system. As a result, the "Noisy Neighbor" issue – where intensive I/O by a user or "neighbor" degrades I/O performance of other tenants – does not occur at Databarracks.

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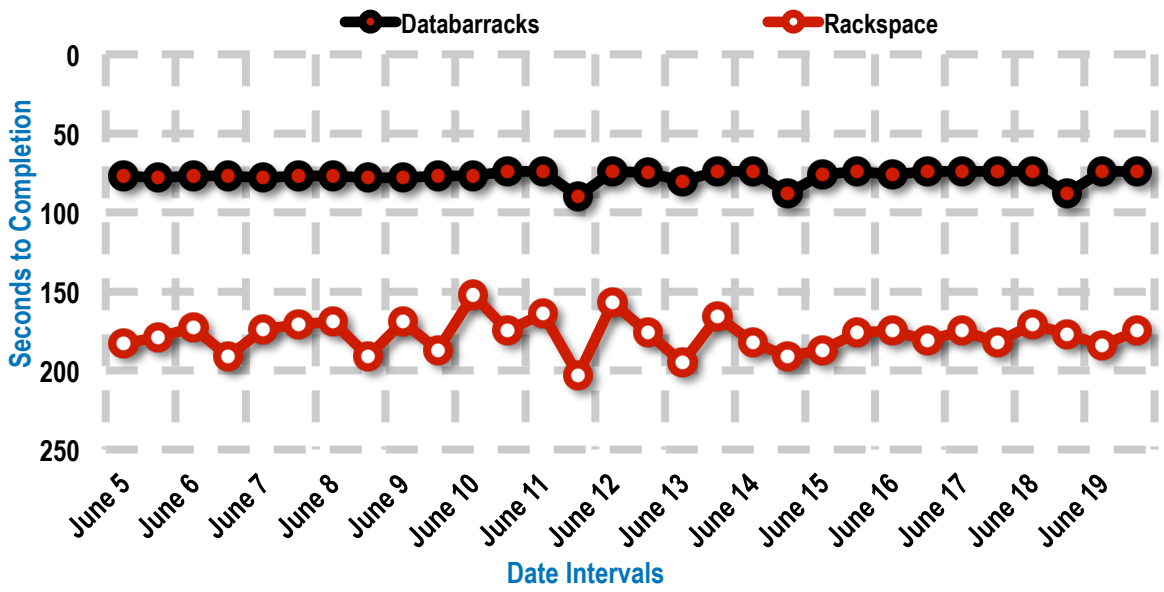
Databarracks built its cloud on a scale-out, all-SSD storage system from SolidFire, built specifically to enable guaranteed quality of service to thousands of applications at cloud scale. Rather than simply boosting average or peak I/O performance like typical SSD solutions, SolidFire developed an end-to-end storage architecture designed specifically for multi-tenant public cloud environments. This enables Databarracks to deliver guaranteed performance, allowing I/O sensitive applications and databases to achieve extreme levels of performance and users to receive a consistent and predictable level of service.

SysBench Benchmark



Seconds to Complete	Databarracks	Rackspace
Average	77 .1	177.7
15-day High	90	203
15-day Low	74	152
% Deviation from Average	6%	6%

