RAIDIX 4.X

St. Petersburg, Russia

RAIDIX

Who am I?

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Responsible for product strategic planning

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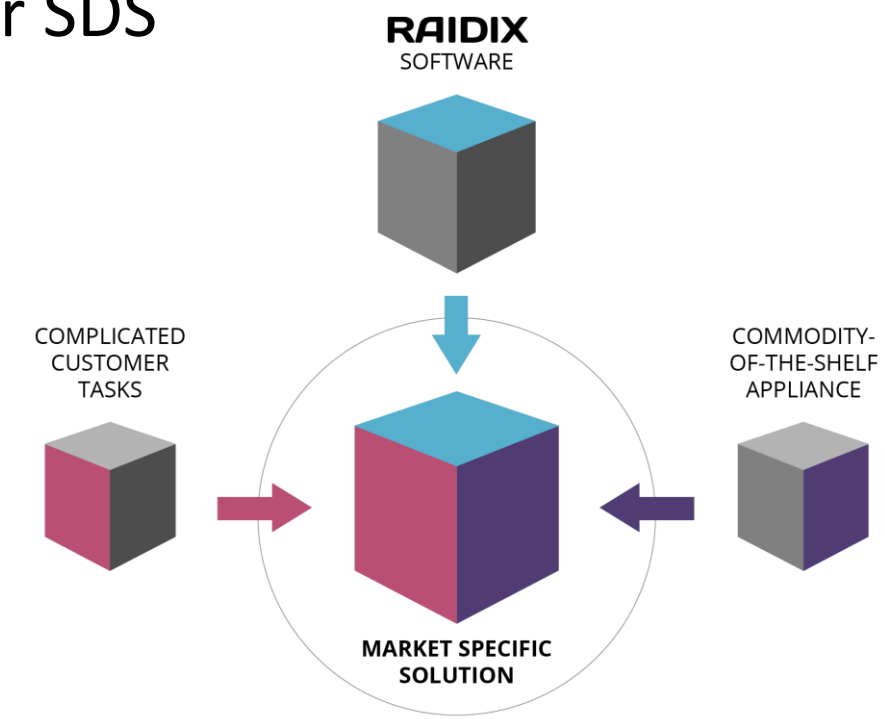
What is RAIDIX 4.x?

- RAIDIX transforms commodity HW in a **high-performance** data storage system
- 30% better cost-efficiency compared to other SDS
  - We developed the **fastest RAID** in the industry!



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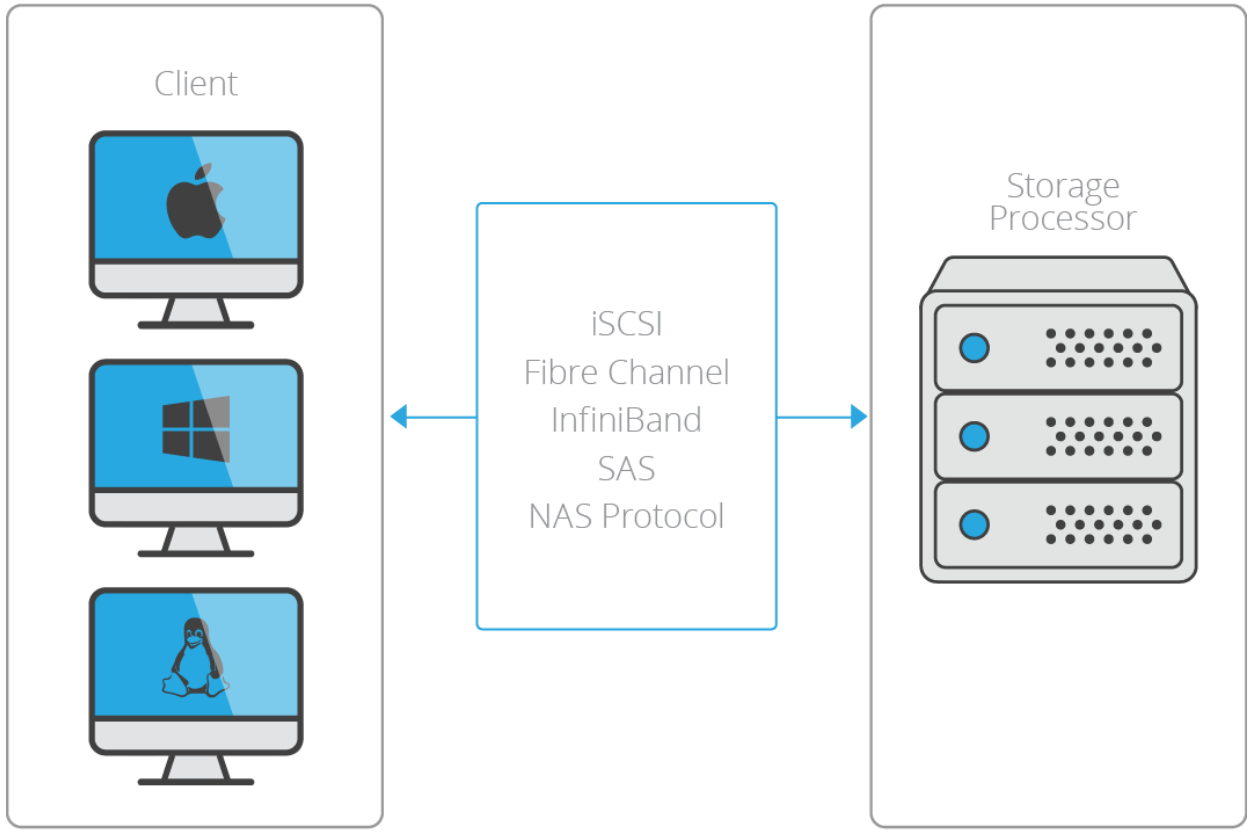
System architecture: single controller



