Storage Performance Benchmarking: Introduction and Fundamentals

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Mark Rogov / EMC

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R&D Engineer

@drjmetz

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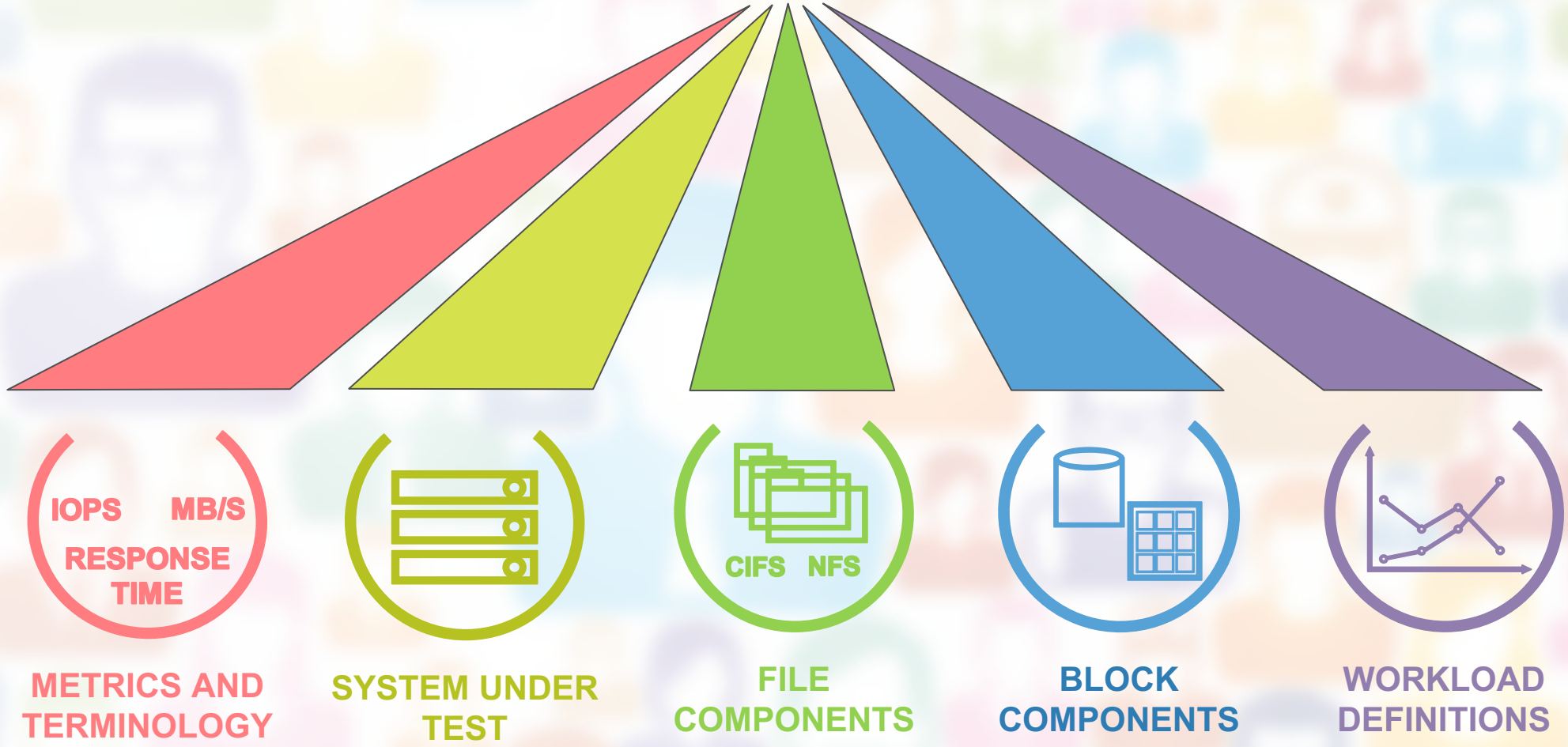
Storage Performance Benchmarking



Storage Performance Benchmarking

INTRO BLOCK FILE GRAPH

Three Great Buckets Of Testing

BUSINESS

RUN PRODUCTION APPLICATIONS

DATABASE
COMPUTE FARM
VDI

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Three Great Buckets Of Testing

BAKE-OFFS

SINGLE OBSCURE METRIC

UN*X DD
IOMETER
IOZONE
VDBENCH

BUSINESS

RUN PRODUCTION APPLICATIONS

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Three Great Buckets Of Testing

BAKE-OFFS

SINGLE OBSCURE METRIC

UN*X DD
IOMETER
IOZONE
VDBENCH

BENCHMARKS

BALANCED PROFESSIONAL APPROACH

SPEC SFS
SPC1

LOGIN VSI
VMMARK

BUSINESS

RUN PRODUCTION APPLICATIONS

DATABASE
COMPUTE FARM
VDI

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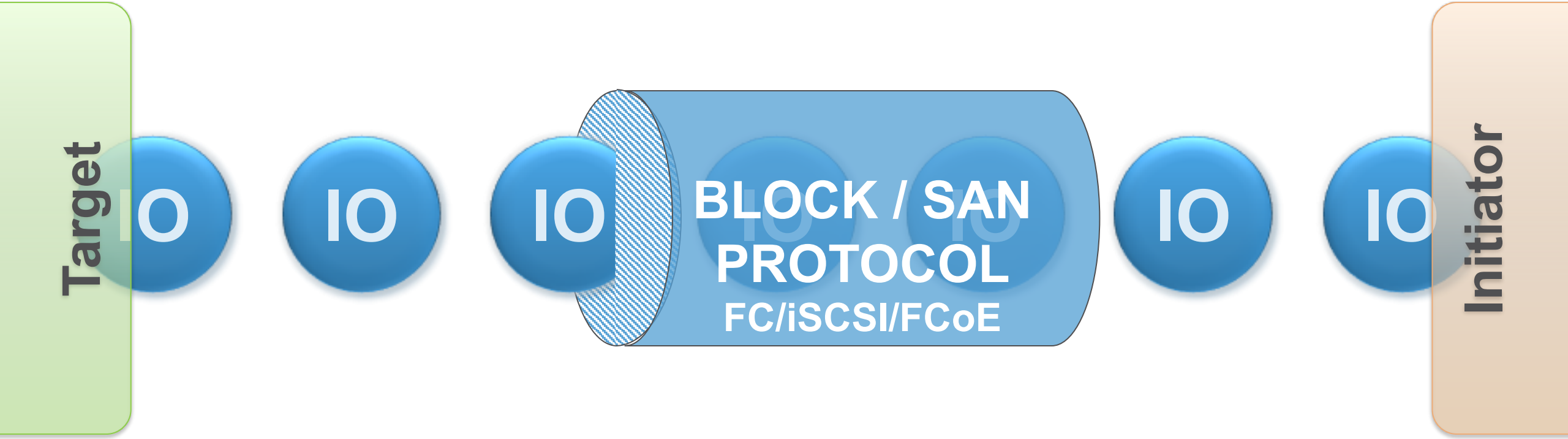
Block / SAN Terminology



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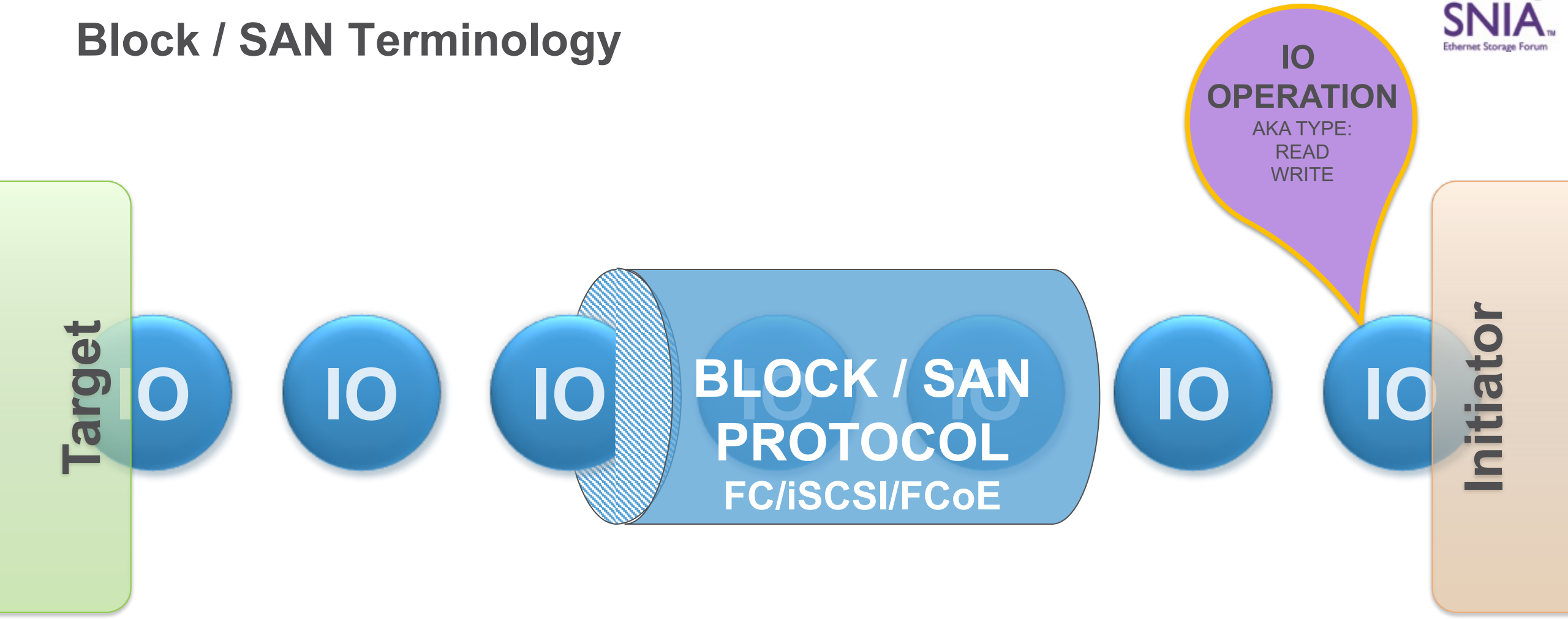
Block / SAN Terminology



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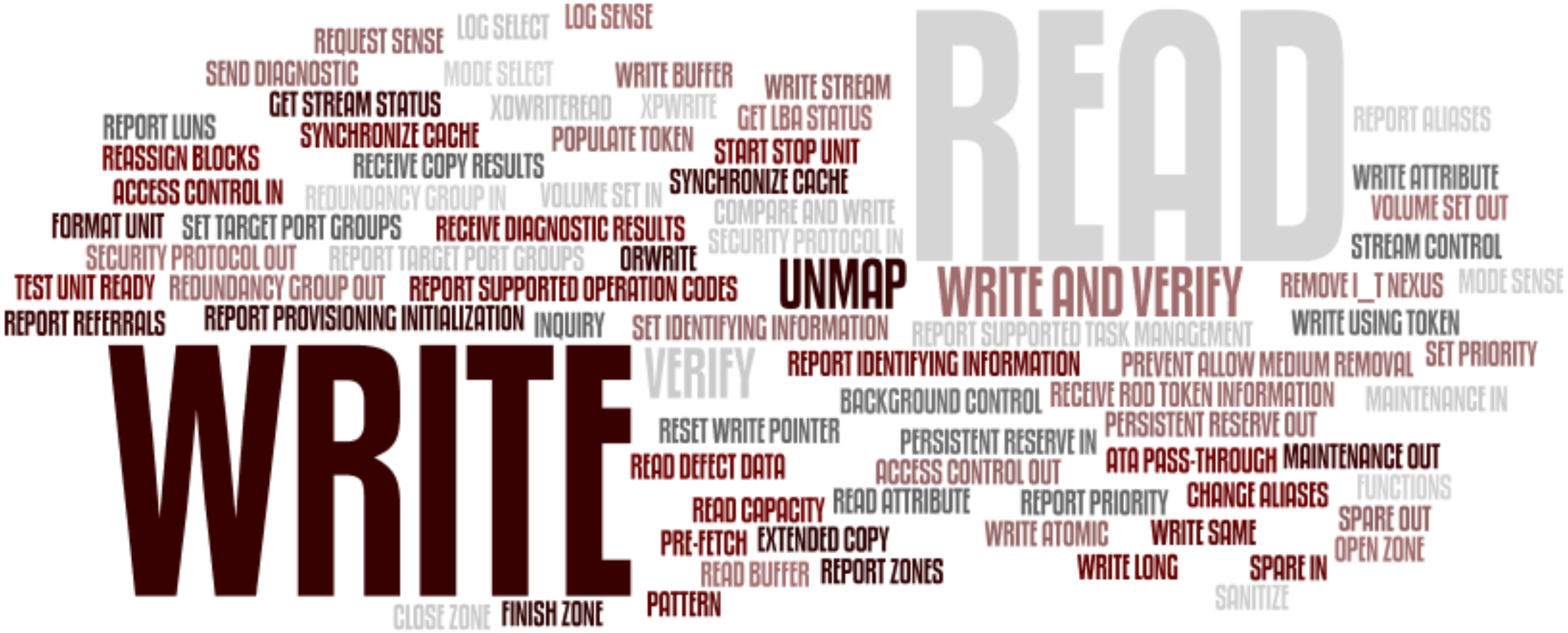
Block / SAN Operations



Source: http://www.t10.org/cgi-bin/ac.pl?t=f&f=sbc4r07c.pdf
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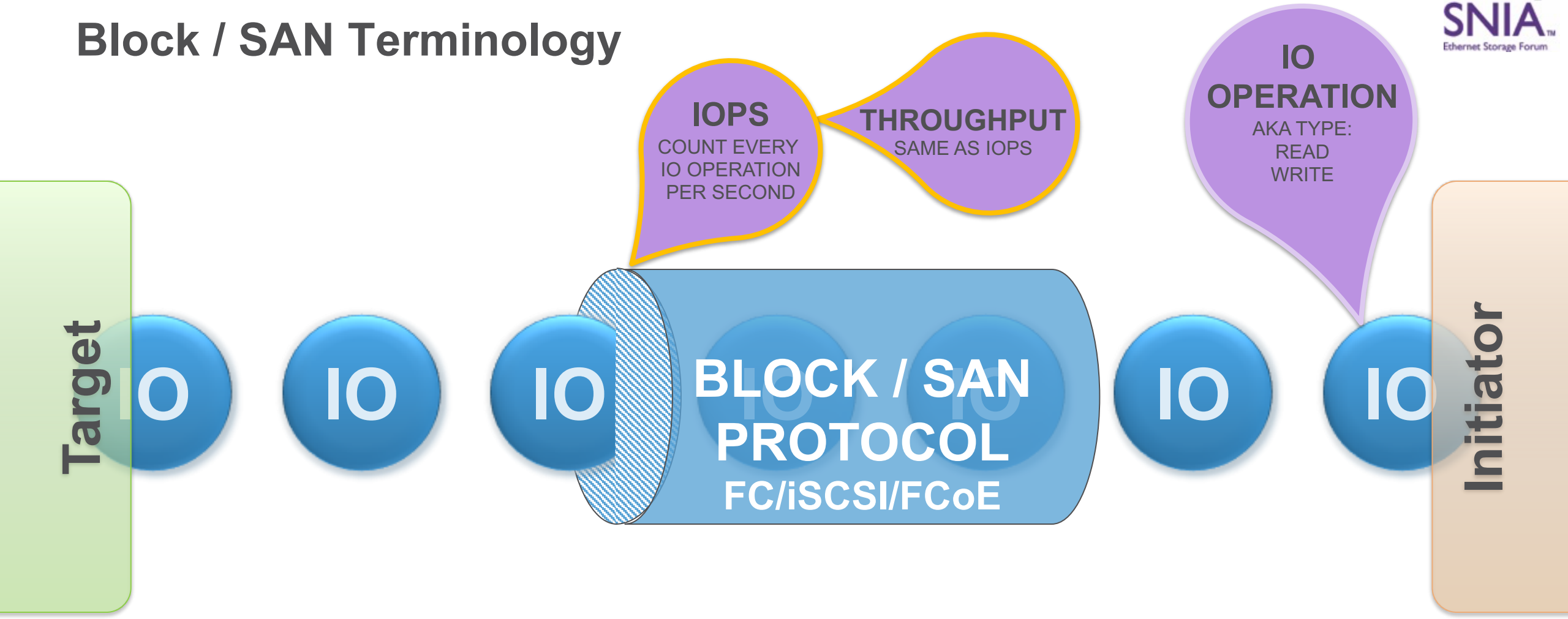
Block / SAN Terminology



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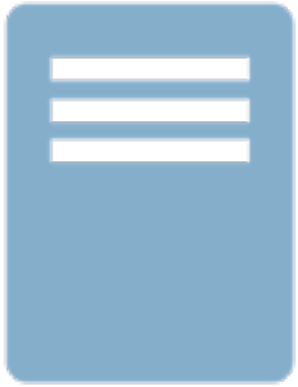
Where To Measure IOPS?