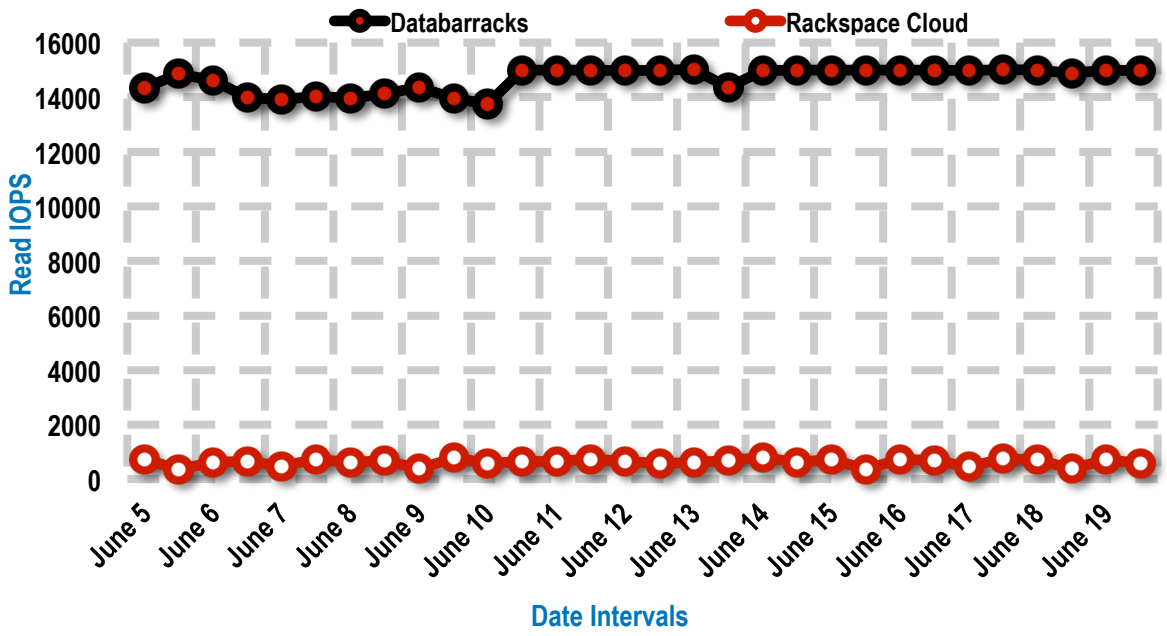
Test Description

Sysbench is used to evaluate servers by simulating a database running under intensive load. It is primarily used in the industry for MySQL benchmarking. The test in this table is a Sysbench run to evaluate file I/O with 32 threads, all running in parallel. With the results, Sysbench times the seconds until completion of the benchmark, so a lower score in seconds represents a higher efficiency for a database server.

Test Parameters:

```
sysbench --test=fileio --file-total-size=2G --num-threads=32 prepare
sysbench --test=fileio --file-total-size=2G --file-test-mode=rndrw --max-
      requests=1000000 --num-threads=32 run
sysbench --test=fileio --file-total-size=2G cleanup
```

Mongoperf Reads, without Cache



Read IOPS	Databarracks	Rackspace
Average	14669.5	626.6
15-day High	15024	815
15-day Low	13751	363
% Deviation from Average	3%	20%