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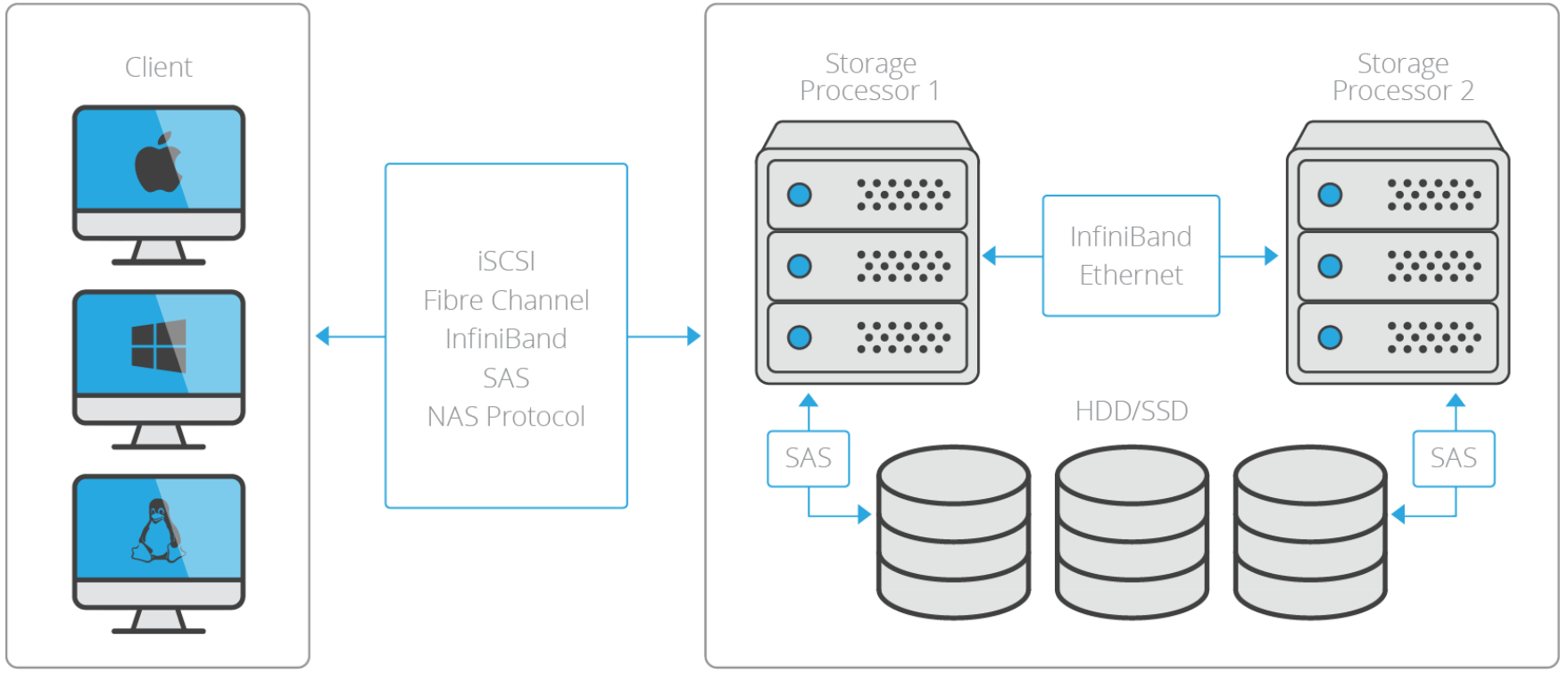
System architecture: dual controller



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Typical Solutions

Single controller entry level storage
Up to 4GBps and up to 100k IOps

Dual controller mid-range level storage
Up to 15GBps and up to 200k IOPs

Dual controller scalable storage system
Tens of GBps and Hundreds of thousands of IOps