DISK DRIVES

STORAGE CONTROLLER

HOSTS



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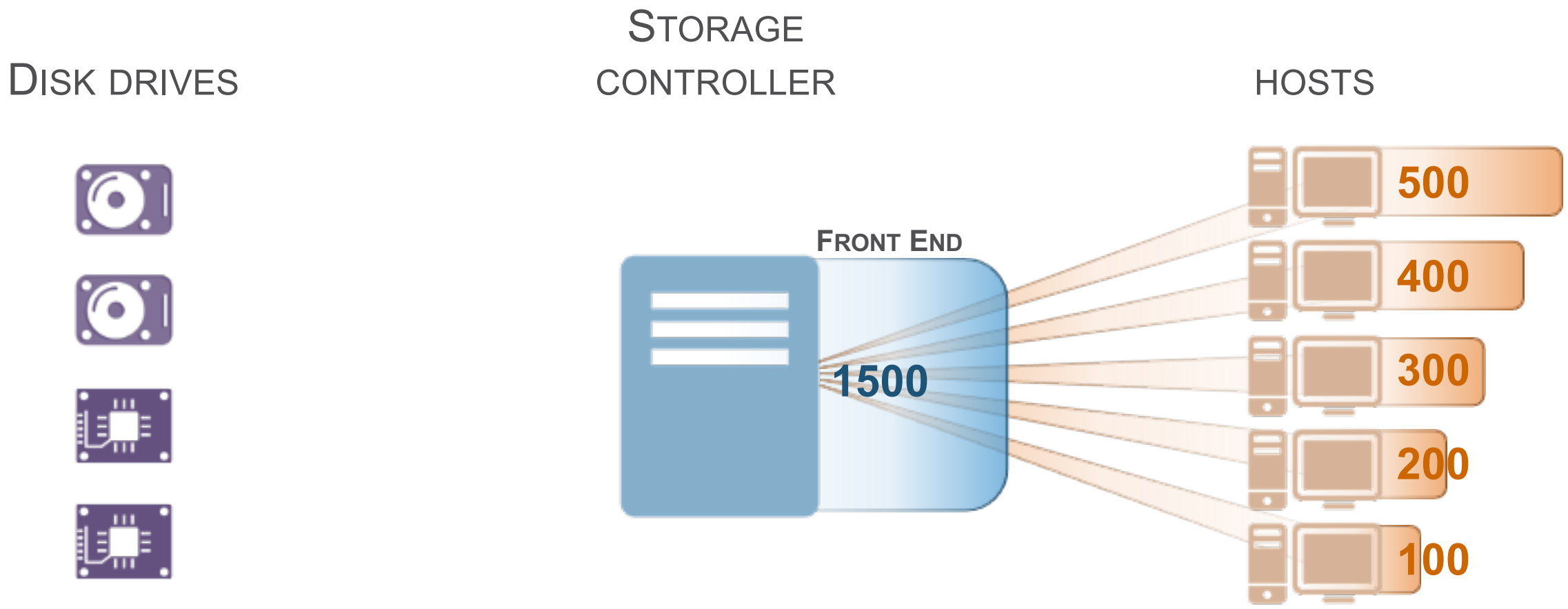

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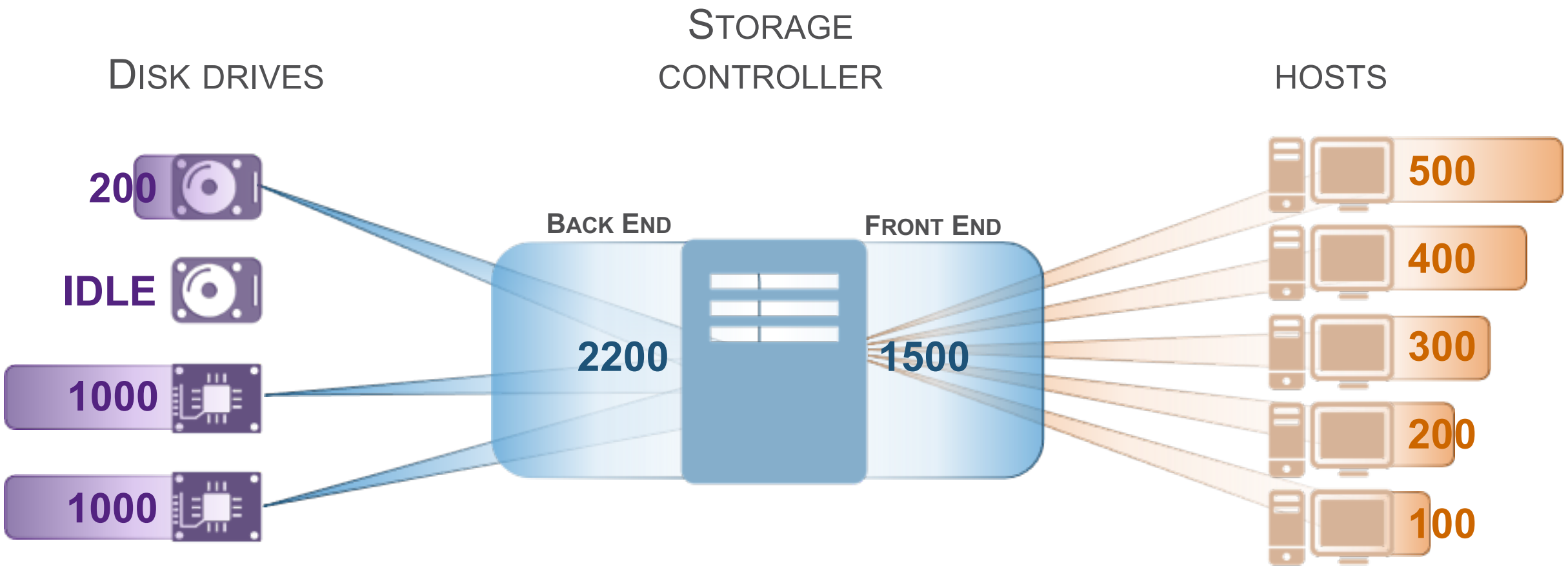

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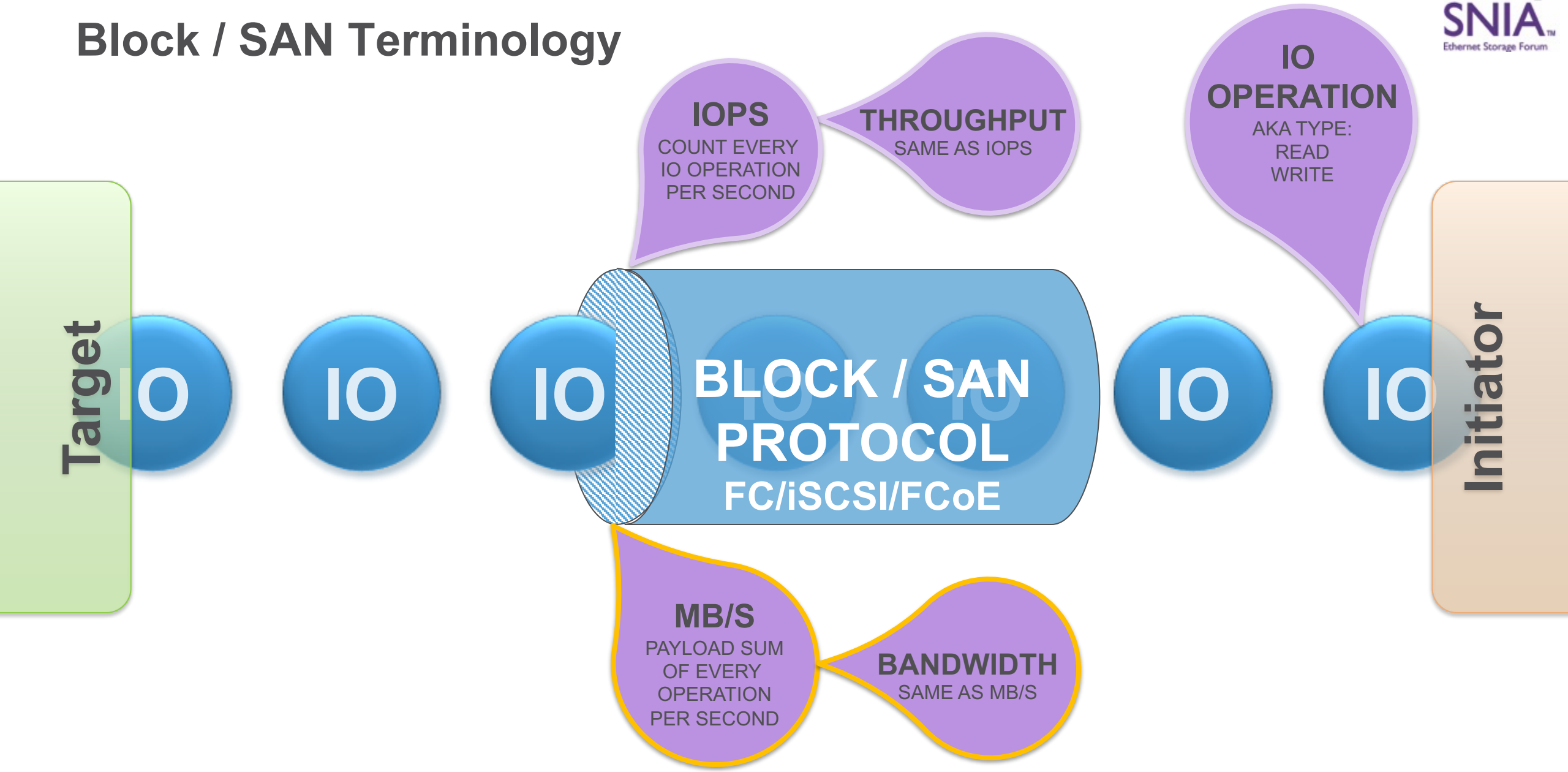

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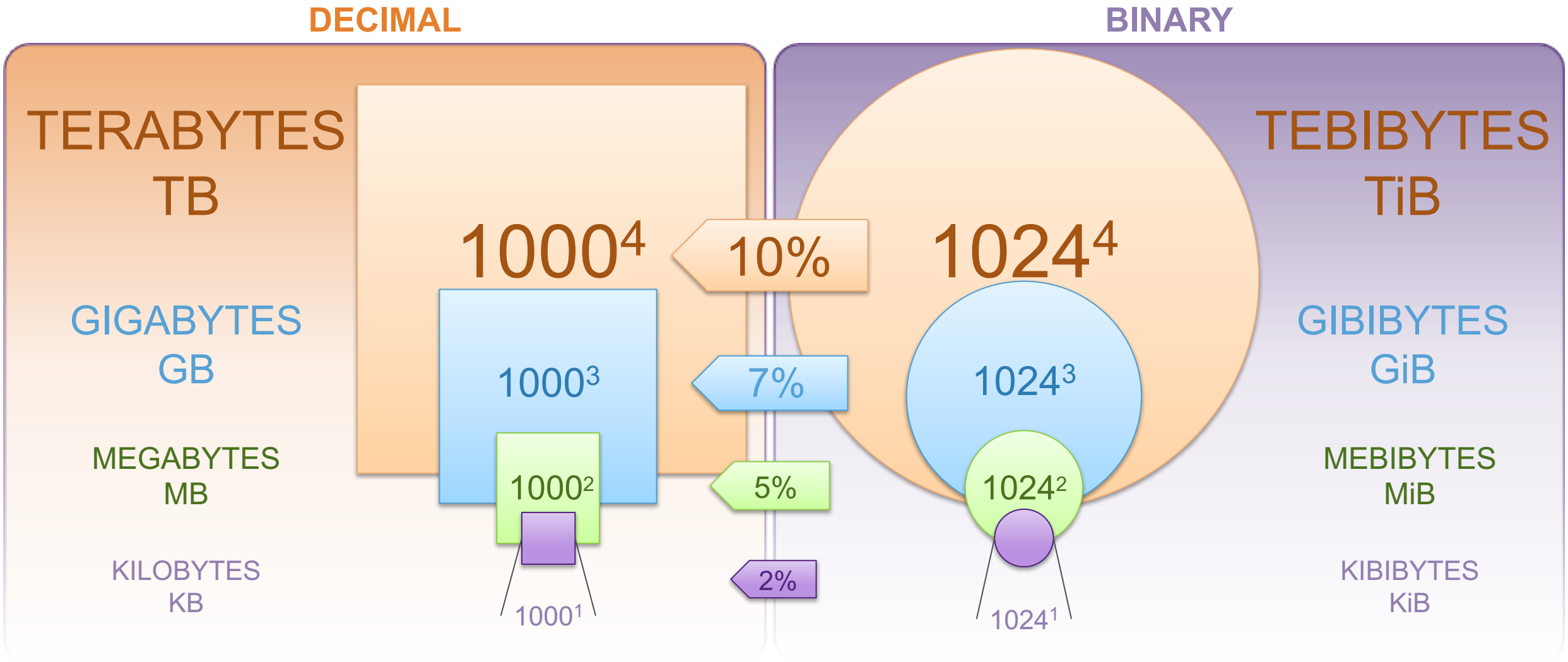
MB/s Vs. MiB/s



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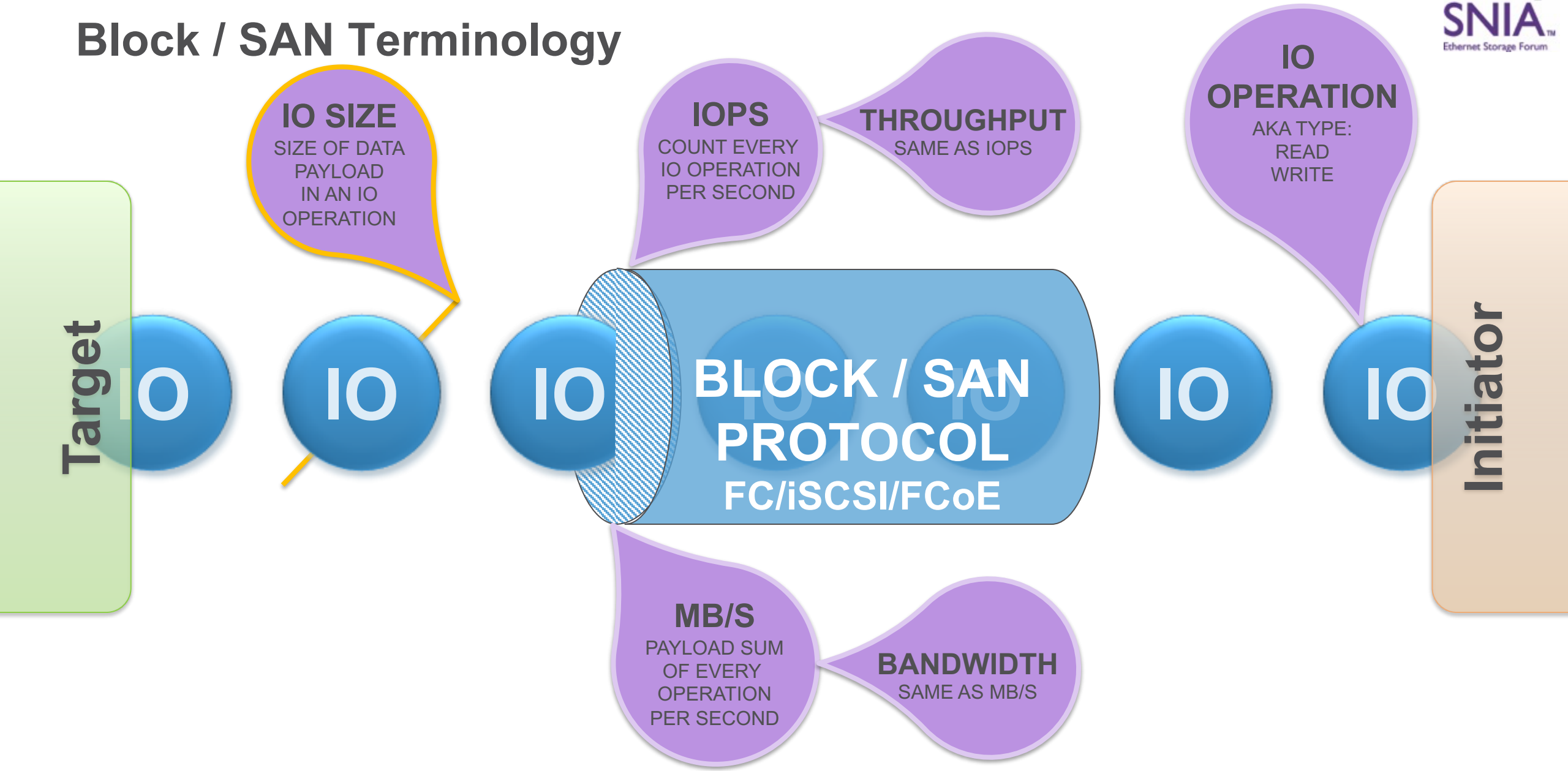
Block / SAN Terminology



