Leveraging Hybrid and All-Flash Storage

About Author

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- Working as Senior Software Developer with EMC^2 Isilon India.
- Having 6 years of experience in Storage, File System and Linux Kernel.
- Major work areas: SSD caching, Online migration, Checkpoints.

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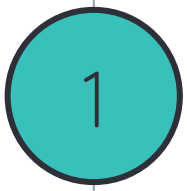
- Working as Software Developer with EMC2 Isilon India.
- Having 4 years of experience in Linux kernel and Storage technology.
- Major work areas: SCSI protocols, SCST, VAAI features & commands implementation.

Agenda

- Traditional HDD storage
- All Flash Storage
- Hybrid Storage
- Pros/Cons
- Insight
- Next Steps
- References
- Q&A

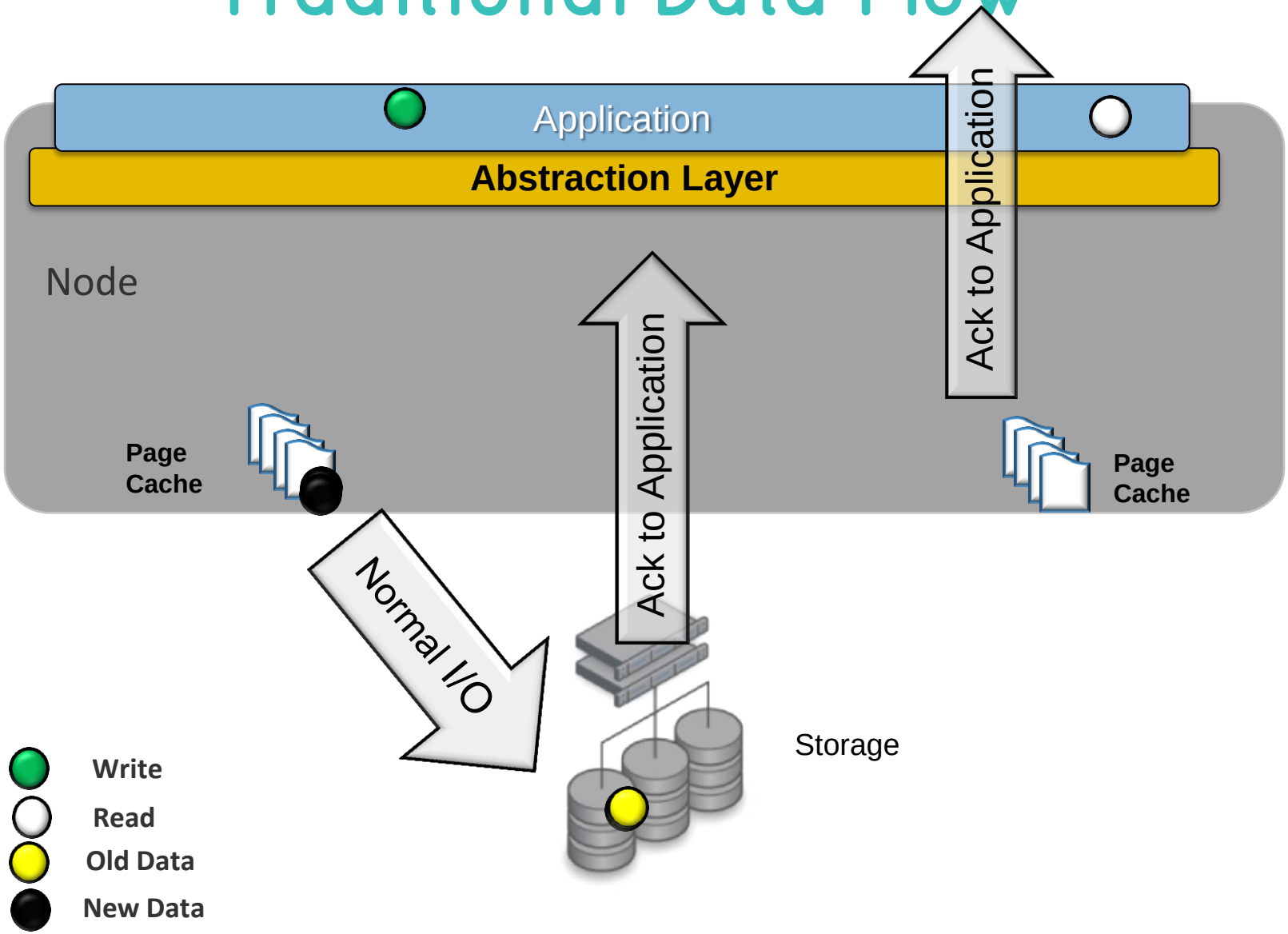
Factors Impacting the Storage Requirements