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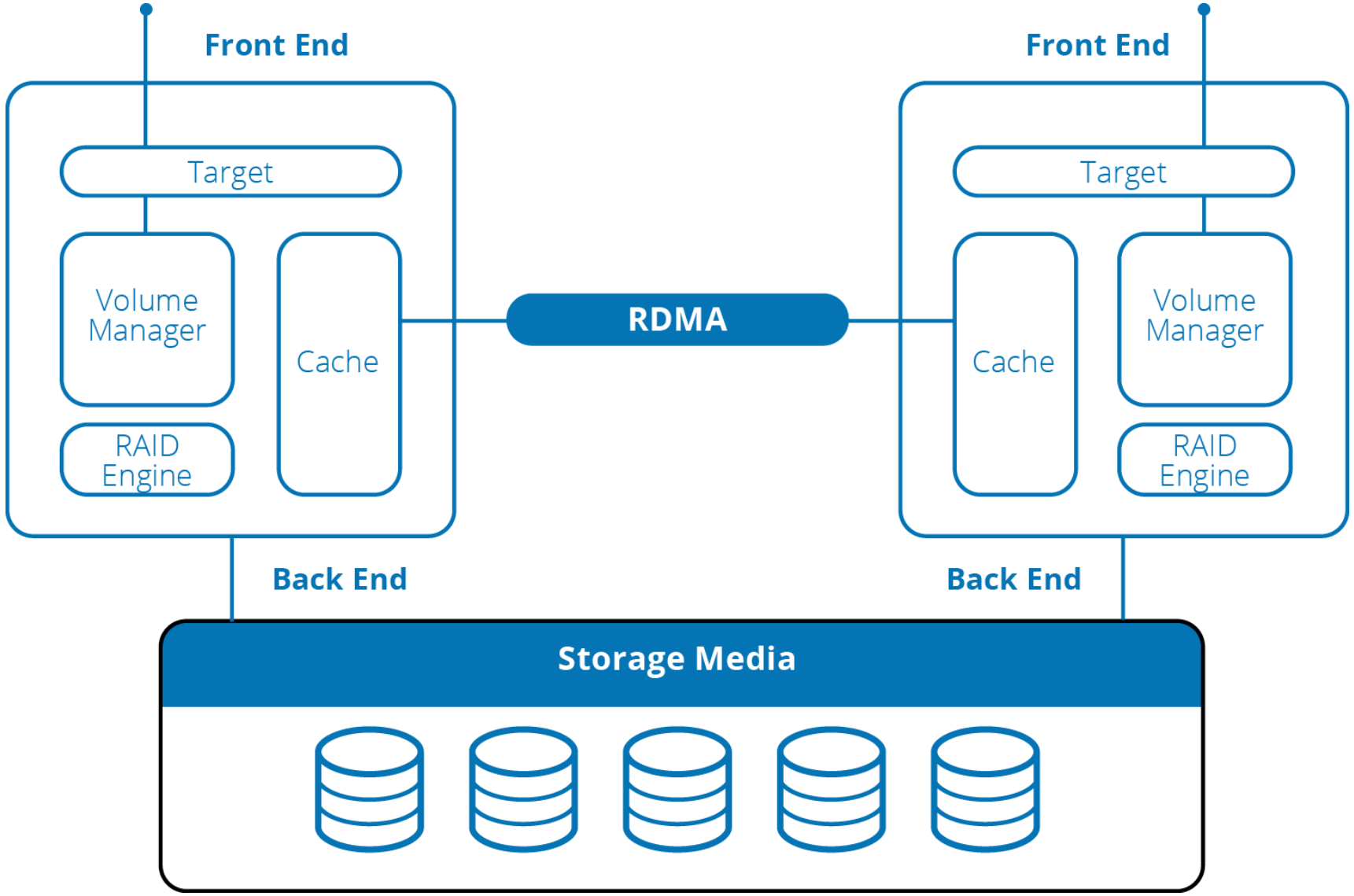

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RAIDIX 4.X Highlights

- Block Storage (FC, SRP, SAS 12G, iSCSI)
- NAS (CIFS/SMB, NFS, AFP, FTP), integration with AD, quotas
  - WORM
- RAID 0, RAID 5, RAID 6, **RAID 7.3**, RAID 10 and **RAID N+M**.
- **Cluster-in-a-box**

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RAIDIX 4.X Highlights

- L2 Caching
- **Deep Cache Tuning**
- QOS, **Smart QOS (QoSmic) – Application level QoS**
- Thin Provisioning and Deduplication

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RAID ENGINE

The RAID Engine operates with the following RAID levels: RAID 0, RAID 5, RAID 6,RAID 7.3, RAID 10 and RAID N+M.

RAID 7.3

- RAID 7.3 is the level of interleaving blocks with triple parity distribution that allows restoring data in case **up to 3 drives** fail. RAID 7.3, based on **proprietary high-performance RAIDIX algorithms**, ensures high performance levels without extra load on the CPU.
- RAID 7.3 offers higher reliability compared to RAID 6 since three drives are allocated for checksums in this scenario.

RAID N+M

- RAID N+M is the level of interleaving blocks with M checksums, based on proprietary RAIDIX mathematical algorithms. RAID N+M allows the user to choose a number of disks for checksum allocation. RAID N+M requires at least 8 disks and can sustain complete failure of up to 64 drives in the same group (depending on the number of parity disks).