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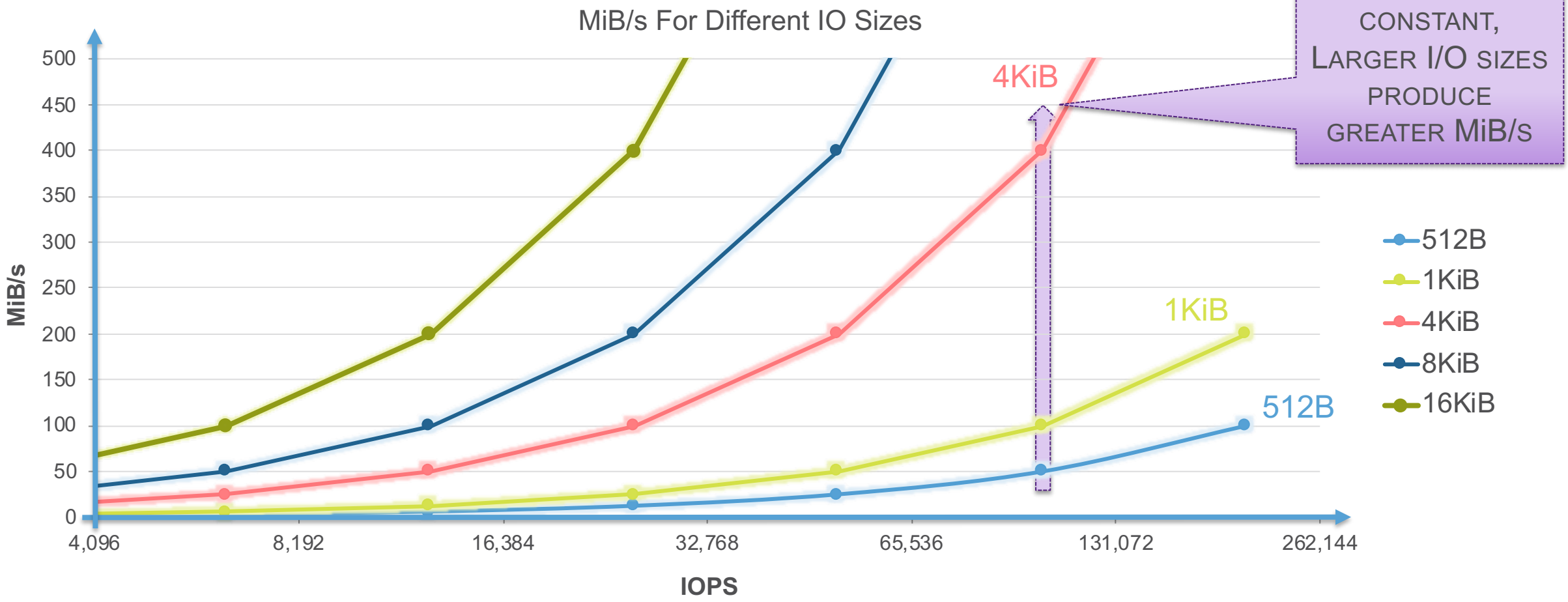
MB/s (or MiB/s), IO Size, And IOPS

$$MiB/s = IO\ Size * IOPS$$



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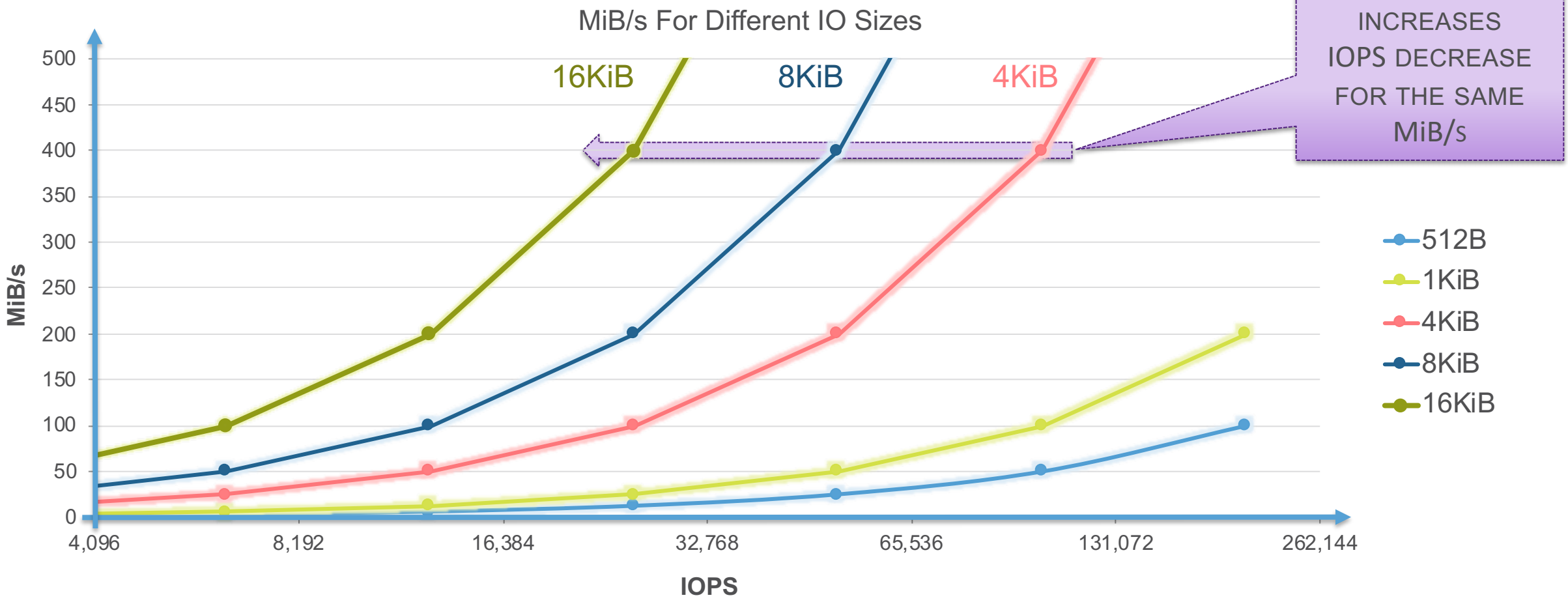

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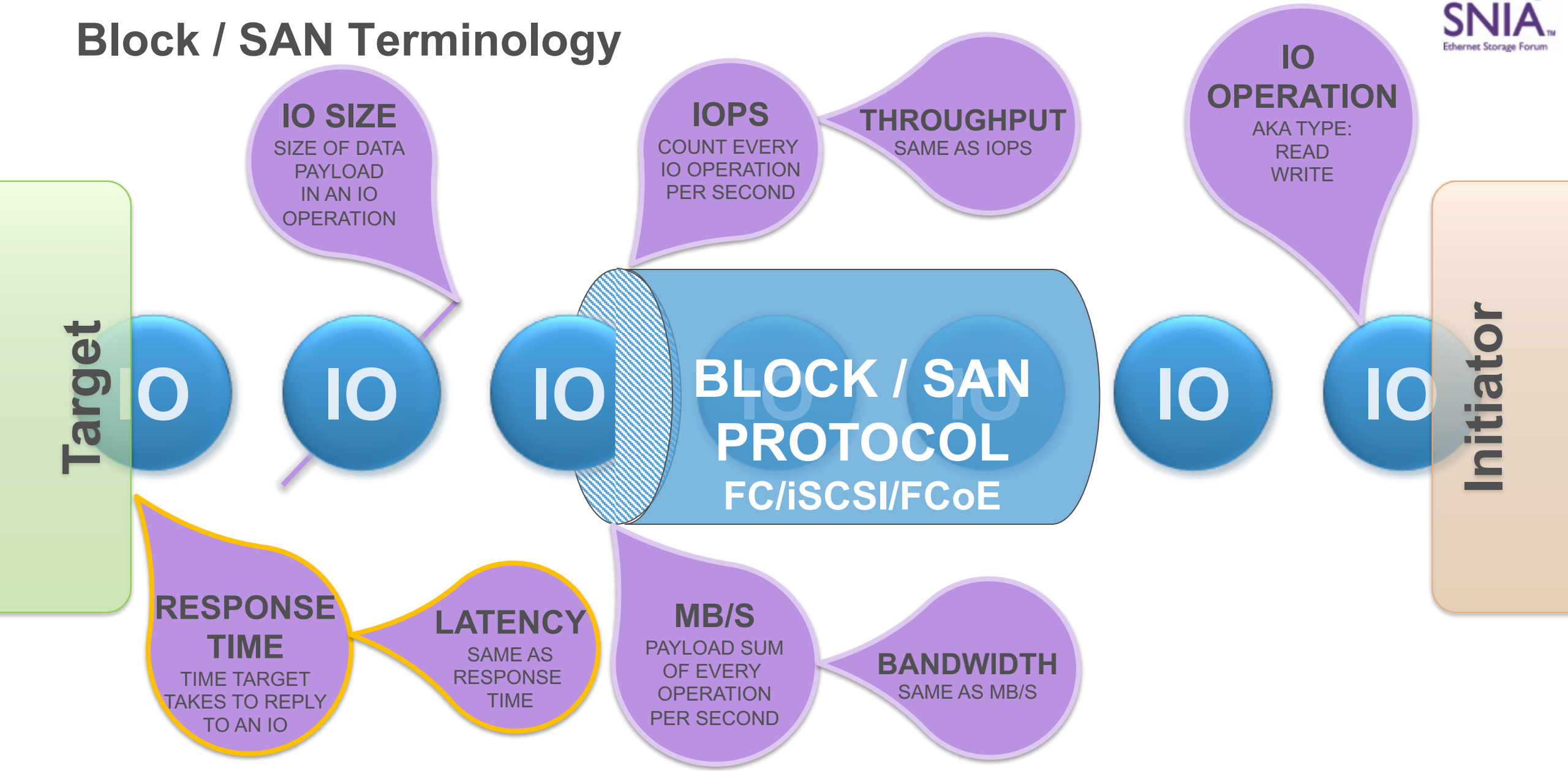

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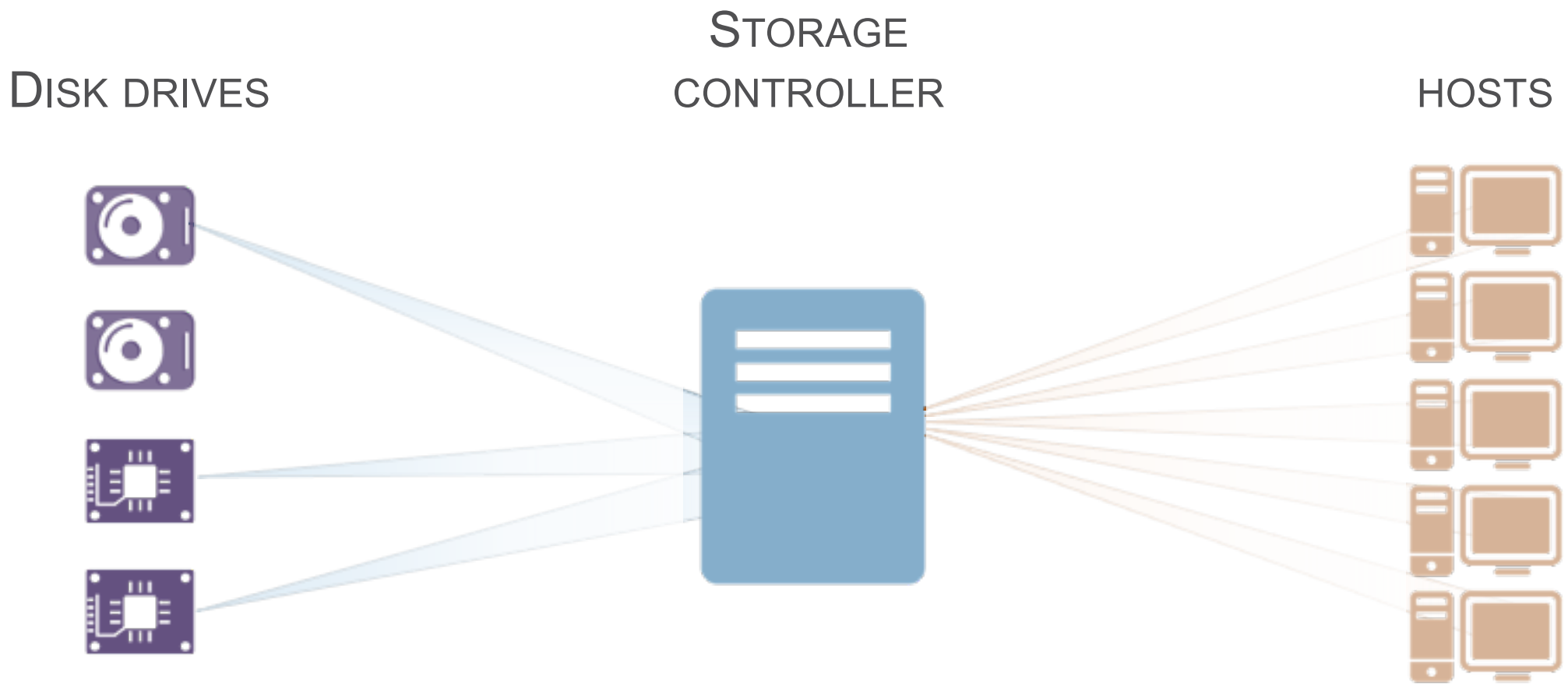
Aggregate Property Of Response Time



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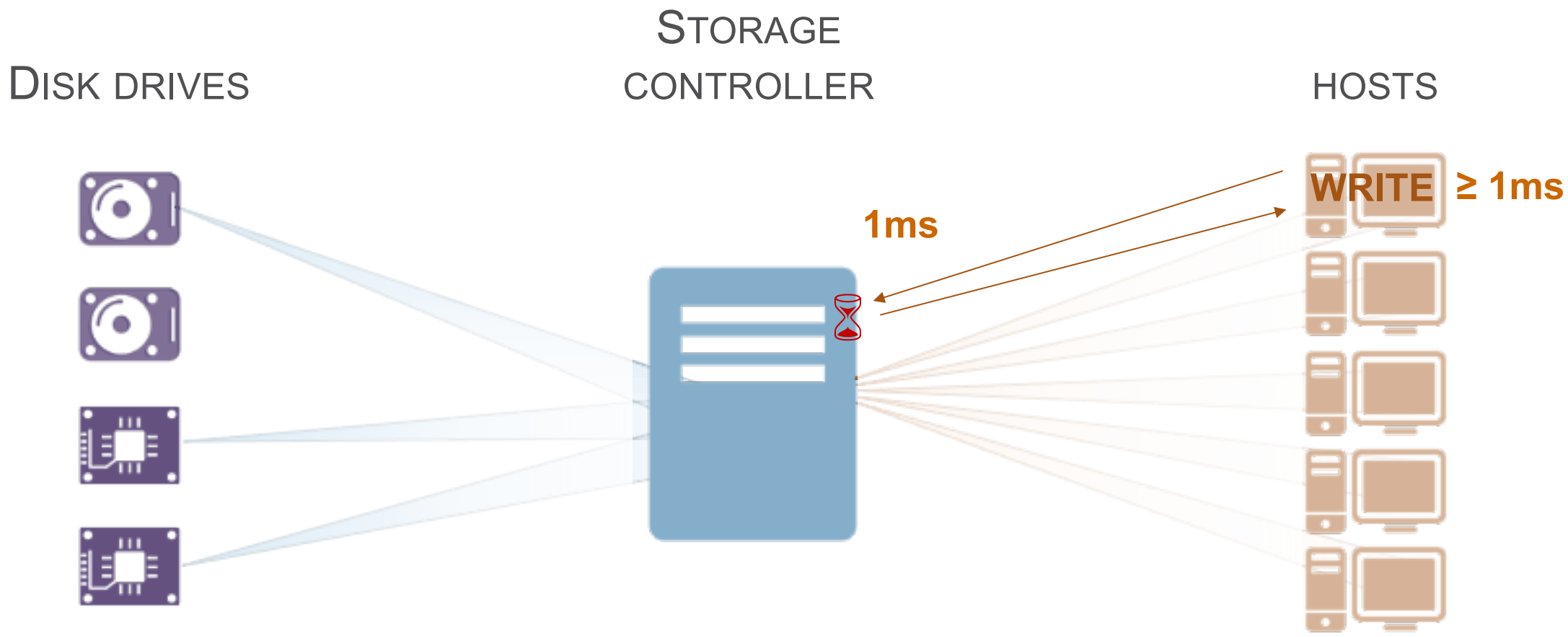
Aggregate Property Of Response Time