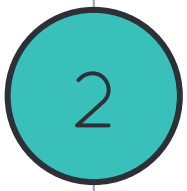
- Performance
  - * Latency
  - * IOPS
  - * Fragmentation
  - * Boot Time
  - * Cutting Edge Technologies
- Reliability
- Cost
  - * TCO
  - * Life Span
- Infrastructure
  - * Floor Space Requirement
  - * Power and Cooling



Traditional Storage

Traditional Data Flow





All Flash Storage

All Flash Storage

- **Fast**

  All flash Storage are extremely fast.

- **Latency**

  Data transfer speed.

- **Capacity**

  Rare and Expensive.

- **Reliability**

  SSDs have no moving parts to fail mechanically.

- **Software Requirement**

  New software technologies adoption.

- **Specific use cases**

  Precise use case e.g. VDI or DBs etc.

Top Myths About Flash Storage

- **It's all about IOPS.**

  IOPS are important, of course, but the reality is that all flash vendors use basically the same SSDs.

- **Flash fixes everything.**

  Many applications and scenarios where deploying flash storage is a waste of money and resources.

- **Flash drives wear out quickly.**

  Most flash drives will never reach the point where they have to be replaced.

- **Flash makes sense for only VDI.**

  Any application where there is a preponderance of I/O activities is a great candidate for flash.

- **All flash solutions are created equal.**

  Each vendor approaches flash in a different way,

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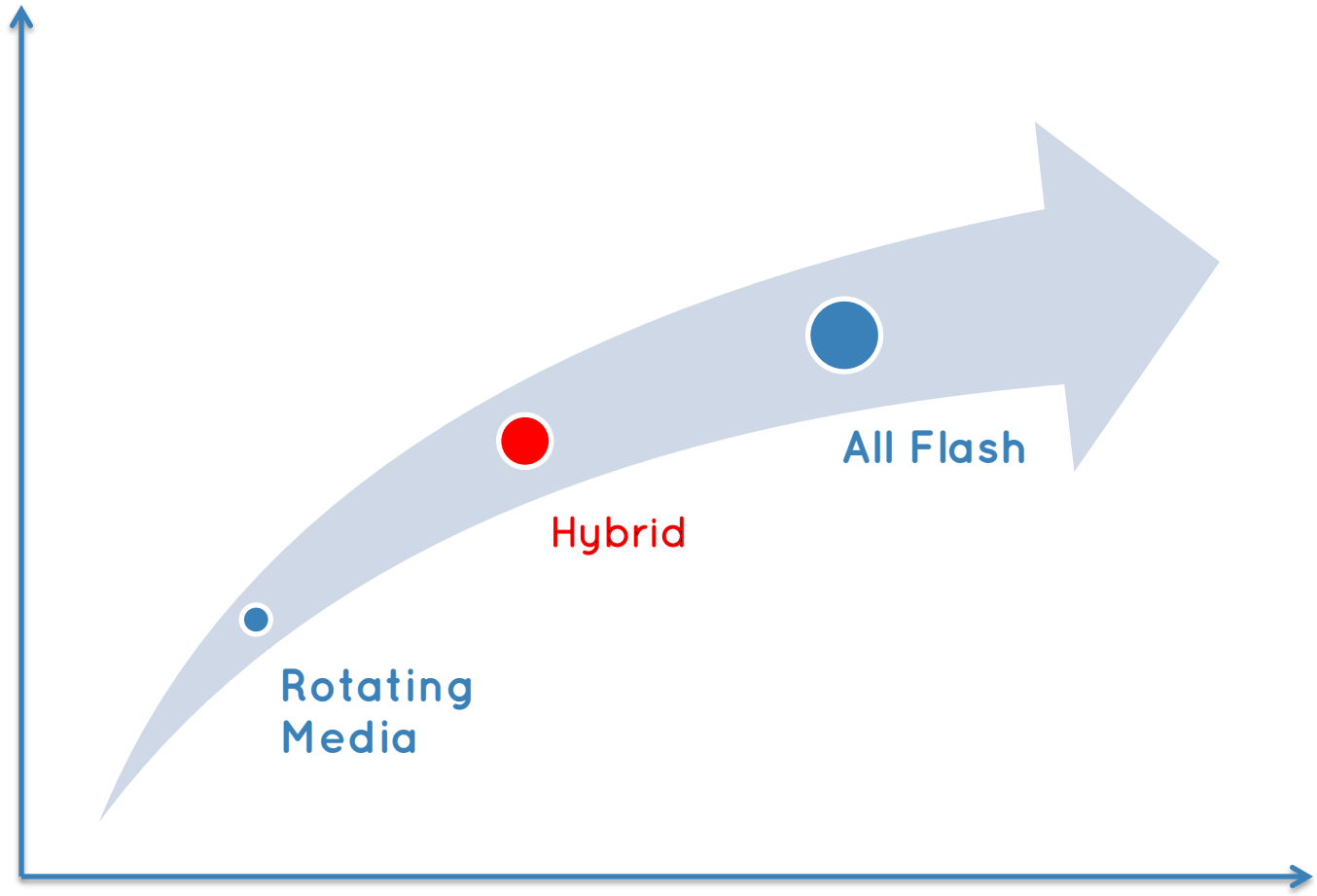
Hybrid Storage