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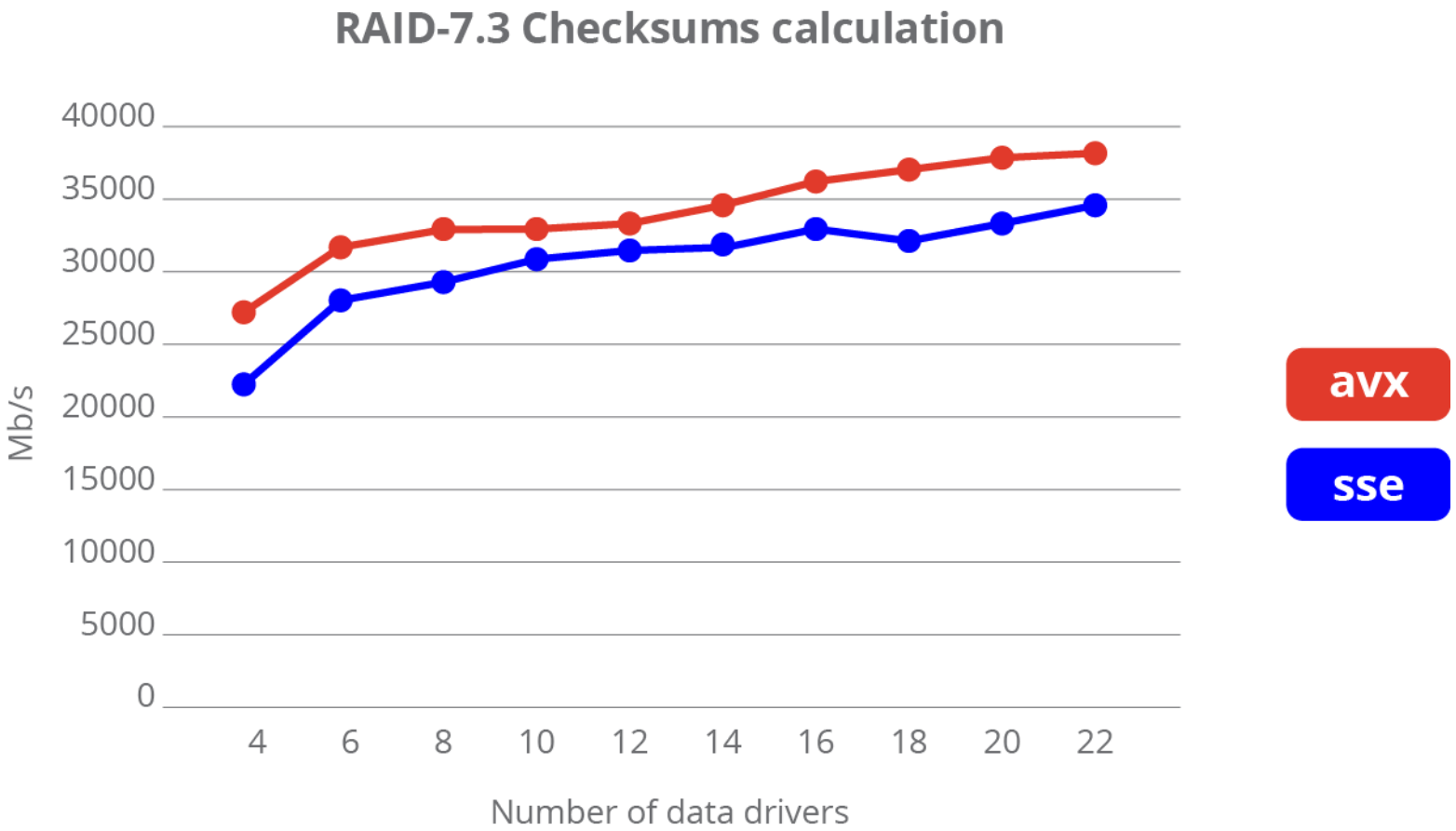

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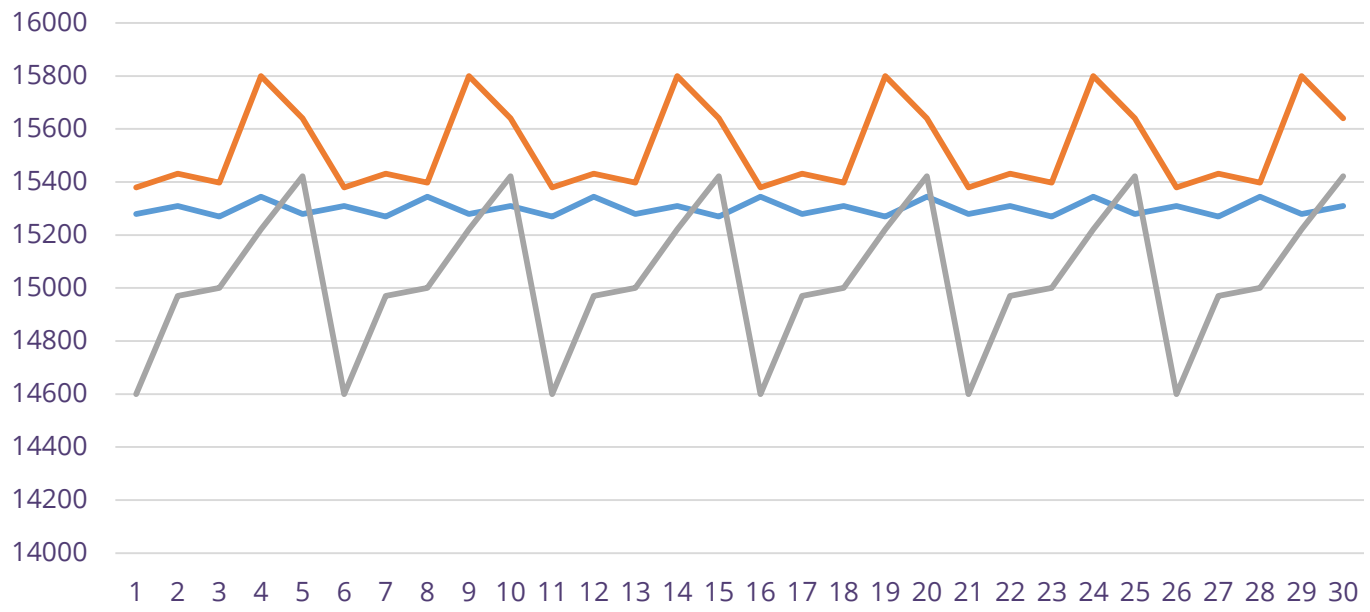
Performance remains unhindered even when multiple disks fail.