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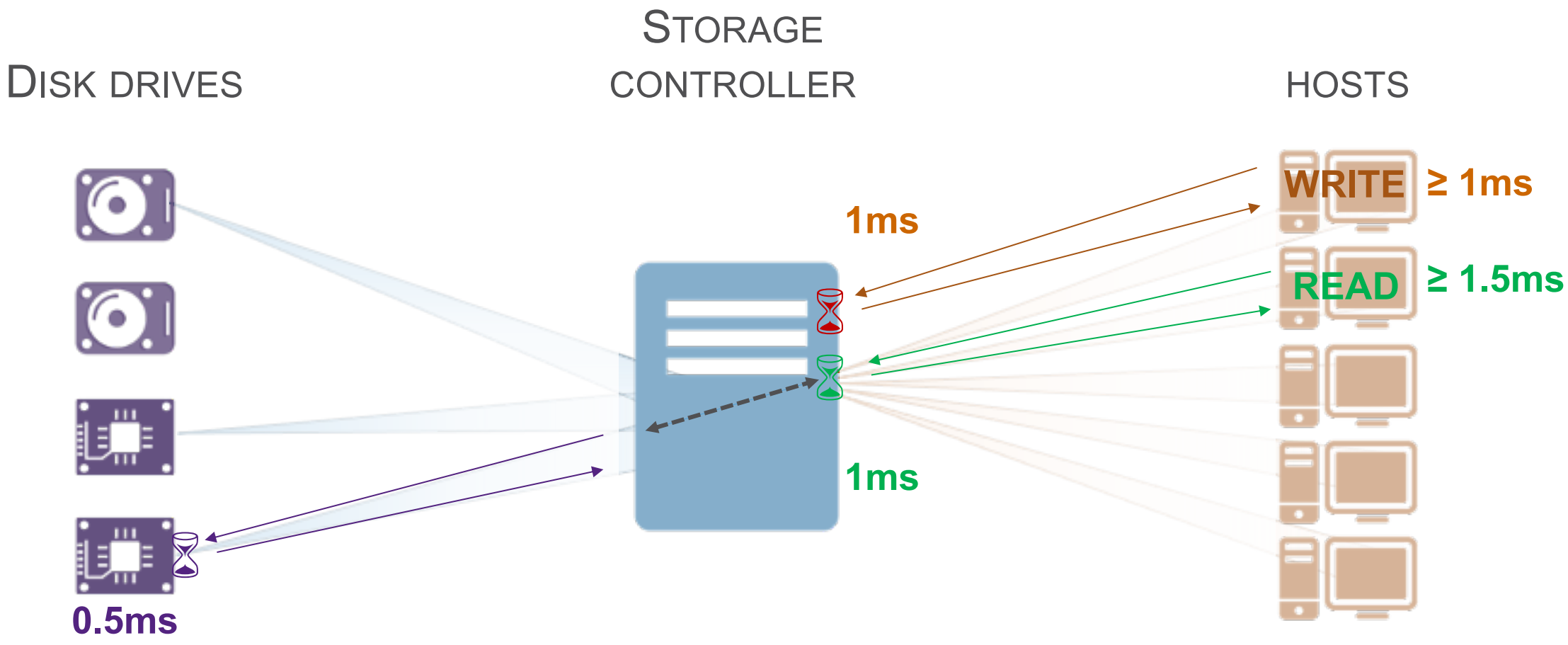
Aggregate Property Of Response Time



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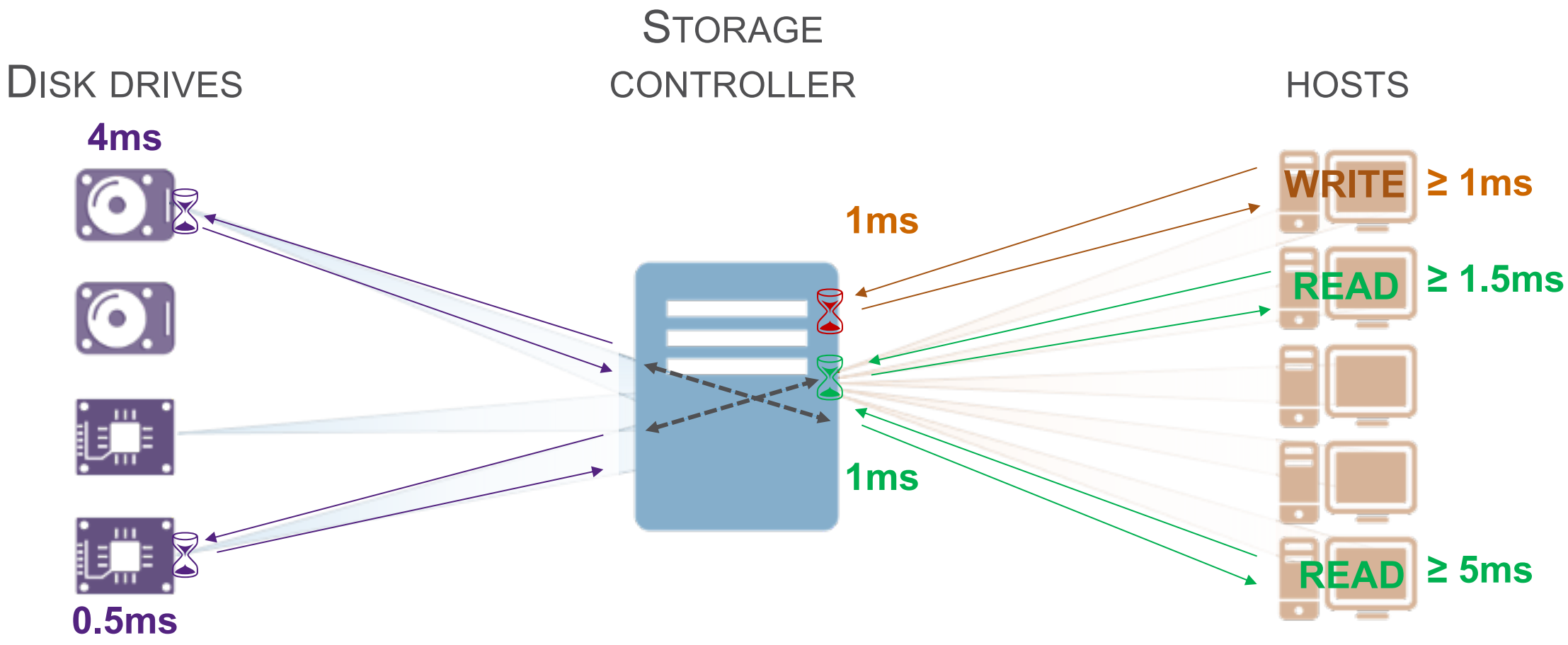
Aggregate Property Of Response Time



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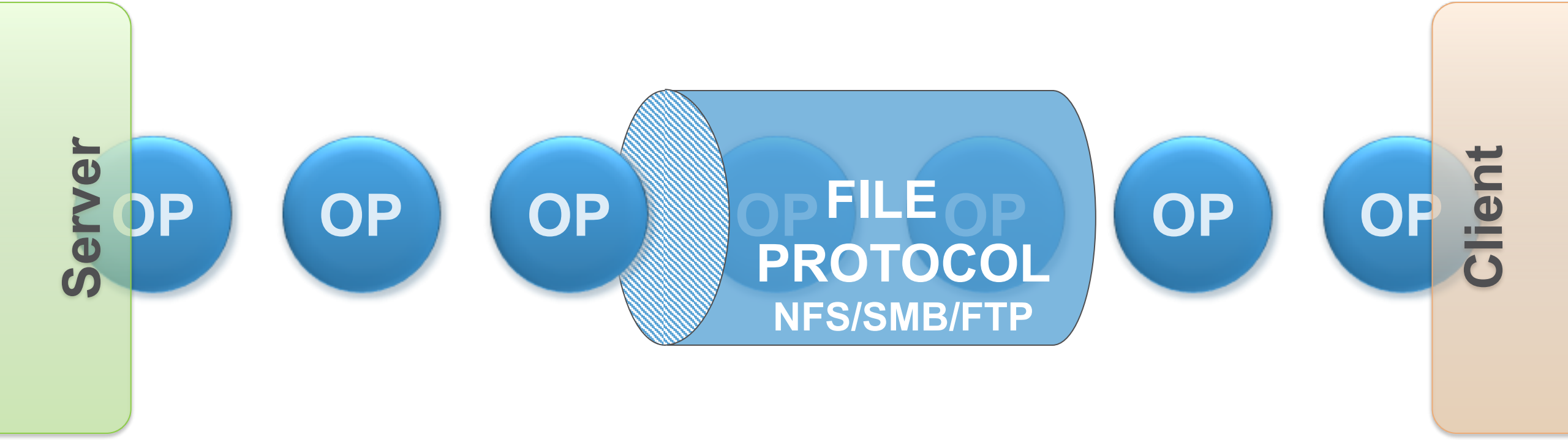
File / NAS Terminology



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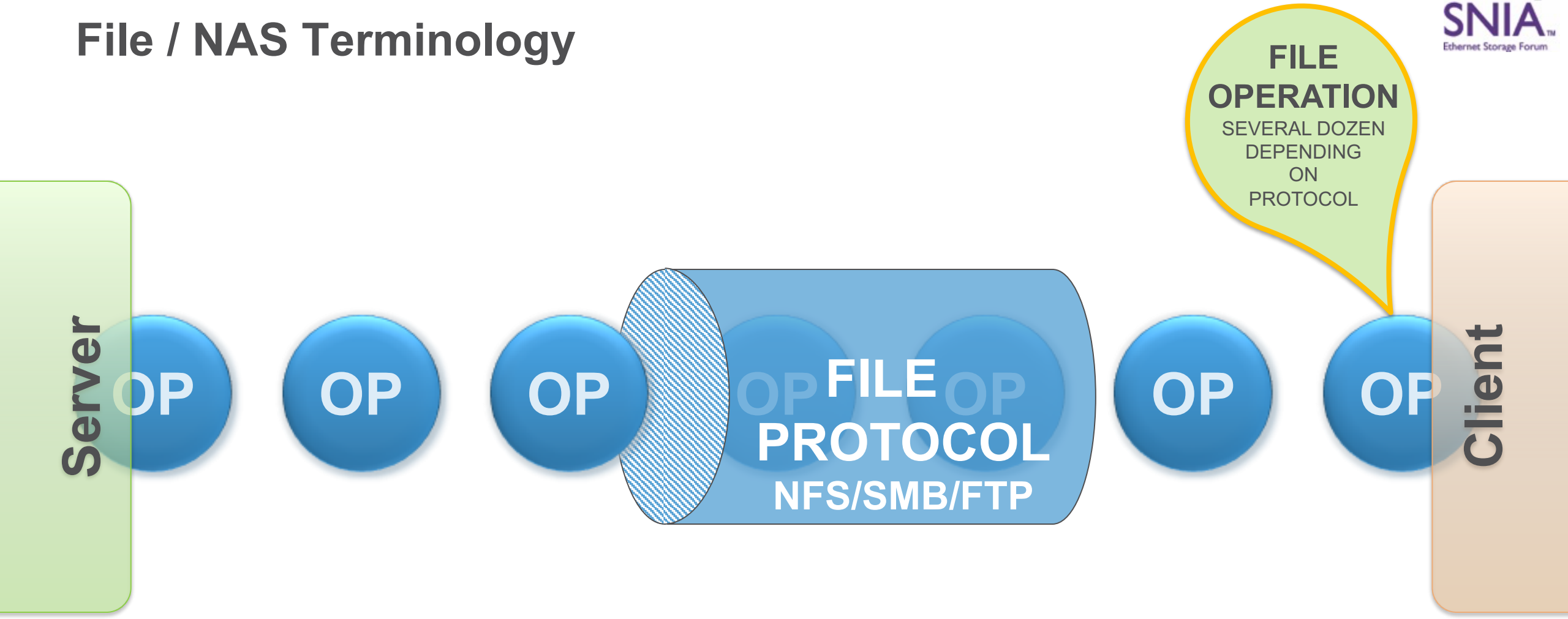

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NFSv4 Operations

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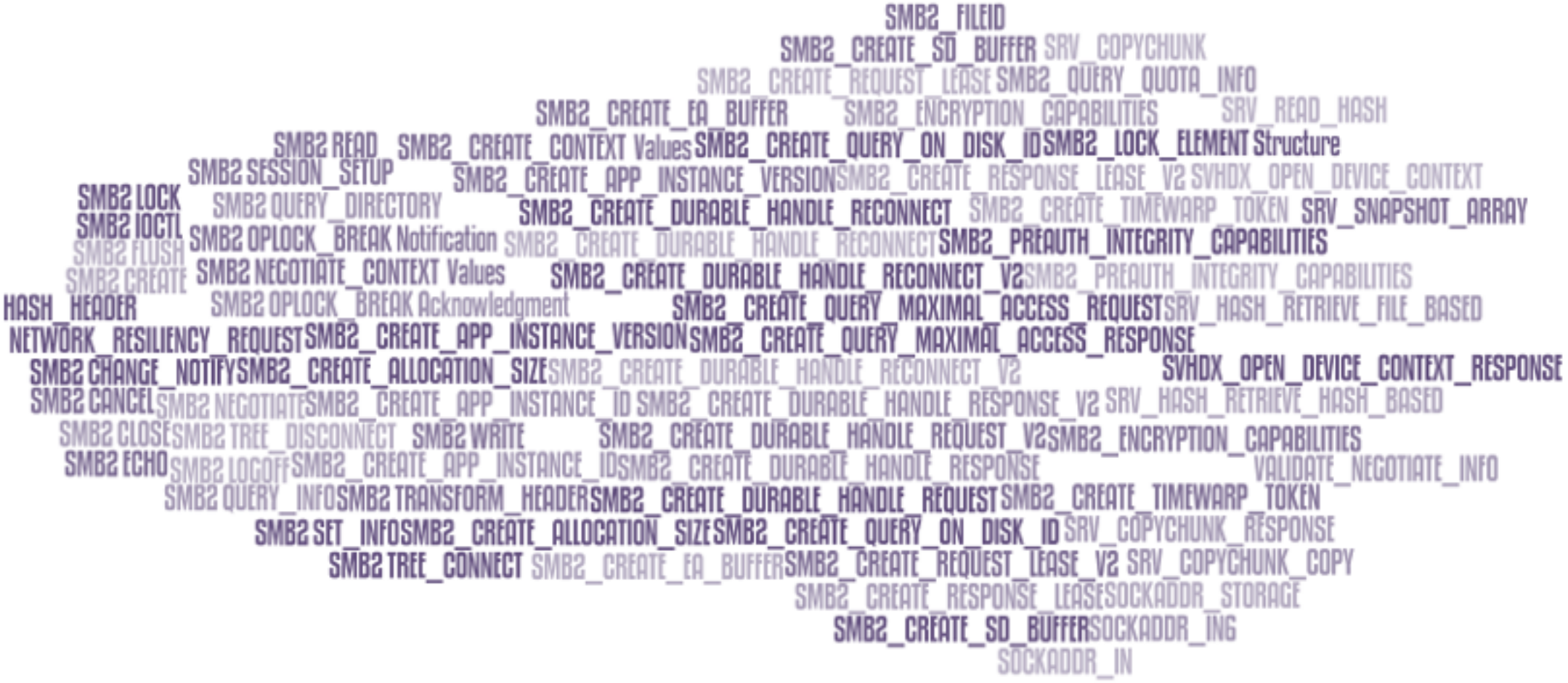
SMB3 Operations



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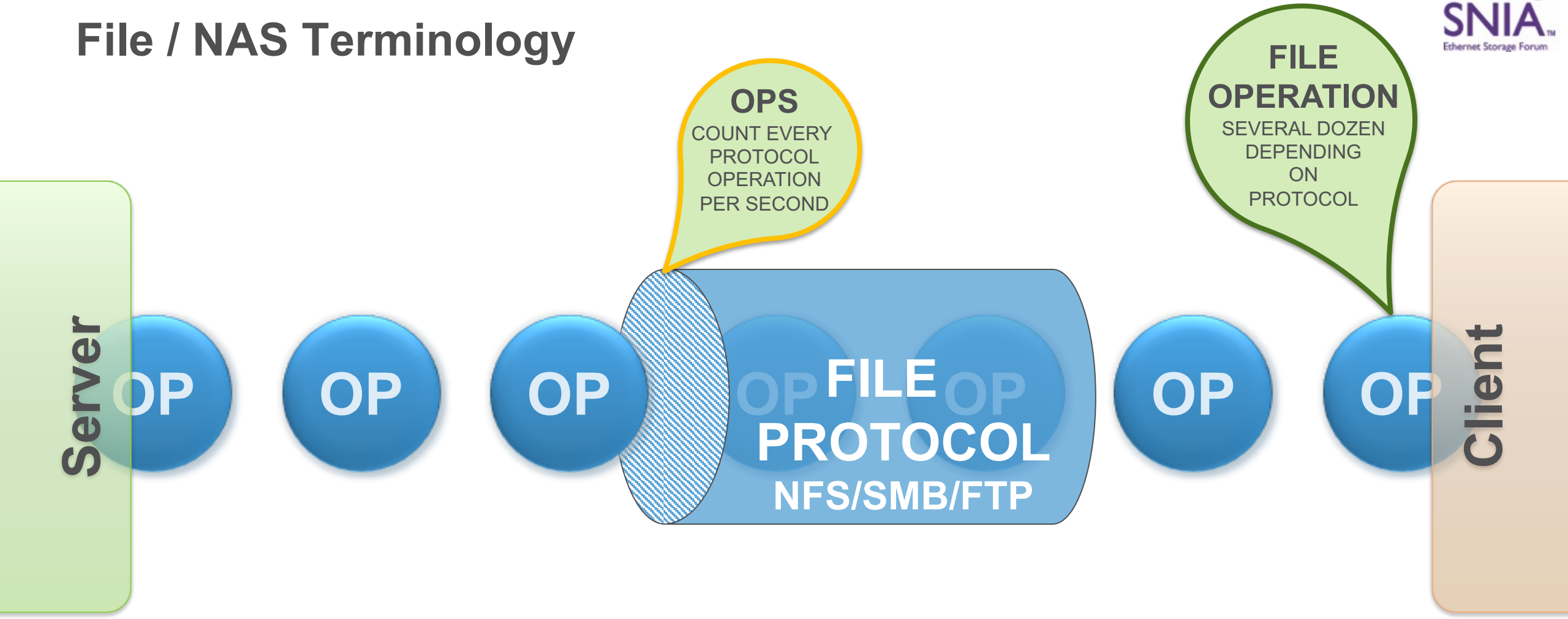