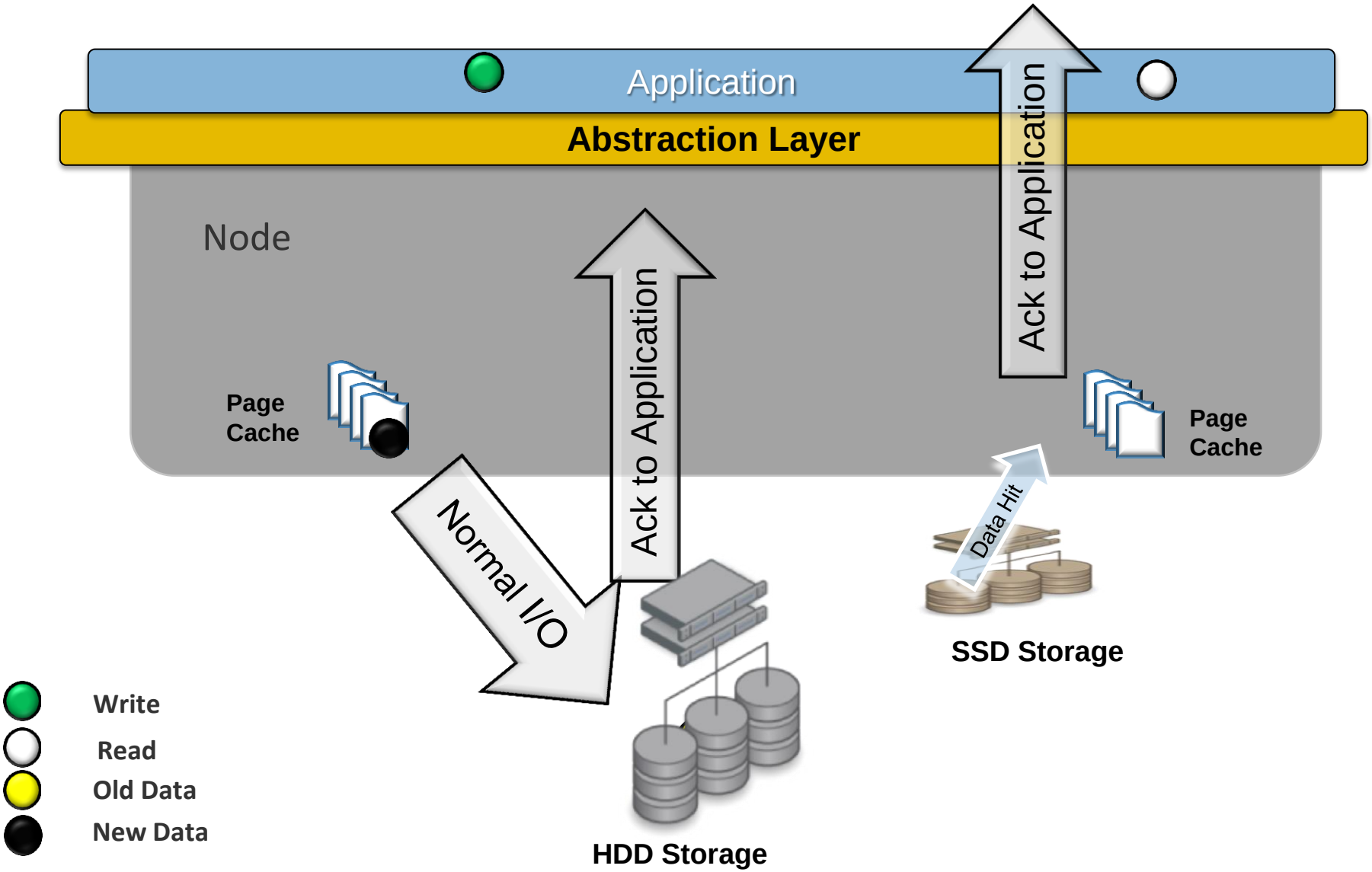
Hybrid Storage

- Mix of SSD's and HDD's.
- Small fast storage & large amount of slower storage.
- Different Architecture Design.