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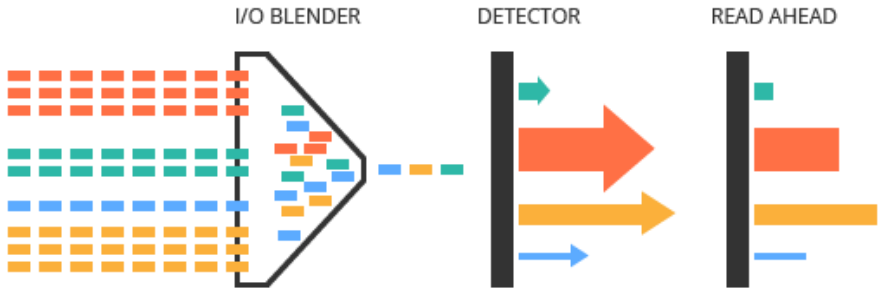
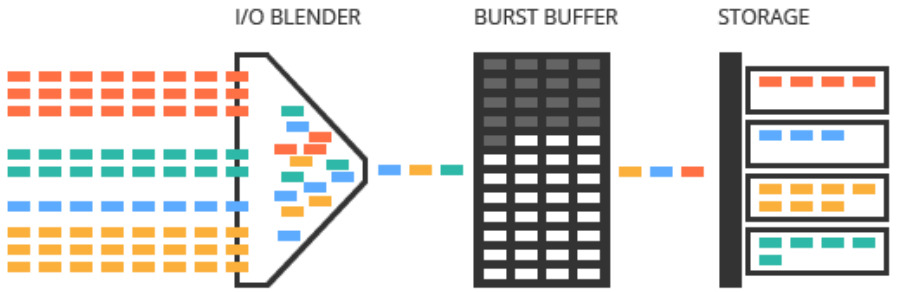
Advanced multi-streaming

ADAPTIVE READ AHEAD



BURST BUFFER



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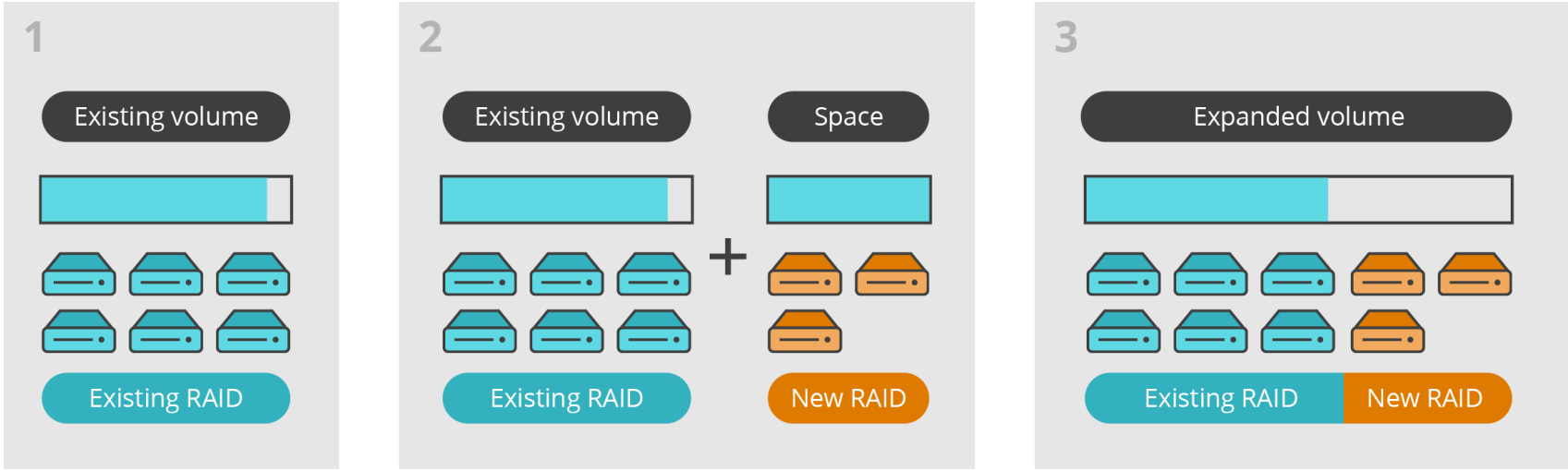
VOLUME SCALABILITY

Easy extension of existing infrastructures

During configuration, a virtual volume can be placed on top of multiple RAIDs. RAIDIX allows the user to extend volume capacity by adding new arrays to the infrastructure.