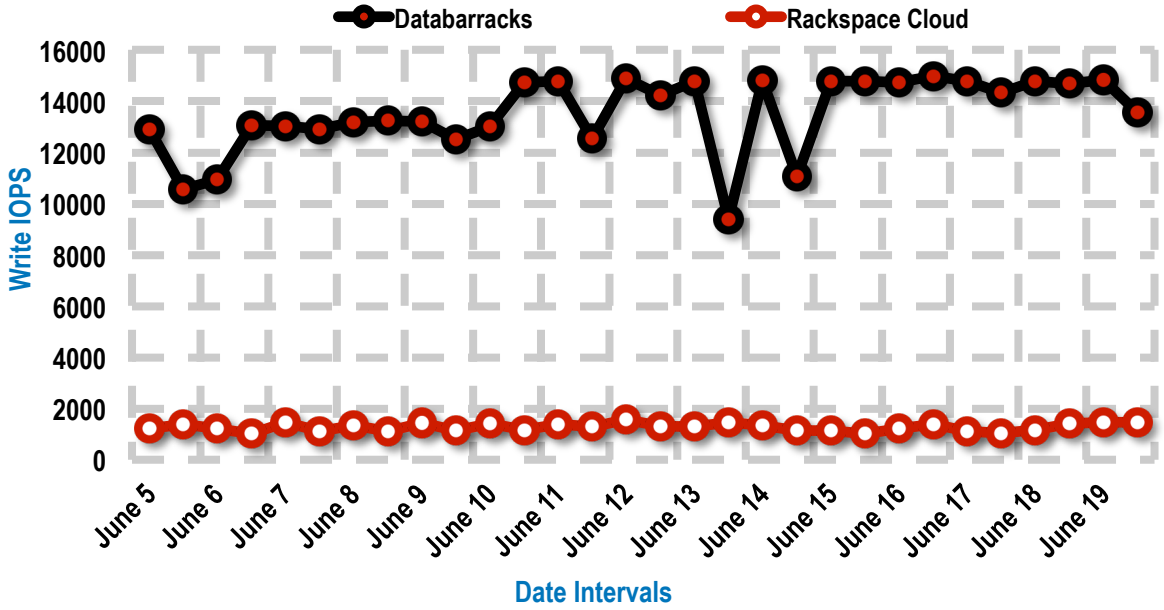
Description

Mongoperf checks disk I/O performance independently of MongoDB, though the application comes with the installation of MongoDB. Mongoperf was run without any caching that might increase the I/O results, which would give an unrepresentative sample of disk performance. The test above isolates read performance.

Test Parameters:

```
nThreads:32, fileSizeMB:2000, mmf:false, r:true, w:false, recSize:4, syncDelay:1
```

Mongoperf Writes, without Cache



Write IOPS	Databarracks	Rackspace
Average	13538.53	1273.13
15-day High	14986	1237
15-day Low	9399	1009
% Deviation from Average	11%	12%

Description

Mongoperf checks disk I/O performance independently of MongoDB, though the application comes with the installation of MongoDB. Mongoperf was run without any caching that might increase the I/O results, which would give an unrepresentative sample of disk performance. The test above isolates write performance.

Test Parameters:

```
nThreads:32, fileSizeMB:2000, mmf:false, r:false, w:true, recSize:4, syncDelay:1
```

About the Test

For this testing effort we compared the base cloud offerings of Rackspace and Databarracks.

Rackspace Public Cloud IaaS
2 vCPUs
4GB RAM
160GB Disk

Databarracks IaaS
2 vCPUs
4GB RAM
50GB Disk

Tests were automated to run 3 times a day over 15 days using a limited version of Cloud Spectator's CloudSpecs application, which runs a series of CPU, disk, RAM, network, and application tests automated across providers. Only tests designed to measure disk I/O were included in the measurements.

About Databarracks

Established in 2003, Databarracks was one of the UK's first providers of managed backup and disaster recovery services. It has since grown rapidly to become one of the most technologically advanced innovators in infrastructure services, delivering solutions to companies of all sizes and complexities from UK-based, ex-military data centres.

Learn more: www.databarracks.com | www.twitter.com/databarracks | 0800-033-6633

About SolidFire

SolidFire delivers storage solutions that enable cloud providers to advance the way the world uses the cloud. Our scale-out, all-SSD storage system is built specifically to enable guaranteed quality of service to thousands of applications at cloud scale. By delivering high-performance storage with incredible efficiency and total management automation, SolidFire is fueling new opportunities in the cloud.

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About Cloud Spectator

Cloud Spectator is the premier cloud analyst group focused on infrastructure pricing and server performance. Since 2011, Cloud Spectator has monitored the cloud Infrastructure industry on a global scale and continues to produce research reports for businesses to make informed purchase decisions by leveraging its CloudSpecs utility, an application that automates live server performance tests 4 times a day, 365 days a year with use of open source benchmark tests. The data is compared relatively with pricing from each provider to allow business decision-makers to smart decisions.

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About Neovise

Based on independent research and analysis, Neovise delivers essential knowledge and guidance to cloud-related technology vendors, service providers and systems integrators, as well as business and IT organizations that purchase and use cloud-related services and technology. Our offerings include research, advisory and collateral development services that help our customers—and their customers—make optimal decisions and formulate winning strategies. Research. Analyze. Neovise.

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