- Cost effective per TB.
- Certain data set is Hot.
- Performance v/s Capacity.

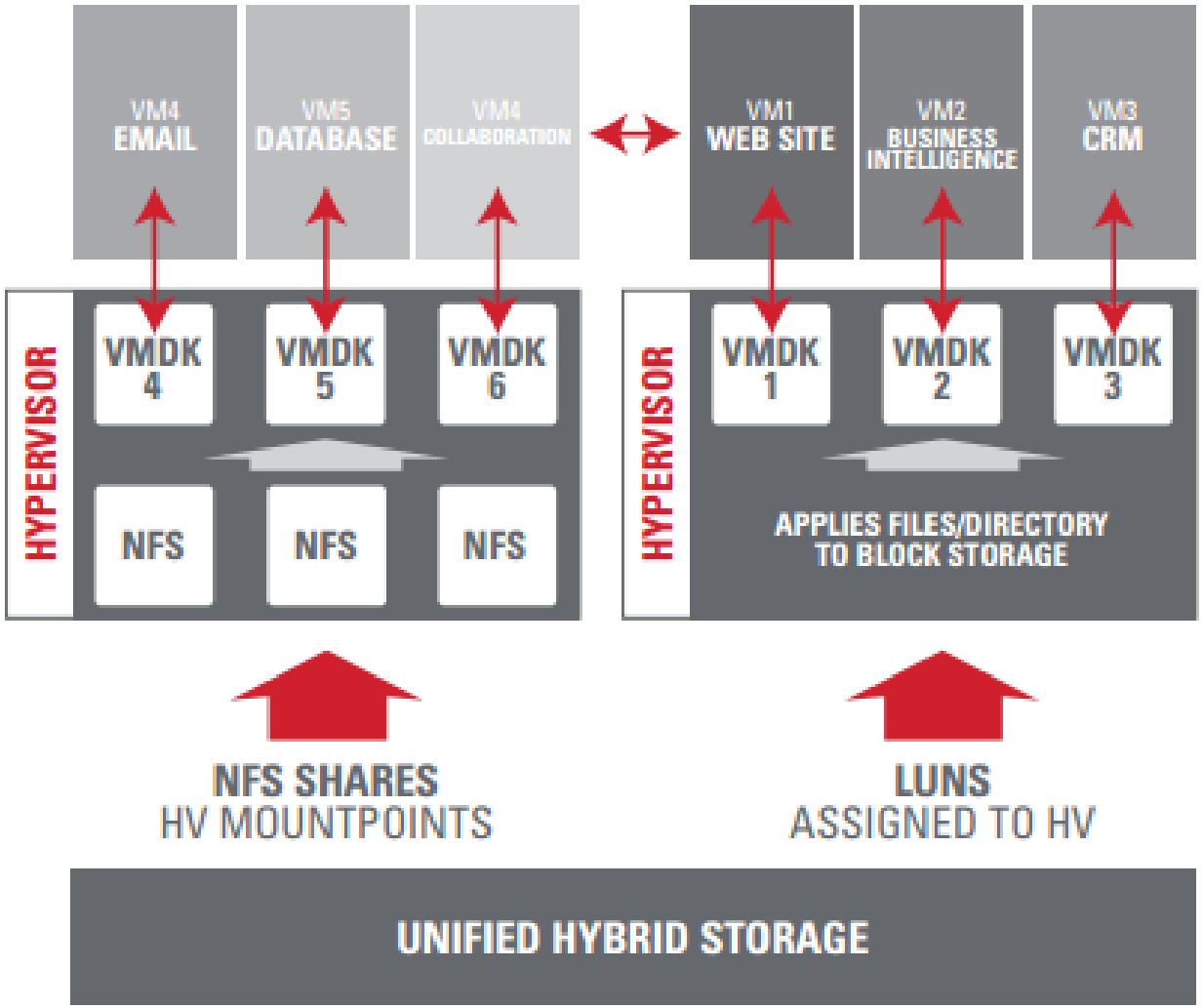
The Sweet Spot between Price and performance