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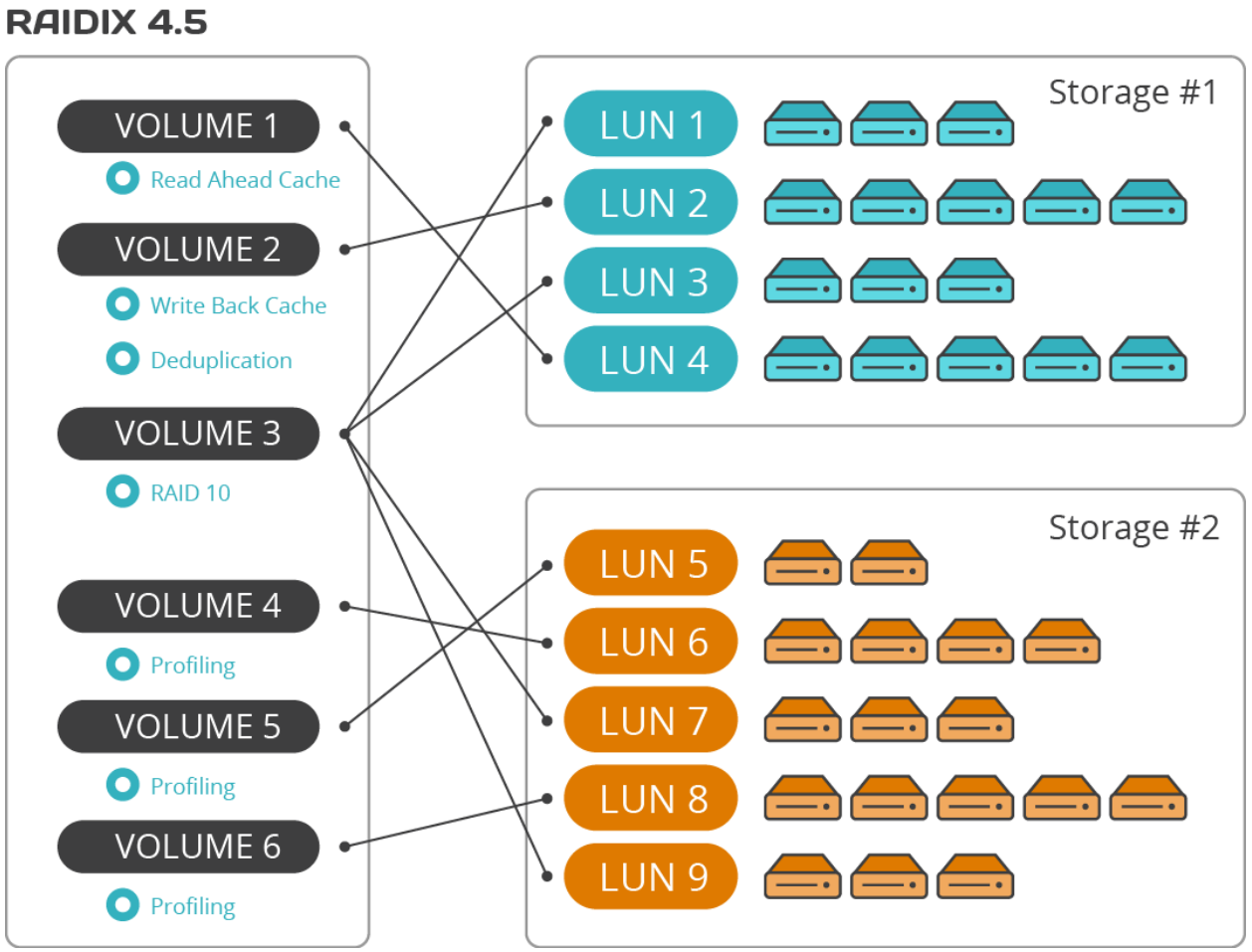
SAN OPTIMIZATION OPTIONS



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	RAIDIX	Comp 1	Comp 2	Comp 3	Comp 4
Inline Deduplication	Yes	No	Yes	Yes	Yes
Dedupe Granularity	4 KB	4 KB	Dedupes based on IO size 512 B – 32 KB	4 KB to 128 KB (64 KB default)	8 KB
Inline Compression	Yes	Yes	Partial	Yes	Yes
Dedupe before Compression	Yes	No	No	No	Yes
4 K Random IO performance RW80/20	250K	N/A*	150K	<100K	150K per node
Memory Usage	0.28 GB/TB	N/A	4 GB/TB	20 GB/TB	25GB/TB
Scalability	256 TB per pool	100 TB per node	70 TB	Limited by memory requirements	20 TB per node

Thanks for your time!

Questions are welcome!