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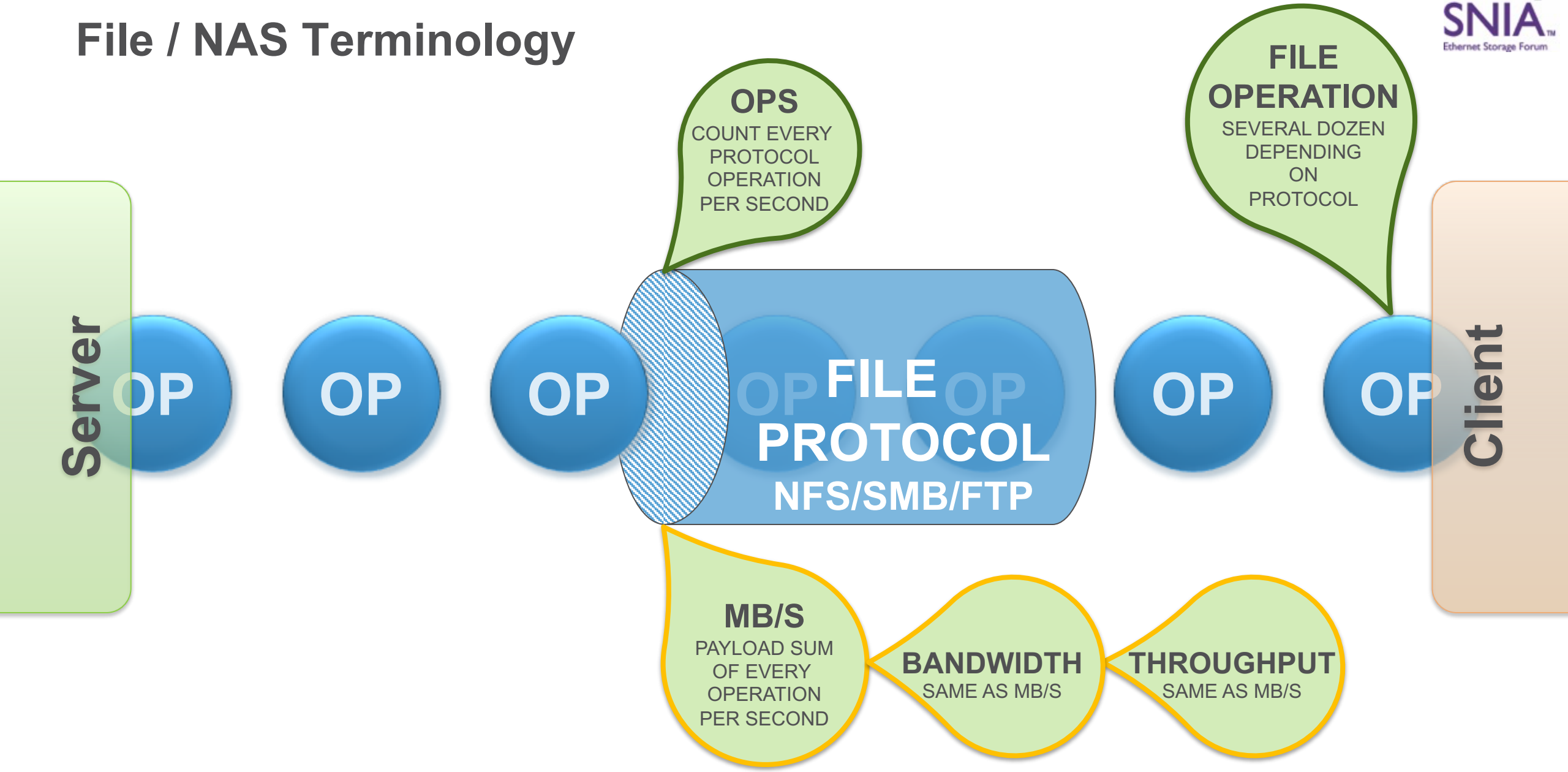

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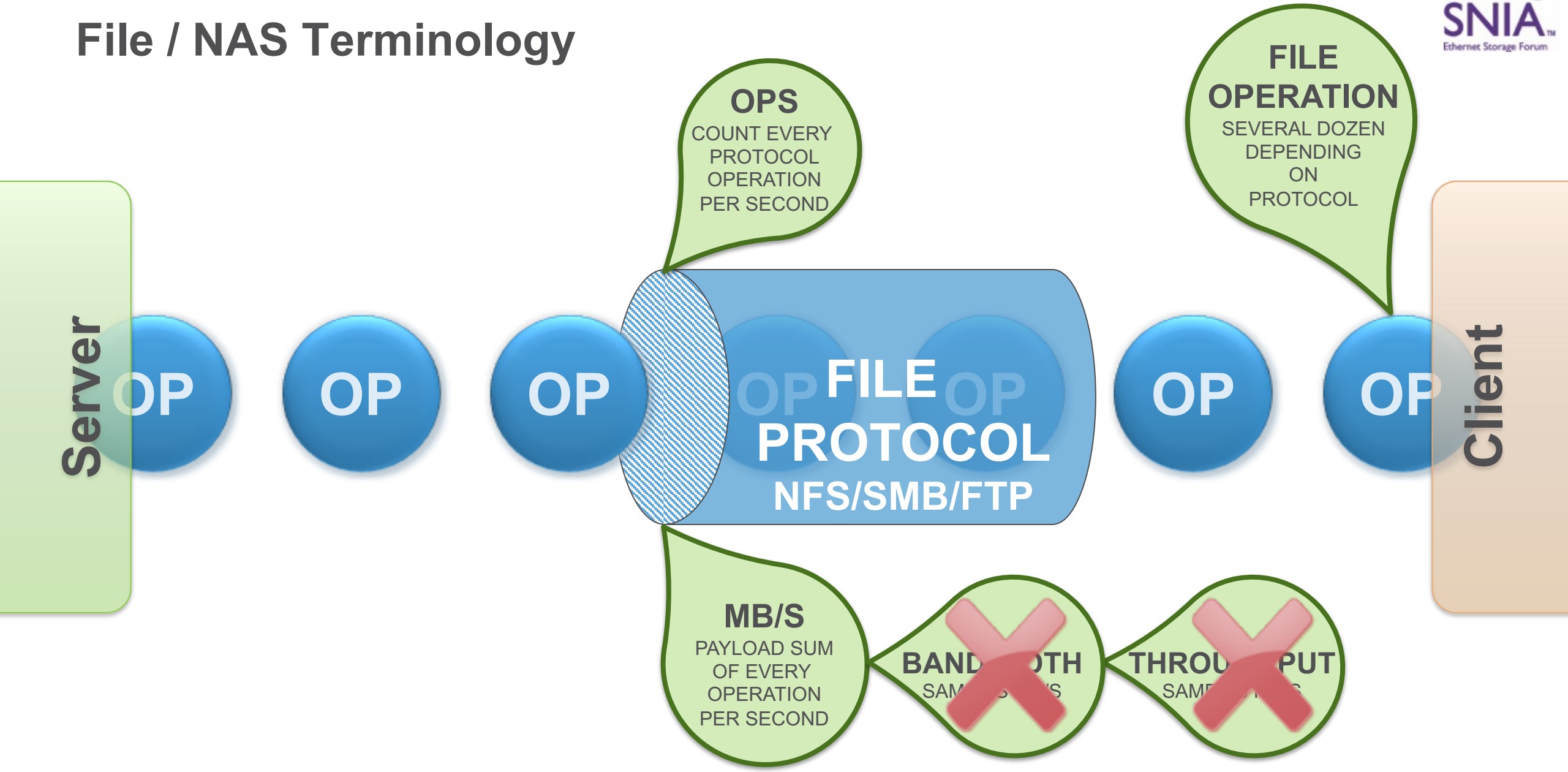

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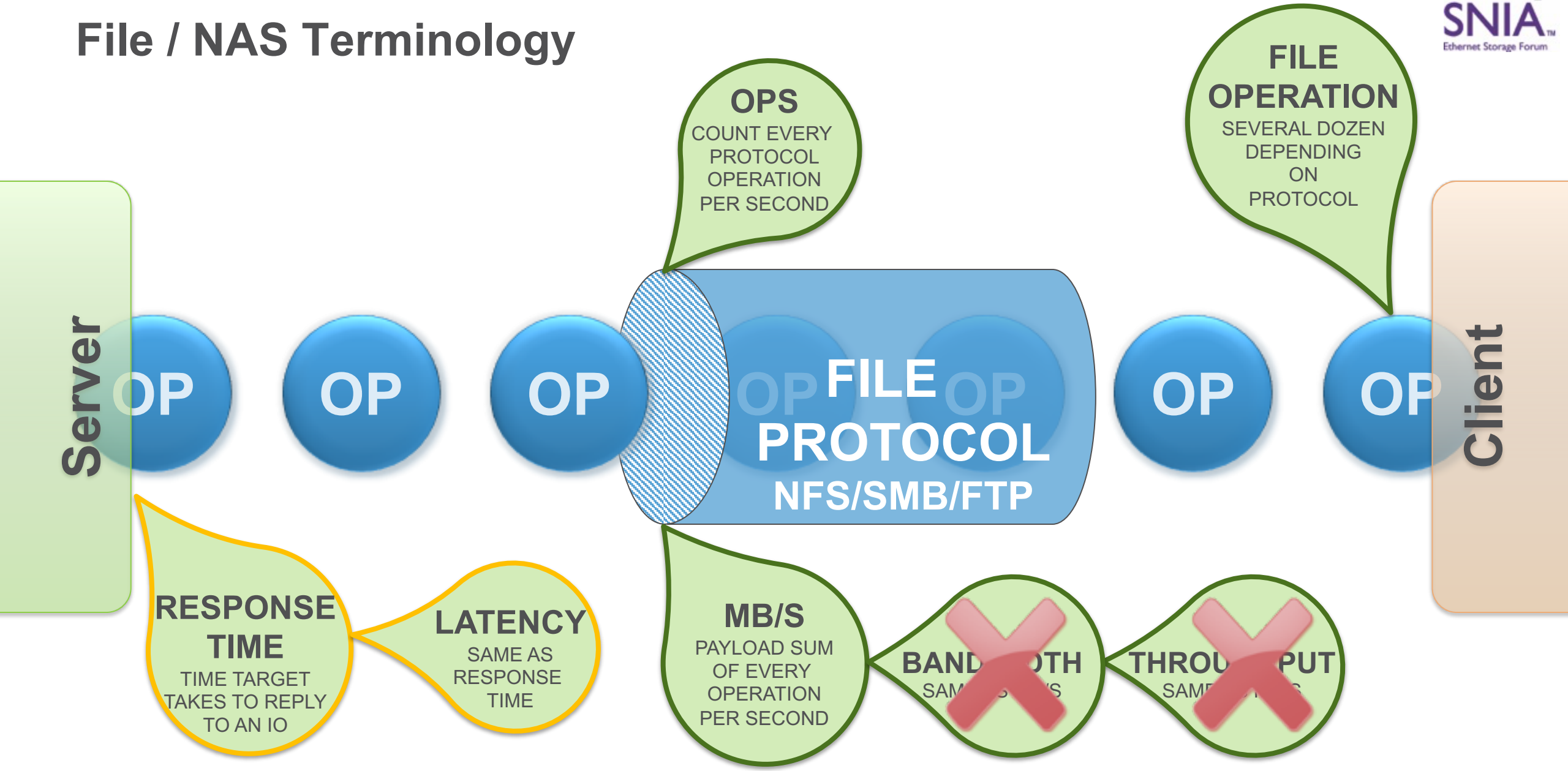

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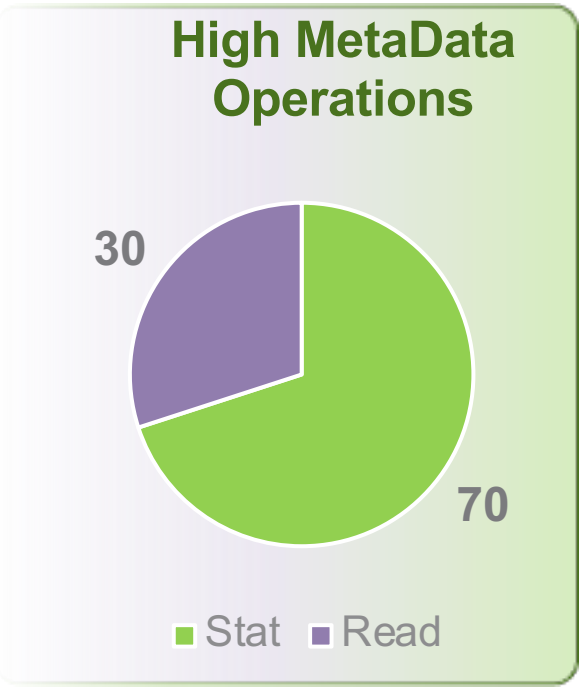
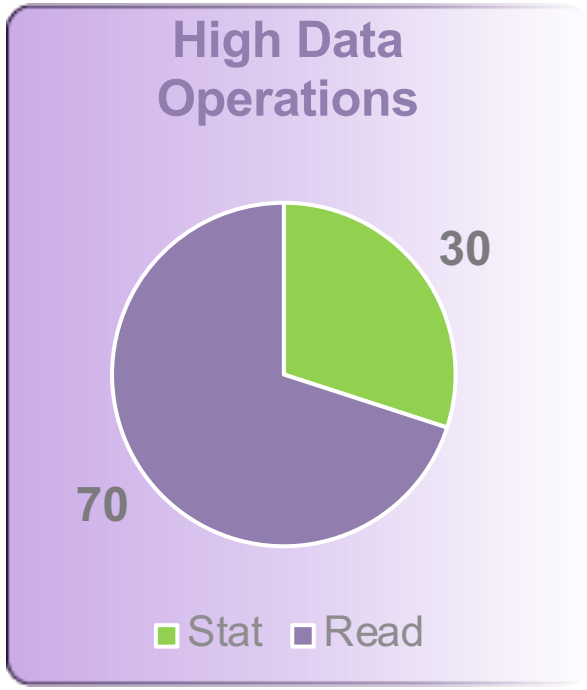
Difference Between OPS and MB/s (MiB/s)

- Two Otherwise Identical Runs With Different NFS Operations Mix (64 KiB IO Size)





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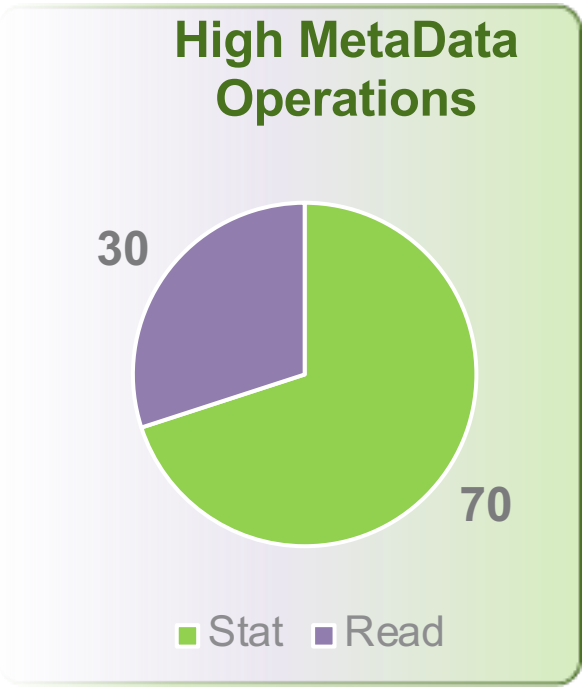