Hybrid Data Flow



Leveraging Hybrid Storage



Pros & Cons

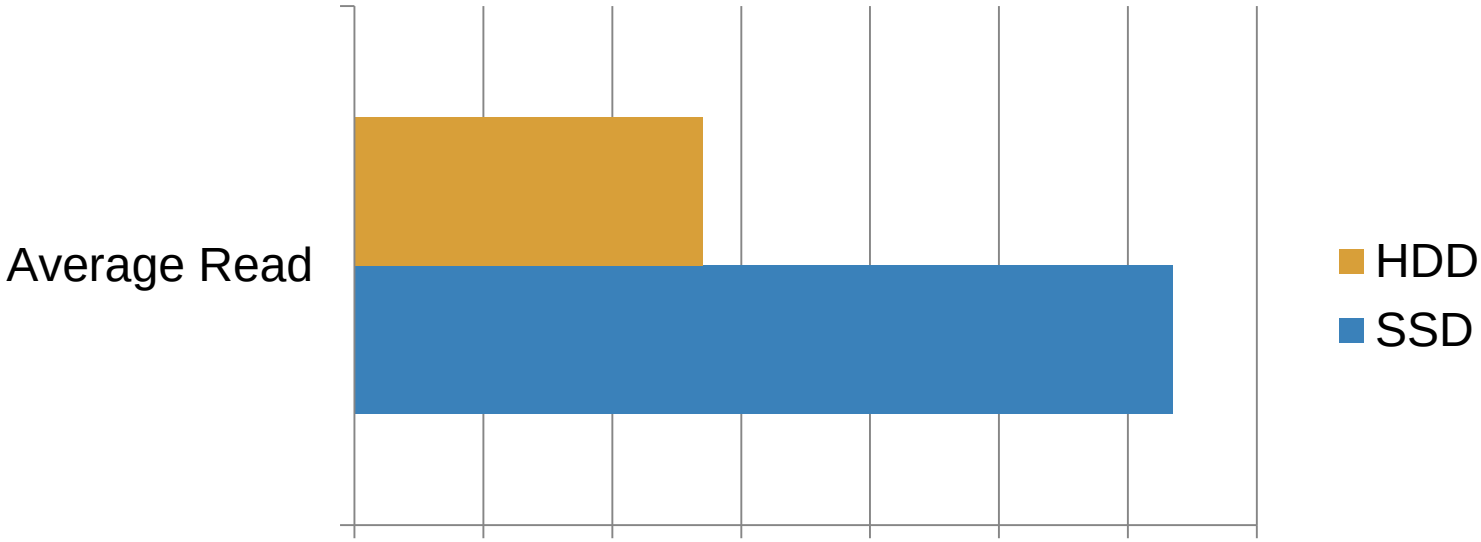
Factors	HDD	Hybrid	SSD
Speed 	☆	☆ ☆	☆ ☆ ☆
Capacity 	☆ ☆ ☆	☆ ☆ ☆	☆
Price 	☆ ☆ ☆	☆ ☆	☆
Reliability 	☆ ☆	☆ ☆ ☆	☆ ☆ ☆
Power Consumption 	☆ ☆	☆ ☆	☆ ☆ ☆