Sergei Platonov
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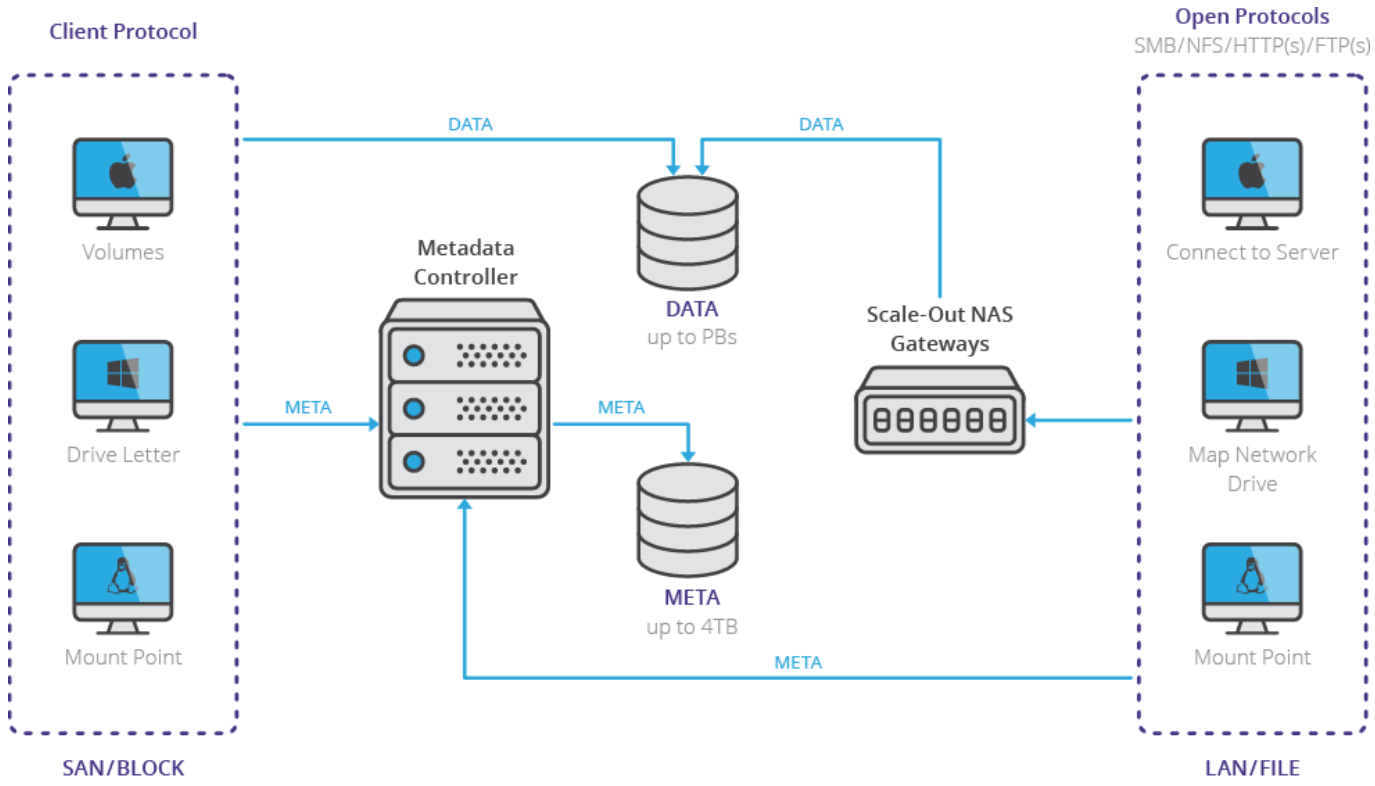
RAIDIX EXASPHERE. SCALE-OUT NAS AND SHARED SAN SOLUTION

- storage nodes presented as single pool
- Scalability: add more storage as you grow
- High performing block interfaces
- Imbedded metadata server
- Fault-tolerant configuration when reliability matters



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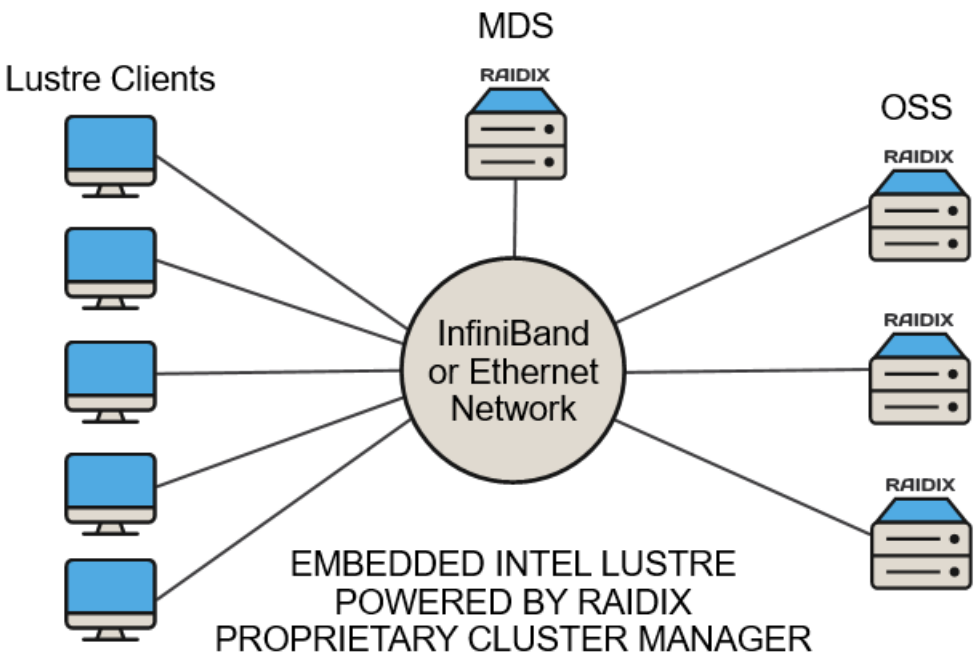
RAIDIX EXASPHERE. SCALE-OUT NAS AND SHARED SAN SOLUTION