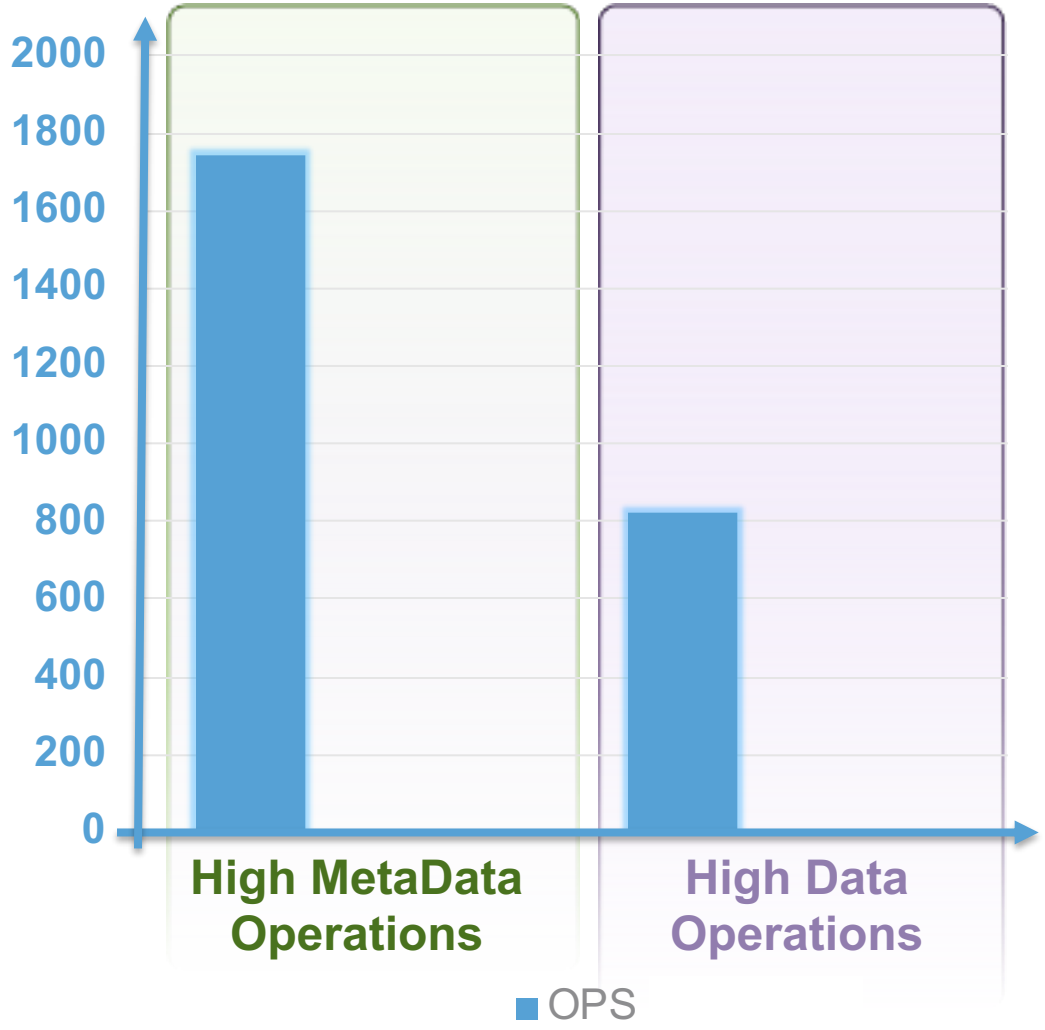

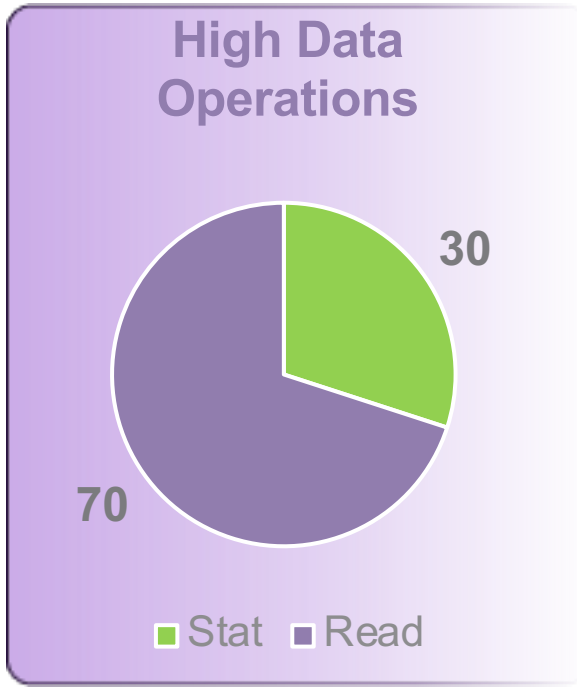

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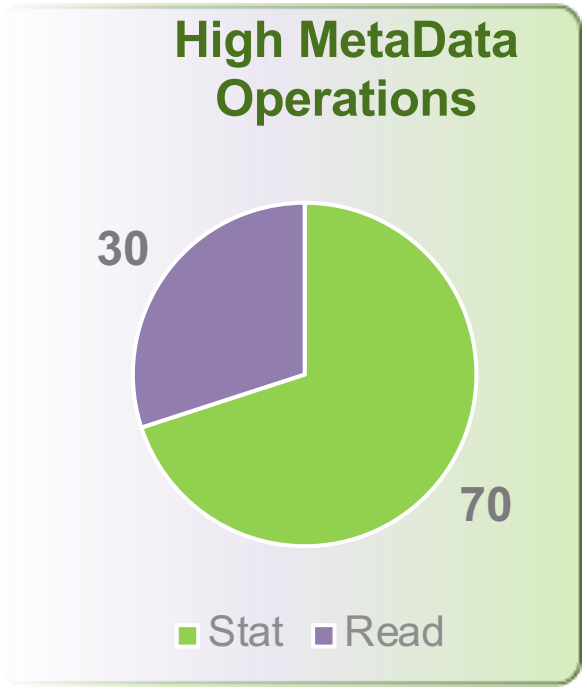

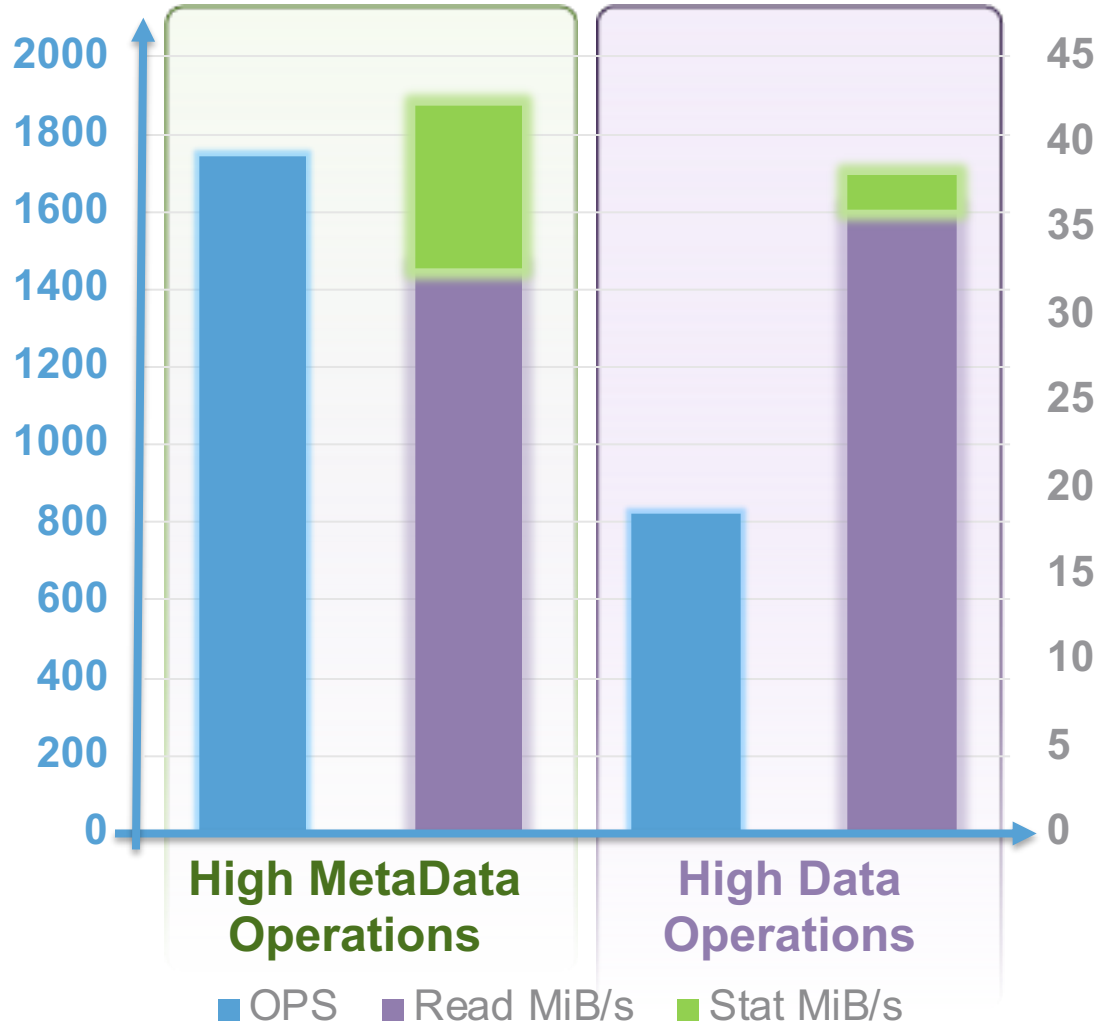

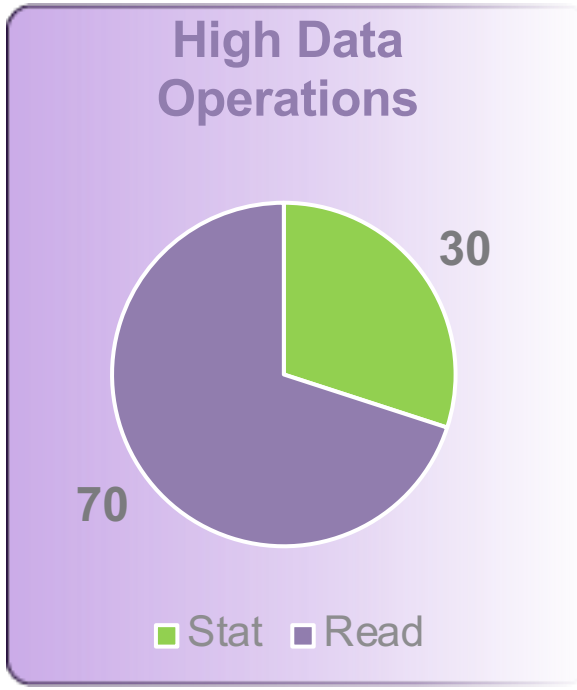

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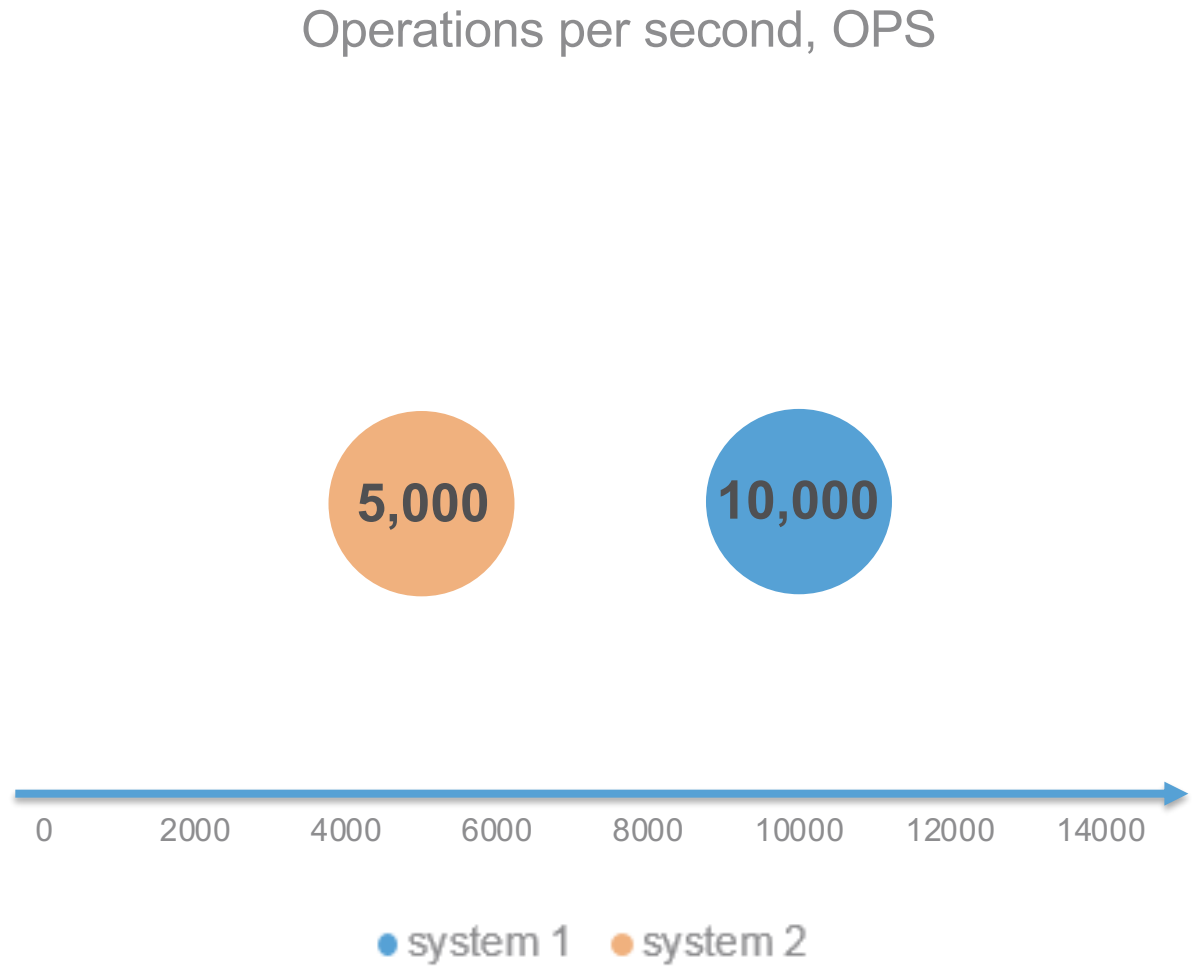
Graph Fun Or Why “It Depends” Is Relevant?