☆ = Good

☆☆ = Better

☆☆☆ = Best

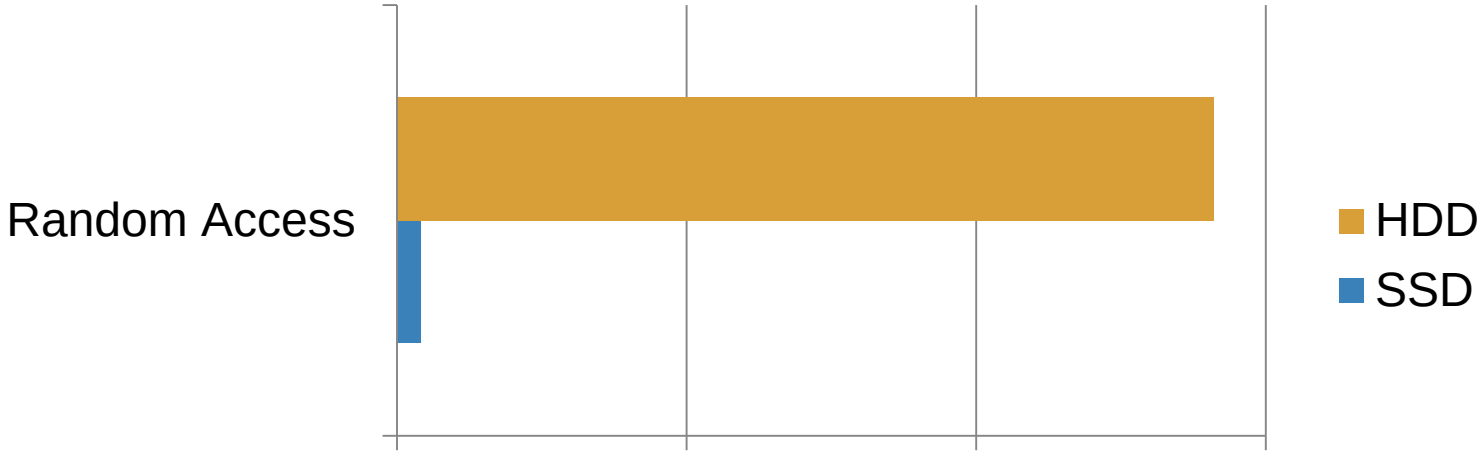
Insights



SSD reads much more MBs of data per second as compared to Hdd.

Source: Reference No 6

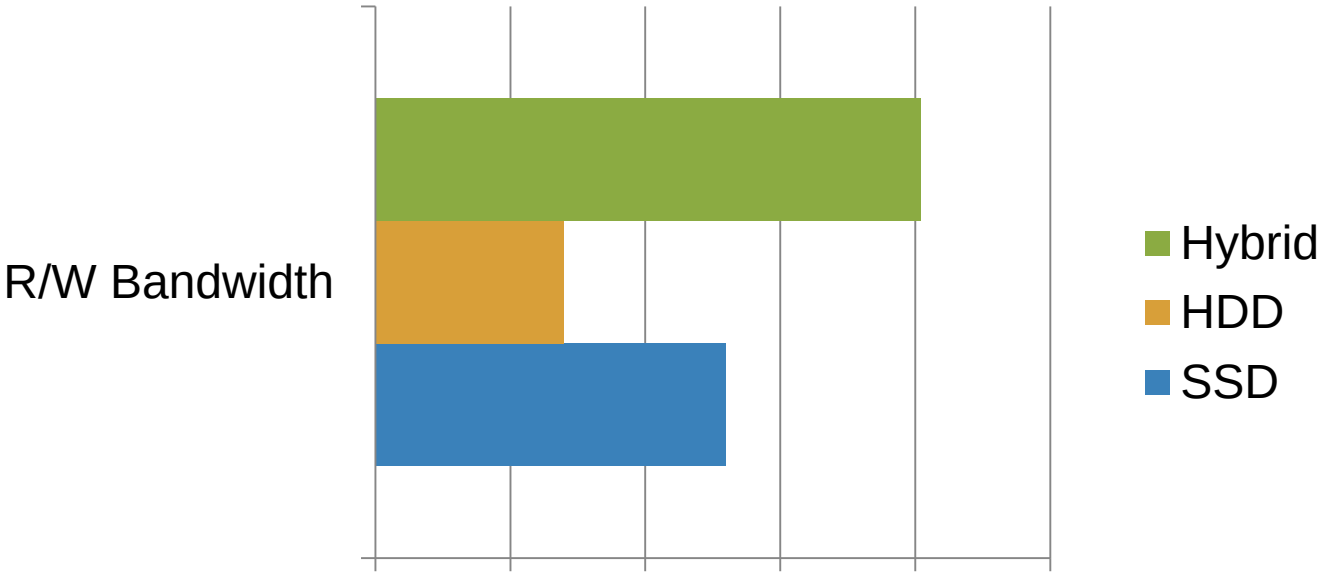
Insights



Access rate at which SSD works is much better compared to HDD.