- RAIDIX HPC/cluster-in-a-box technology + Intel® Enterprise Edition for Lustre*
- Building high performance data storage clusters
- Scalability up to 512 PB, throughput up to 2 TB/s.
- High performance, fault-tolerance and fast failover
- Asymmetric DC architecture
- Direct installation of Intel® Enterprise Edition for Lustre*, OSS+OST (Active-Active) and MDS+MDT (Active-Passive), on the storage nodes
- Lustre* services can manage volumes locally, hence lower latency and boosted performance



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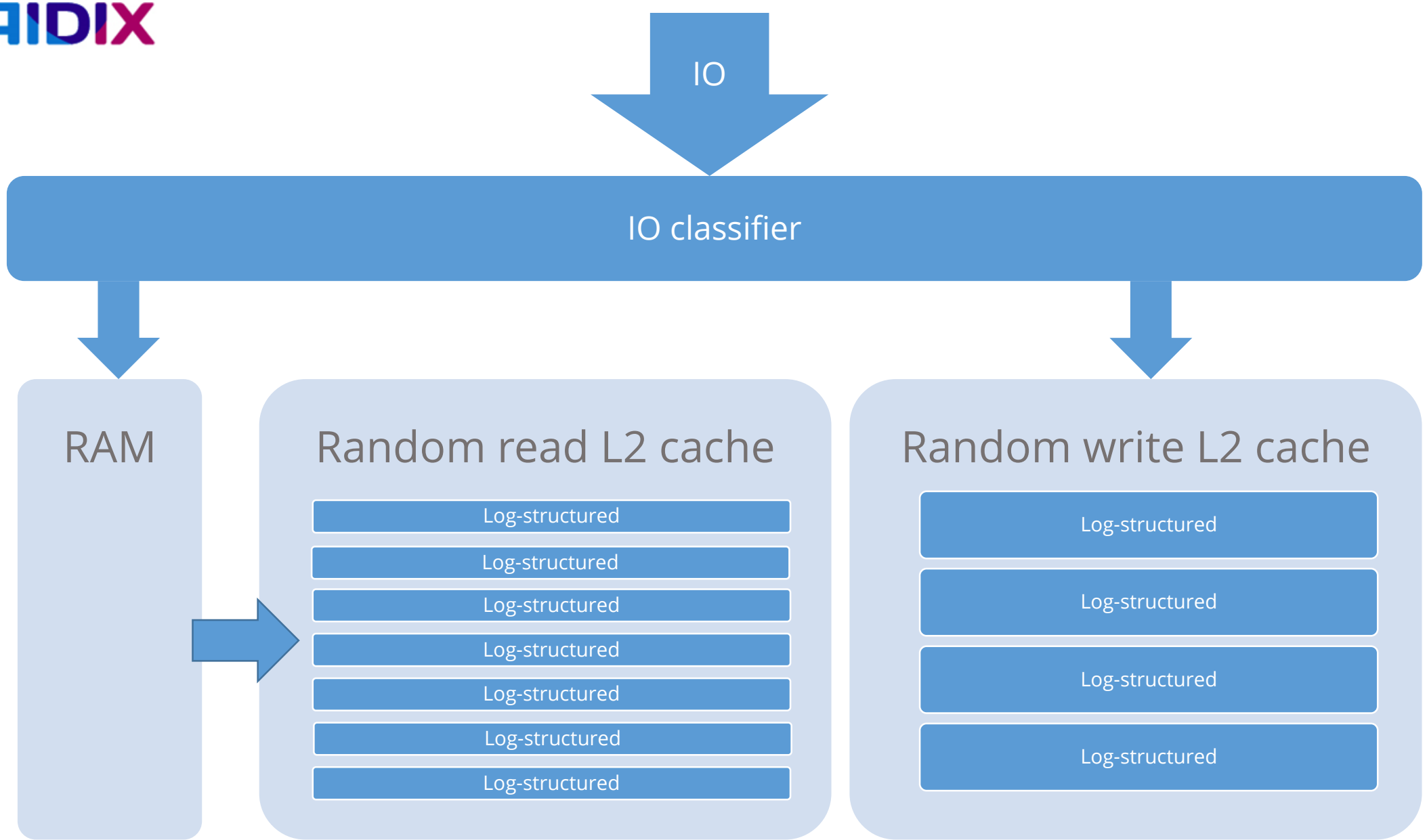

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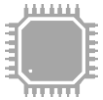
Deduplication Index

Benefits:

Fastest Index
200,000 ops/sec/core

Greatest Scalability
640 billion objects/server

Grid Expandability
Linear growth of performance and capacity



Minimal I/O
0.1% - 1000 IOs per million ops

Lowest Footprint
0.1 bytes/entry in RAM

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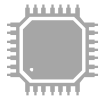
Virtual Block Store

Benefits:

Fastest Performance
Mapping layer supports up to 1.3M (4 KB) IOPS
Immediate space recovery, no garbage collection

Greatest Scalability
Up to 4 PB physical/1 EB logical



Lowest Footprint
280 MB RAM/1 TB physical storage at 4 KB granularity