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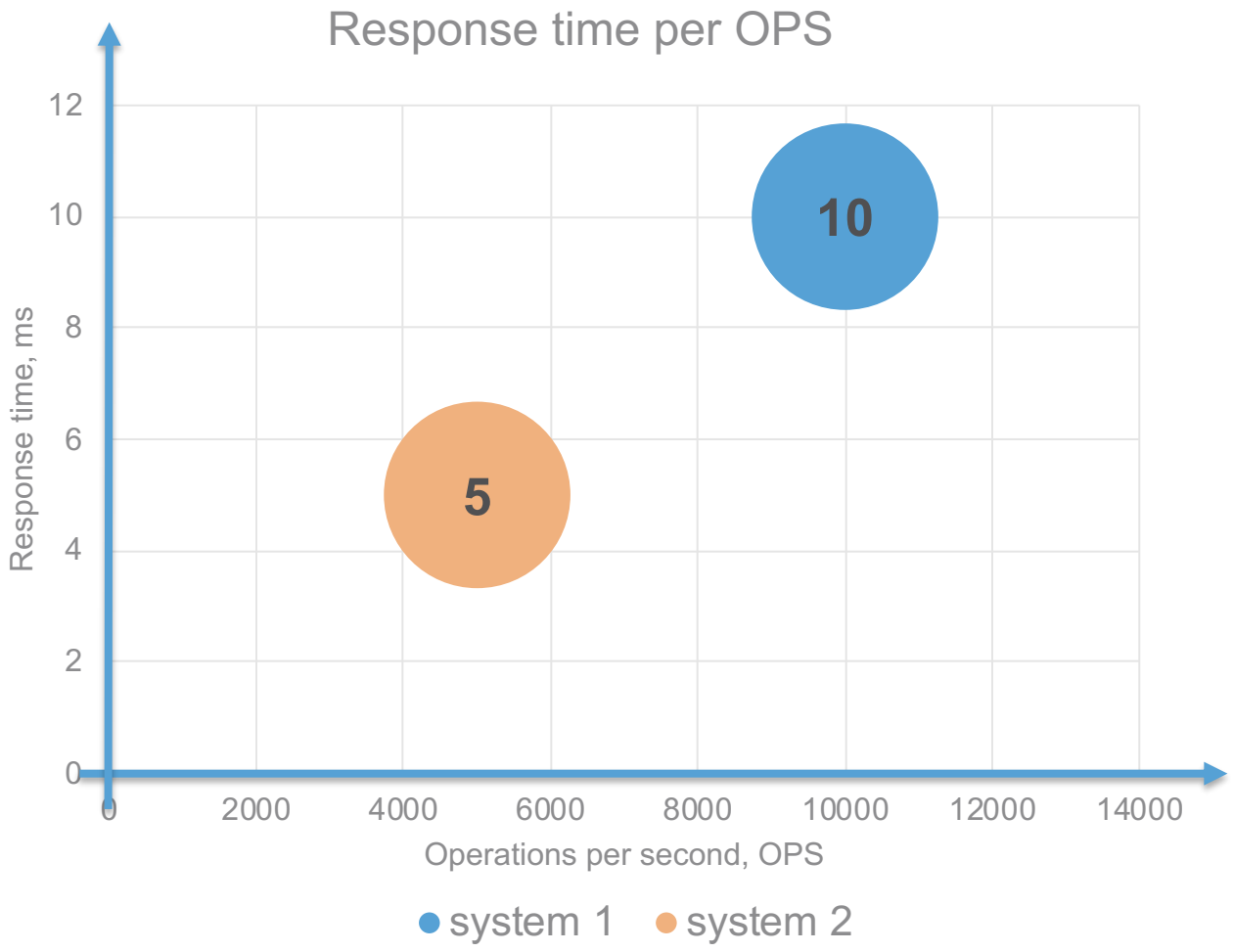

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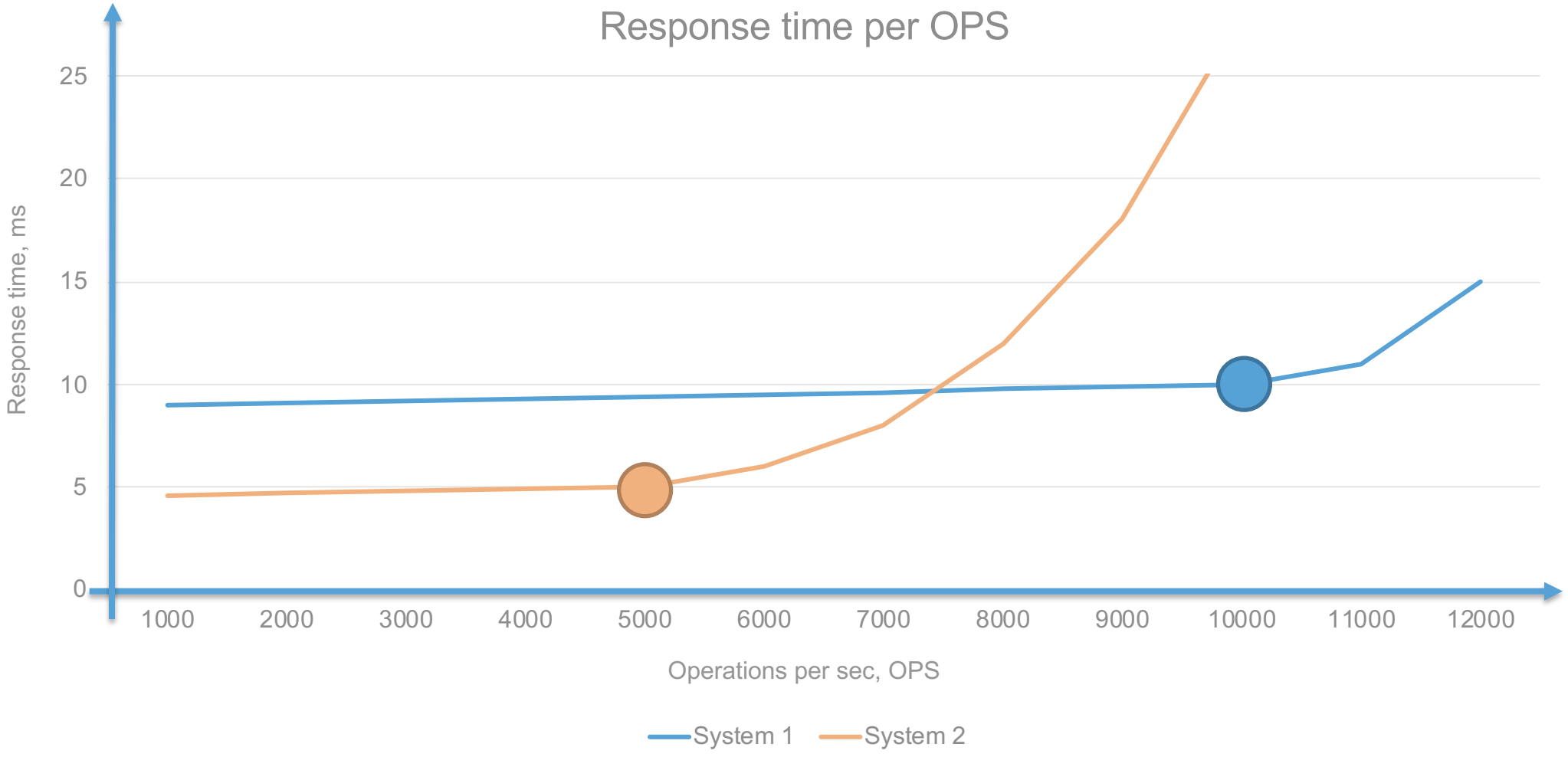

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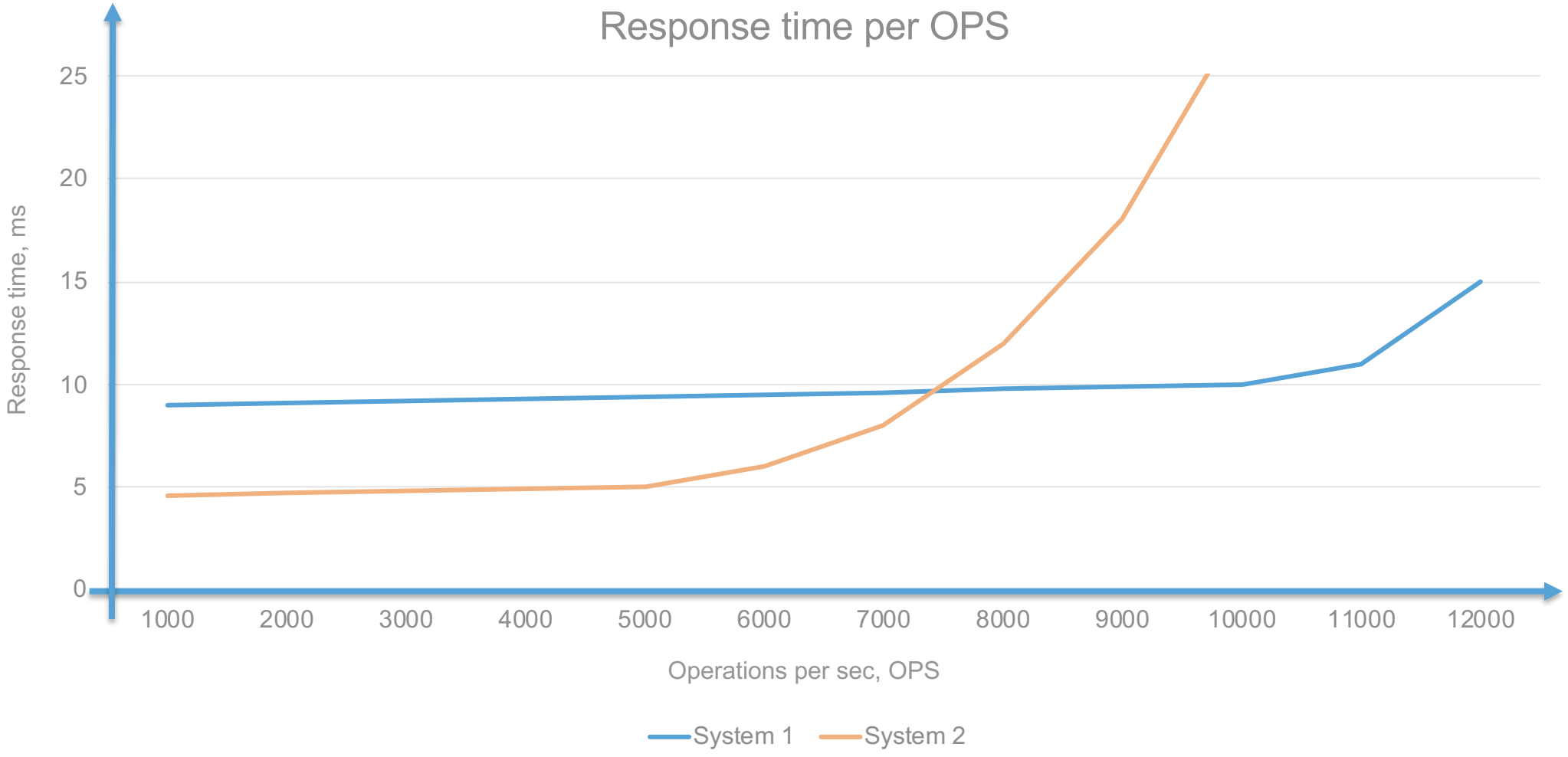

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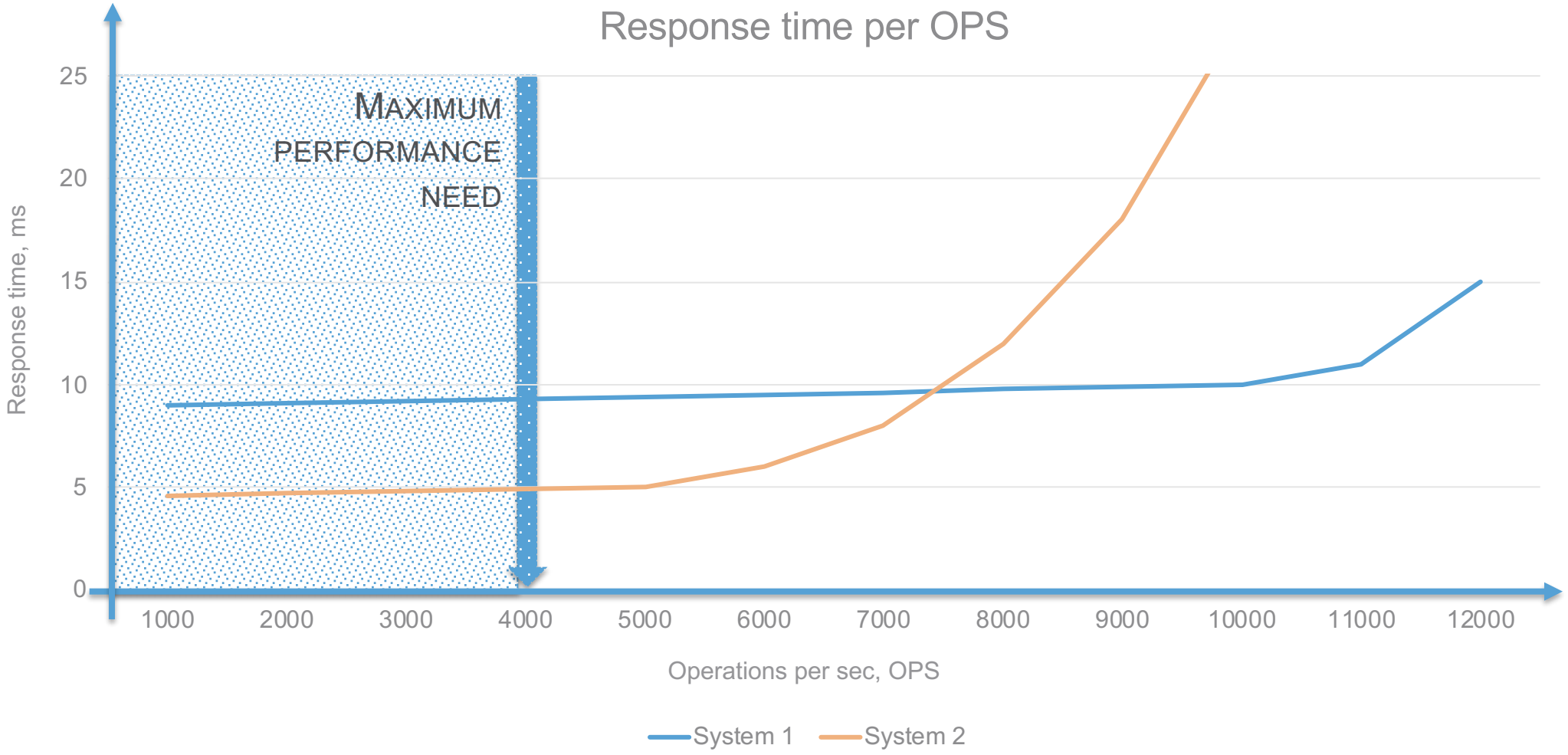

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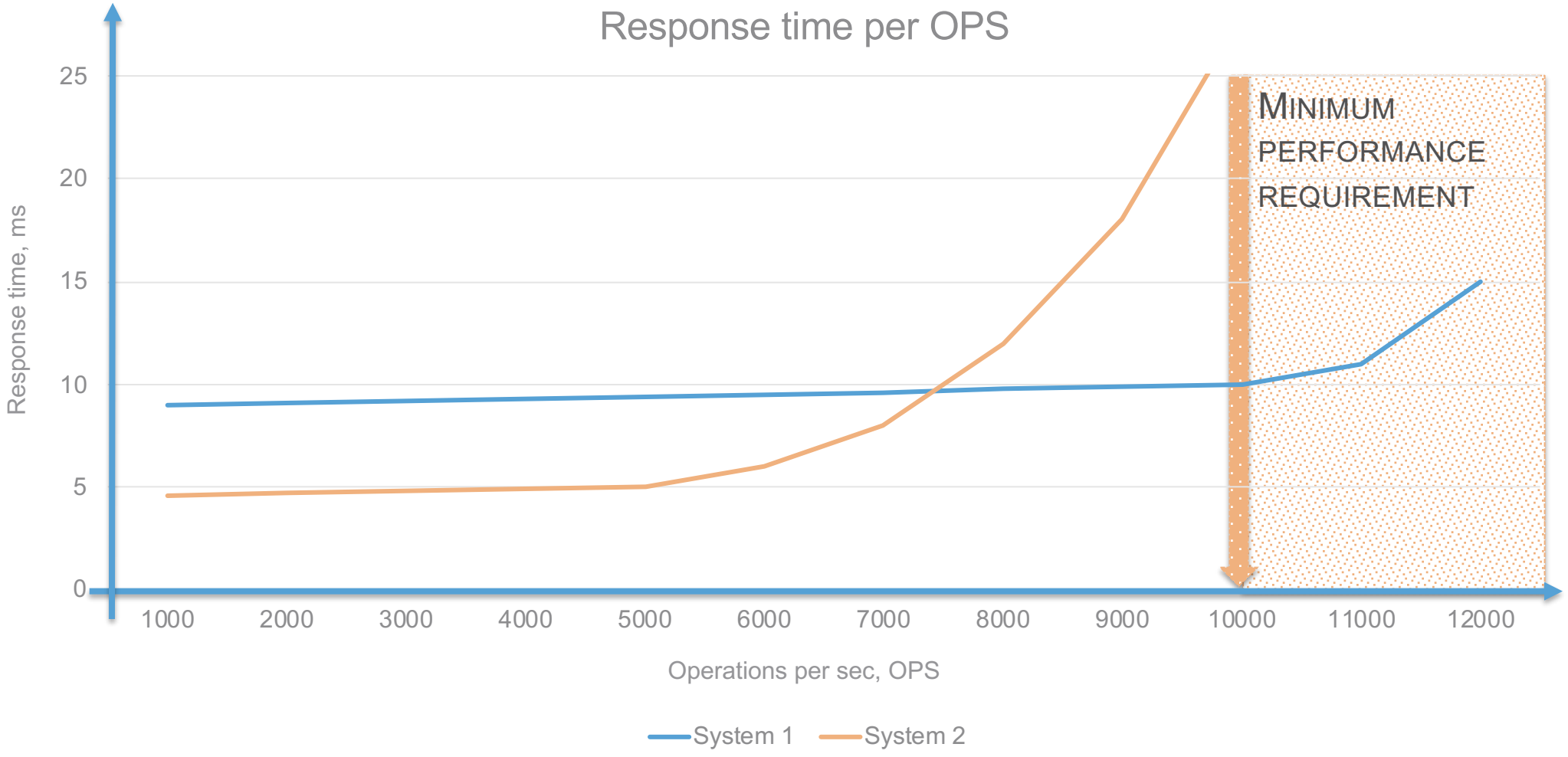