Source: Reference No 6

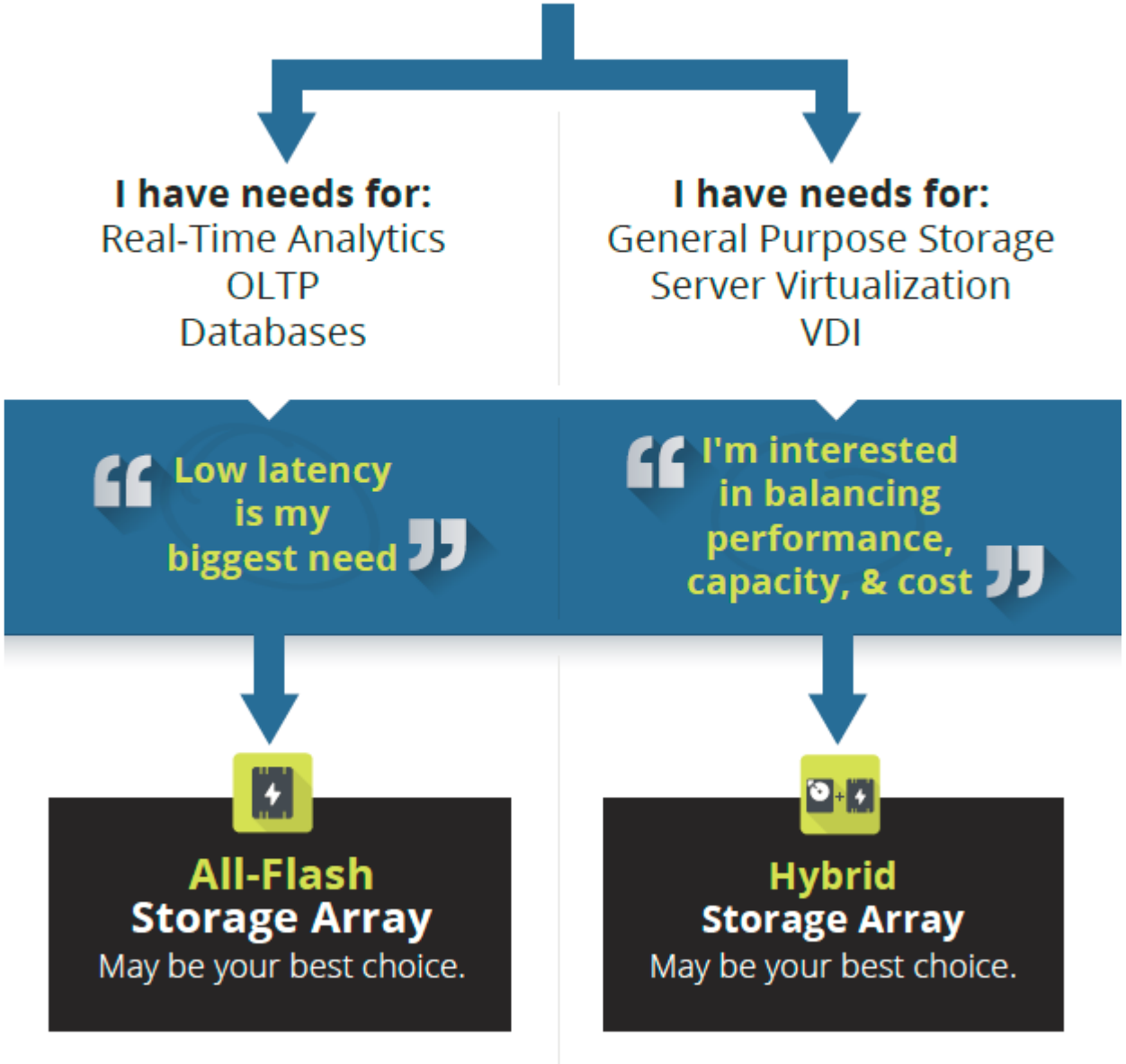
Insights



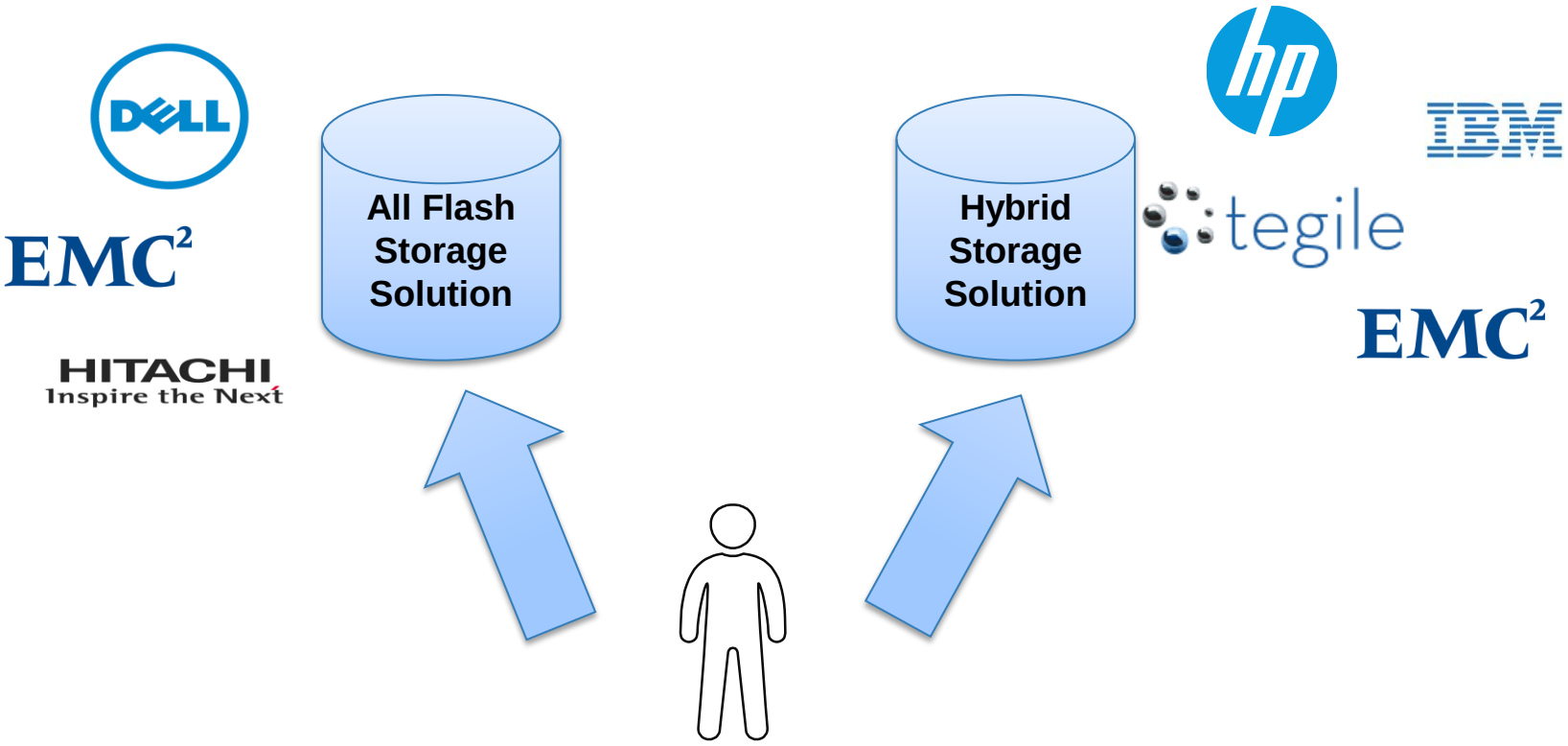
I/O bandwidth consumption in Hybrid is more

Source: Reference No 6

When to use what?



Next Steps



Foresee what is in store
Understand Your Workload
Better judge/evaluate
Choose applicable storage solution

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EMC Declares 2016 The "Year of All-Flash" For Primary Storage

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Thanks!

ANY QUESTIONS?

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