Validating Object Storage Performance

Object Storage is the backbone of large scale and highly distributed cloud storage solutions. The classic use cases include backup and archive, rich media, and content distribution.

But objects have to be manipulated as a whole unit, requiring the entire object to be accessed, updated, then re-written in its entirety. That can have performance implications. In the past, applications with stringent performance QoS requirements have not been a good fit for object storage.

But a new generation of vendors claim to solve or mitigate the performance limitations of object storage. They position it for a variety of cloud and big data workloads. With so many vendors offering varying degrees of maturity offerings, how can you test or validate object storage performance? Unlike established storage technologies like File and Block, there are not years of "rules of thumb" knowledge to apply to these new offerings.

> Aggregation of results is our enemy. With Virtual Instruments we can trace, track, and compare anything – all the protocol-level details we want."
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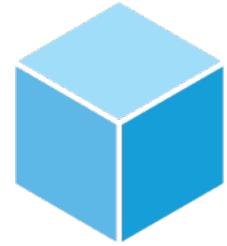> Steve Downer, Director of Test Engineering
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> Oracle

Virtual Instruments is leading the industry with the most comprehensive coverage of object storage infrastructure performance assessment. The Virtual Instruments Object Storage performance validation solution provides coverage for three widely supported object storage protocols – Amazon S3, OpenStack Swift, and SNIA CDMI.

The Virtual Instruments Object Storage performance validation solution is designed to assess the maximum capacity and speed of object storage infrastructures, servers and arrays. Virtual Instruments accomplishes this by emulating up to millions of S3, Swift, and CDMI clients generating highly stressful and realistic requests to the servers.

We then measure the performance, scalability, and response times of the servers in handling these requests, and verify the integrity of the stored objects' contents. In addition, the user is provided with the ability to fine tune the definition of the HTTP request header and request body of each request, as well as content-encoding and transfer-encoding controls, giving users the ability to simulate a huge variety of object storage clients.

Virtual Instruments Object Storage Testing and Validation Features

- Pre-built spec-compliant commands for service, bucket / container, and object operations
- Authentication schemes
- Create and customize metadata key-value pairs

- KPI charts to assess throughput, IOPS, response time and scalability of servers

- Dedicated statistics for each object storage protocol command

- HTTP layer and TCP layer statistics and error tracking

- Customizable HTTP Request Header fields, Request Body fields
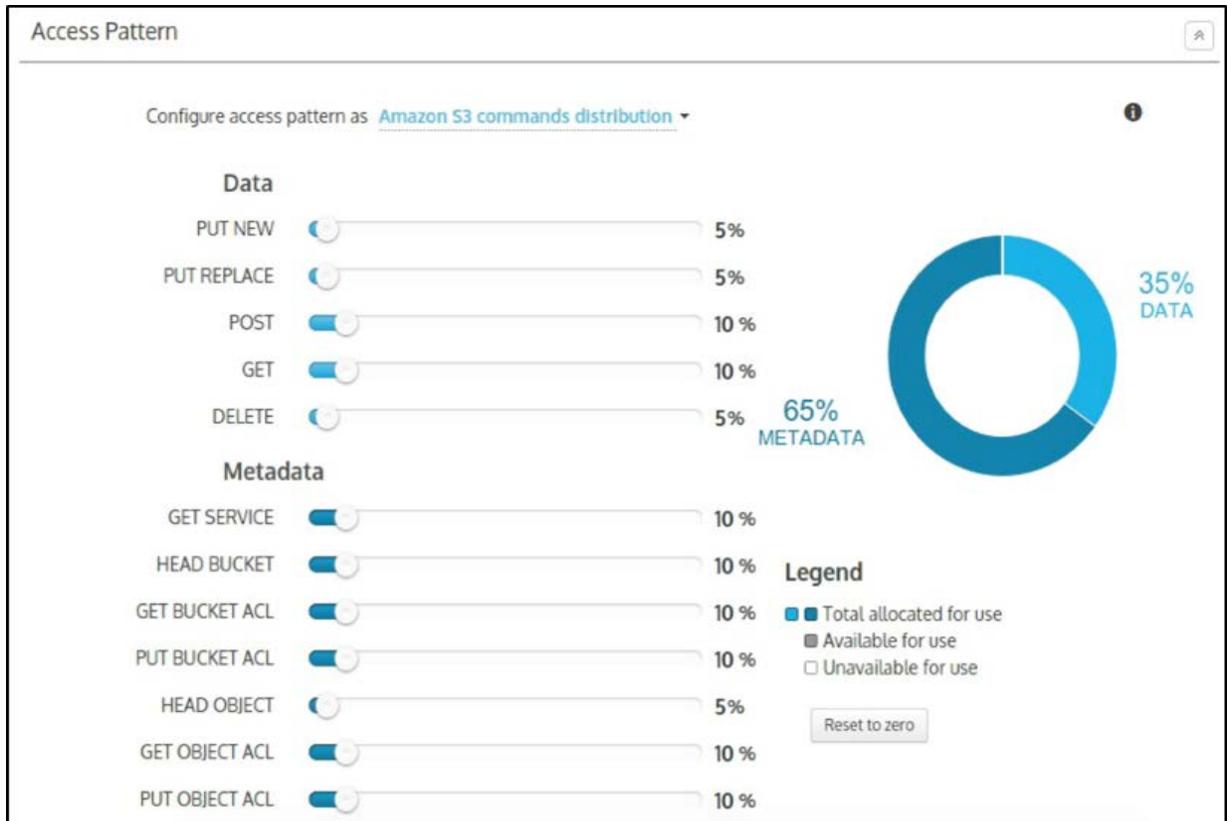
- Data content verification

Figure1: Sample screen capture ... access pattern input screen for Amazon S3 commands distribution