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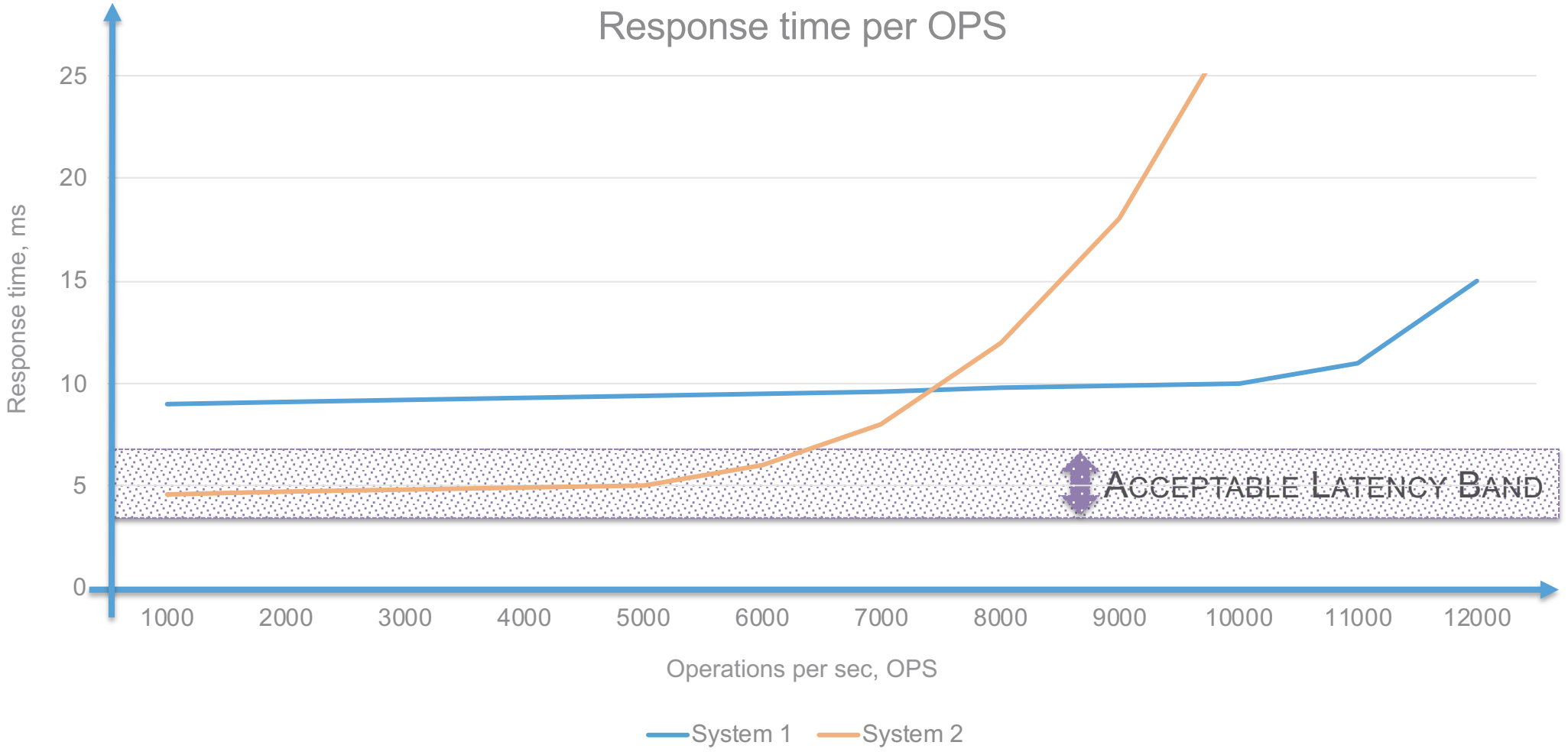

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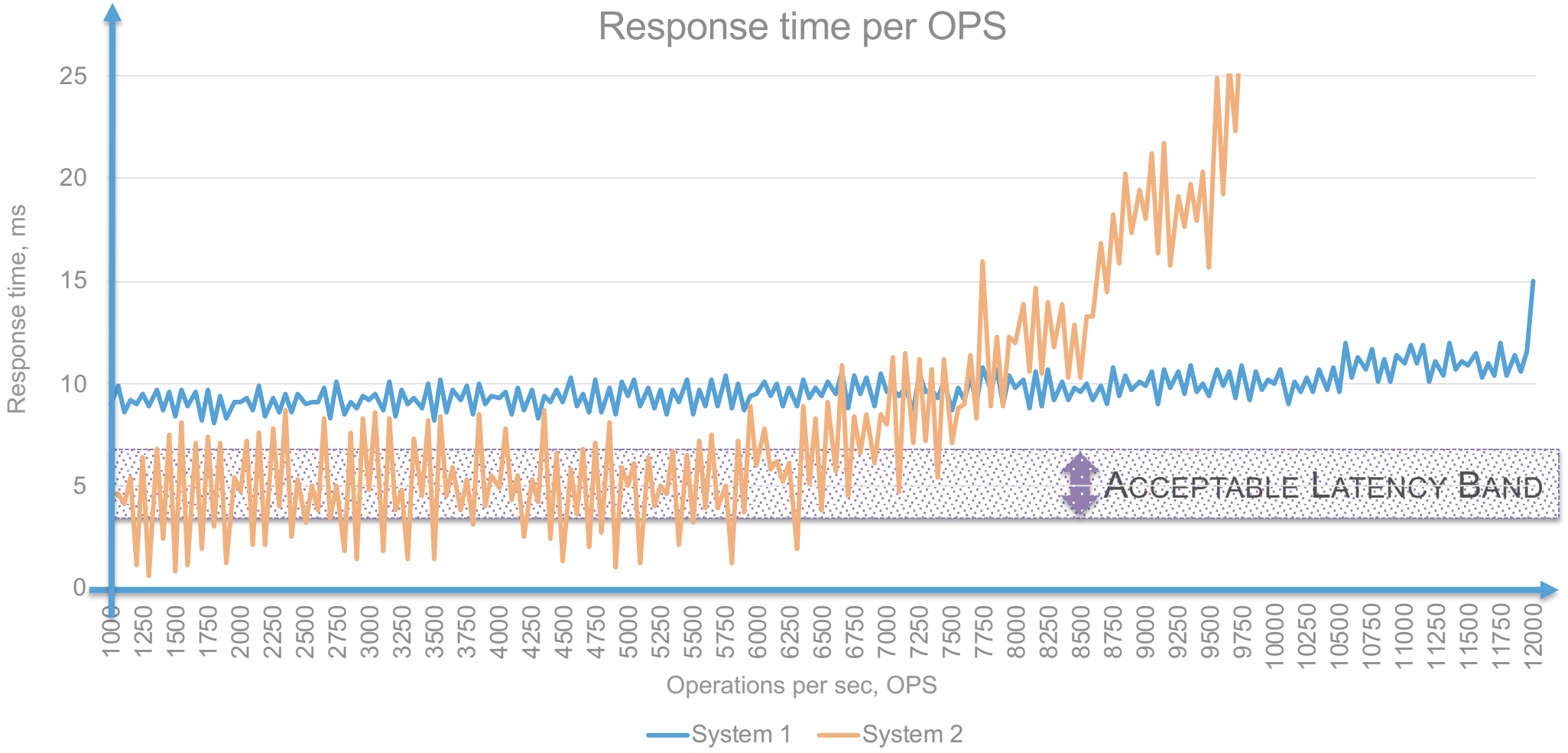
Variance



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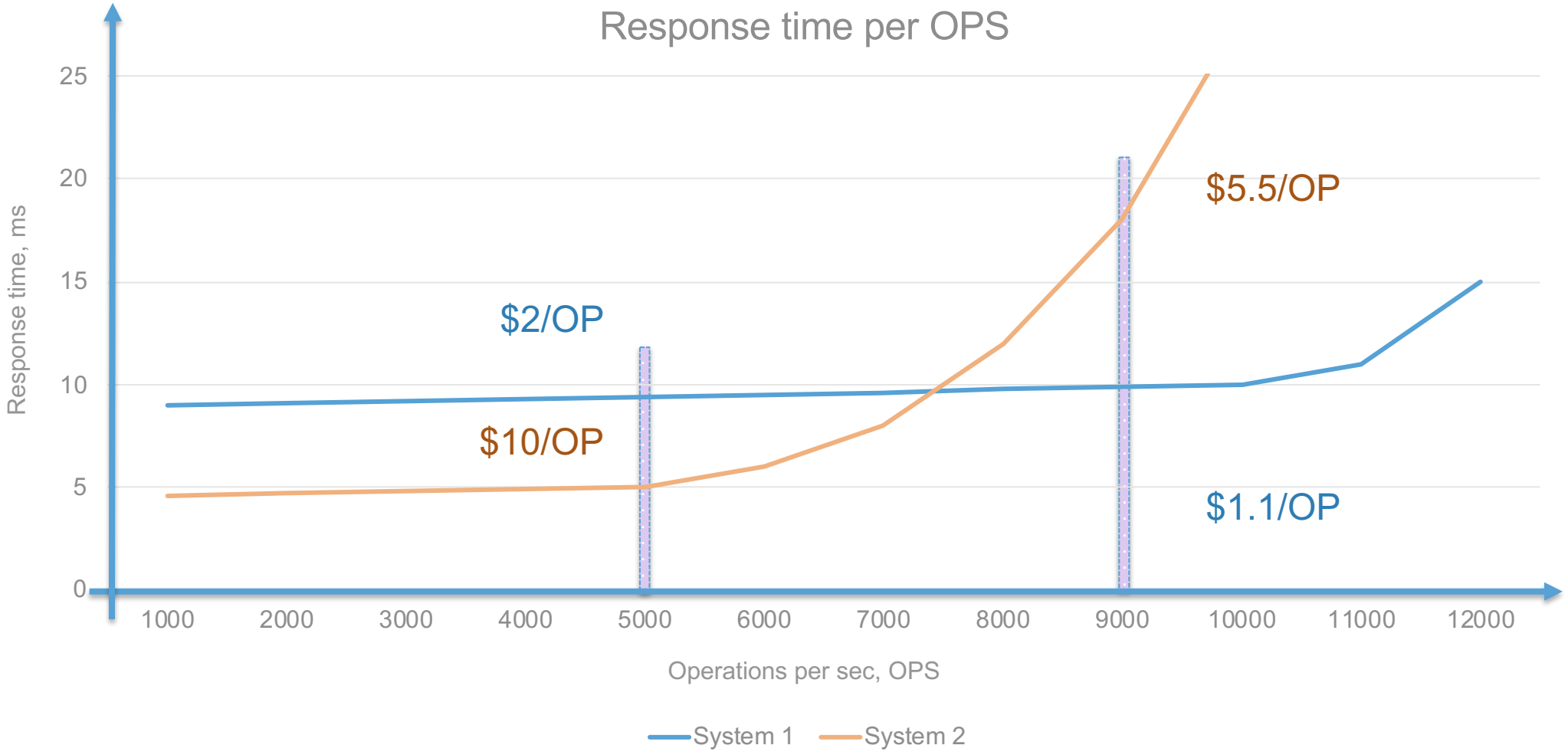
Other Metrics To Consider



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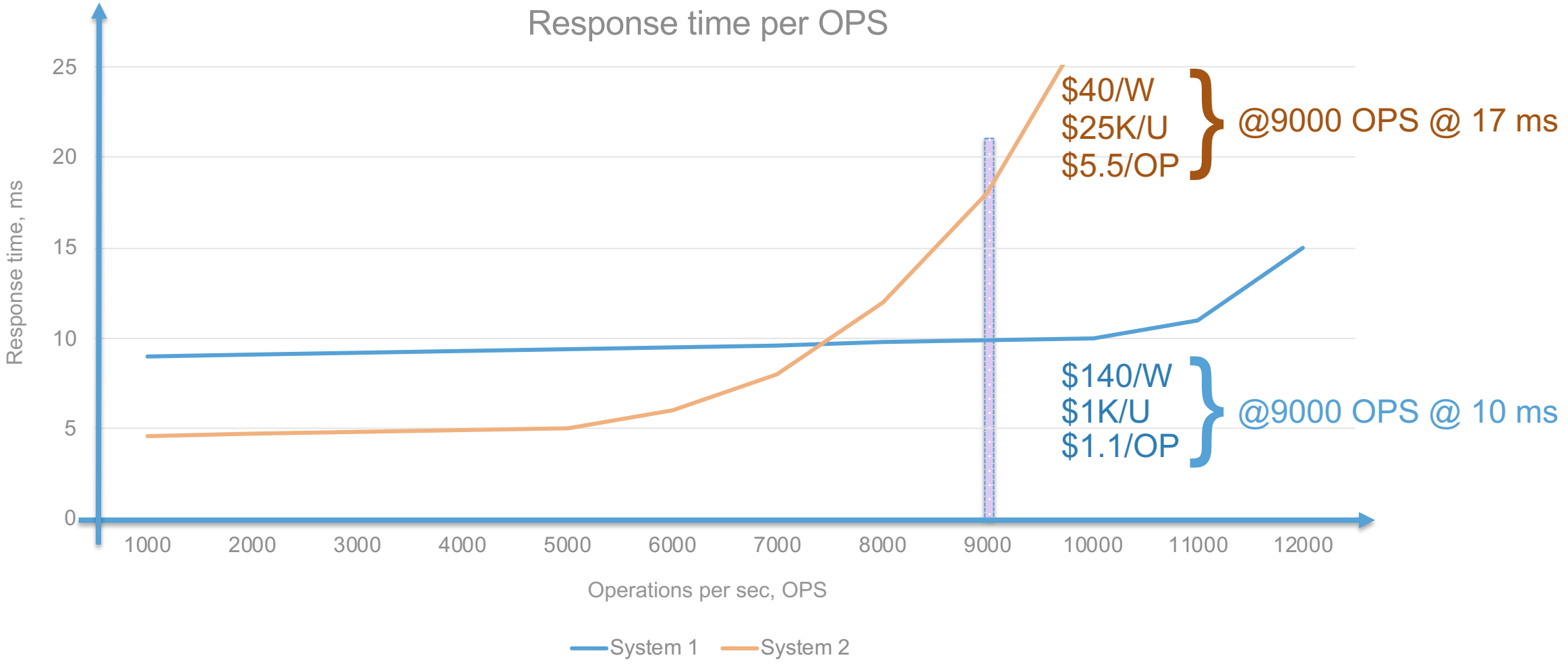

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Other Metrics To Consider

CONTEXT MAKES METRICS MATTER

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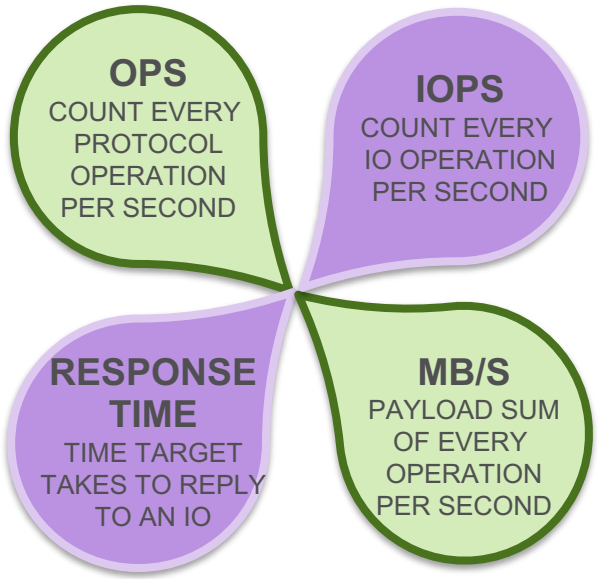
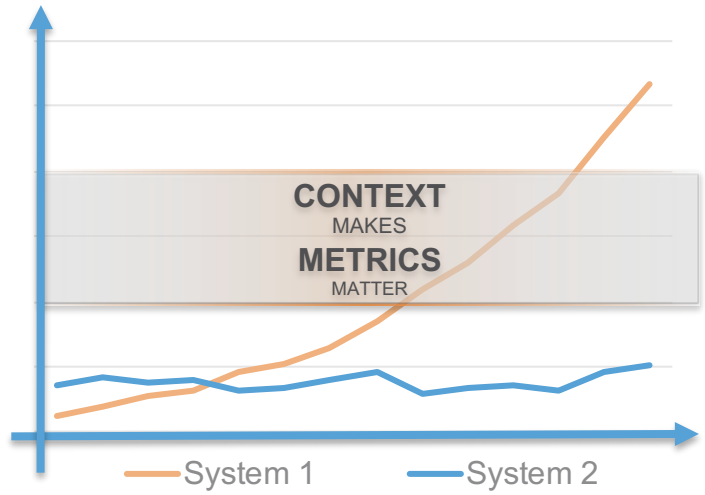
Summary



TERMINOLOGY



GRAPH FUN

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Storage Performance Benchmarking

After This Webcast

- This Webcast and a PDF of the slides will be posted to the SNIA Ethernet Storage Forum (ESF) website and available on-demand
  - http://www.snia.org/forums/esf/knowledge/webcasts
- A full Q&A from this webcast, including answers to questions we couldn't get to today, will be posted to the SNIA-ESF blog
  - http://sniaesfblog.org/
- Follow us on Twitter @SNIAESF
- Next Webcast - October 21st
  - "Storage Performance Benchmarking: Part 2"

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QUESTIONS?

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THANK YOU!