How Many IOPS is Enough?

Coughlin Associates

Data Storage Consulting

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October 2016

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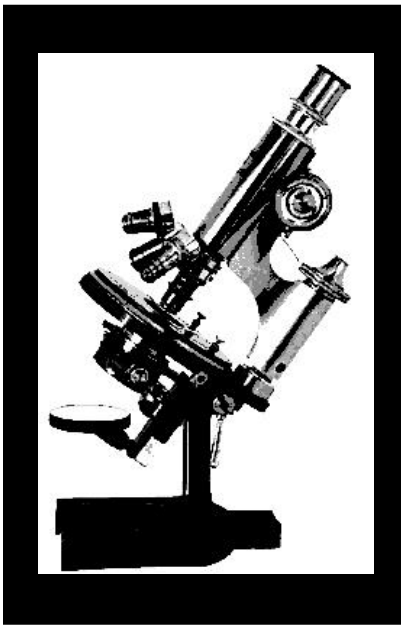
HOW MANY IOPS IS ENOUGH?
A JOINT REPORT



Coughlin Associates

JIM HANDY, OBJECTIVE ANALYSIS
TOM COUGHLIN, COUGHLIN ASSOCIATES

October 2016

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EXECUTIVE SUMMARY

This report details the results of a months-long storage performance survey performed by Coughlin Associates and Objective Analysis through the first half of 2016 compared to earlier responses to the same set of survey questions in 2012.

The survey asked over two hundred sixty respondents to share their high-speed storage capacity and performance needs, IOPS and maximum latency, along with the speed of the rest of their system and for the application type being run on that system.

Data is presented in three graphical formats:

- A pie chart to display the survey population
- Column charts indicating the percentage of respondents falling into various categories (Pareto Charts)
- Scatter charts to help identify the relationship between the different parameters that were measured.

In an effort to determine how perceptions have changed over time, this data is presented for 2012 alone (as it appeared in our original report), through 2016, and with the newer responses broken out by themselves and compared with the older data.

The following results were found:

- The majority of our survey respondents required fast storage for the following application types:
    - Database
    - On-Line Transaction Processing (OLTP)
    - Cloud and Storage Services
    - Scientific and Engineering Computing
- Those survey responses that changed between 2012 and 2016 generally represented increases in both speed and capacity and reductions in expected latency.
- Most respondents (79%) required performance of over 1,000 but fewer than ten million IOPS over a broad range of capacities
- Latency requirements had a very solid peak with 32% requiring 10 milliseconds.
- In many cases there was a reasonable correlation between two of the surveyed parameters:
    - Capacity & IOPS requirements
    - Capacity & Maximum Latency
    - IOPS Requirements and Maximum Latency
- The sample group was a respectable size, giving us a 6.0% margin of error at a 95% confidence level. We continue to collect survey data with a goal of increasing the respondent base and reducing the error margin.

- Storage pricing is loosely tied to performance. This relationship is likely to tighten as a result of this survey and as those who purchase fast storage become more sophisticated.

FIGURES

TABLES

AUTHORS

Jim Handy

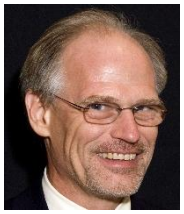
Jim Handy, a widely recognized semiconductor analyst, comes to Objective Analysis with over 30 years in the electronics industry including 14 years as an industry analyst for Dataquest (now Gartner) and Semico Research. His background includes marketing and design positions at market-leading suppliers including Intel, National Semiconductor, and Infineon.

A frequent presenter at trade shows, Mr. Handy is known for his widespread industry presence and volume of publication. He has written hundreds of articles for trade journals, Dataquest, Semico, and other prior employers, and is frequently interviewed and quoted in the electronics trade press and other media. Mr. Handy writes the Chip Talk blog for Forbes online and contributes to two Objective Analysis blogs: The SSD Guy and The Memory Guy.

Mr. Handy has a strong technical leaning, with a Bachelor's degree in Electrical Engineering from Georgia Tech, and is a patent holder in the field of cache memory design. He is the author of "The Cache Memory Book" (Harcourt Brace, 1993), the leading reference in the field. Handy also holds an MBA degree from the University of Phoenix. He has performed rigorous technical analysis on the economics of memory manufacturing and sales, discrediting some widely held theories while unveiling other true motivators of market behavior.

Mr. Handy may be contacted at Jim.Handy@Objective-Analysis.com, or by telephone at +1 (408) 356-2549.

Tom Coughlin



Tom Coughlin, President, Coughlin Associates is a widely respected storage analyst and consultant. He has over 39 years in the data storage industry with multiple engineering and management positions at high profile companies.

Dr. Coughlin has many publications and six patents to his credit. Tom is also the author of ***Digital Storage in Consumer Electronics: The Essential Guide***, which was published by Newnes Press. Coughlin Associates provides market and technology analysis (including reports on several digital storage technologies and applications such as professional media and entertainment, and a newsletter) as well as Data Storage Technical Consulting services.

Tom is active with SMPTE, SNIA, the IEEE Magnetics Society, IEEE CE Society, and other professional organizations. Tom is the founder and organizer of the Annual Storage Visions Conference (www.storagevisions.com) as well as the Creative Storage Conference (www.creativestorage.org). Tom is also the general chairman of the annual Flash Memory Summit. He is a Leader in the Gerson Lehrman Group Councils of Advisors and a member of the Consultants Network of Silicon Valley (CNSV). For more information go to www.tomcoughlin.com or call Tom at 408-202-5098.

Coughlin Associates
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OBJECTIVE ANALYSIS
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A COMPELLING REPORT BY COUGHLIN ASSOCIATES & OBJECTIVE ANALYSIS

HOW MANY IOPS DO YOU REALLY NEED?

NEW REPORT DETAILS PERFORMANCE NEEDS FROM IT MANAGER SURVEY

Do you really need the performance of an SSD? How much should a performance SSD cost? What have other IT managers found to be the right balance of performance and cost? Many find it difficult to determine which SSD or flash array to buy or even whether they can get the speed they need from standard HDDs.

Modern storage systems offer a dizzying rage of IOPS (from hundreds to millions), latencies, and capacities. This report probes these questions to yield considerable insight into these issues. By surveying over 180 IT managers and end users, Coughlin Associates and Objective Analysis have gained a deep understanding of the performance, capacity, and cost requirements of various applications including IOPS and latency, all of which are all spelled out graphically in this thorough report.

The results of this ongoing survey are revealing. Some applications have more rigid requirements than others, with needs varying according to the type of application. Since the survey (TinyURL.com/IOPSsurvey) is ongoing, this report will be updated in the future.

Order Today!

This report can be ordered online for immediate download at www.Objective-Analysis.com, or via email or fax using the form below.

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