



Learn How to Select the Right All-Flash Solution for Your IT Environment

Ask These Five Questions When Reviewing a New All-Flash Solution for a Software-Defined Infrastructure

You probably have your own list of questions when assessing new all-flash solutions for your company's software-defined infrastructure. But are you asking the right ones? For example, will the solution deliver performance as good in year five as it does on day one?

The ideal all-flash solution delivers consistent performance throughout its lifetime. However, the performance of many all-flash solutions begins to slow down when they fill and overwrite data.

To help assess your all-flash options, we have identified five key questions to ask IT vendors. The answers to these questions will help you choose a solution that delivers consistent, high-performance benefits you need now and in the long term.

1 Does the all-flash solution provide both high performance and low latency?

Every all-flash vendor advertises high IOPS numbers. But IOPS is not the only part of performance that you need to consider.

Did you know that response time or latency is also used to measure performance? The faster a system can respond to requests, the lower its latency and the faster it can complete jobs. Many vendors advertise their fastest response times, which they measure in optimal conditions, but will you continue to achieve sub-millisecond response times at high IOPS levels? Ask vendors how they deliver both high IOPS *and* a low latency at the same time. Can they do this in year five as well as they can on day one?

2 Is the all-flash solution built to deliver consistent, scalable, high performance as data workloads increase?

As the storage system processes more data or is used to run additional applications, the system's stress level increases. As a system processes more requests per second (or the read/write mix changes), process times increase for each request. As a result, response times increase, and it takes longer to finish jobs for all workloads.

There are ways to mitigate this issue and keep an all-flash solution performing as fast in year five as on day one. By using custom flash modules that are designed to have more performance than solid-state disks (SSDs) and keep latency low under heavy processing loads, you can gain significant performance advantages.

Another way to alleviate flash performance issues is through advanced quality of service (QoS) solutions that prioritize workloads to access more or fewer system resources, as required.

What Analysts Are Saying



"Hitachi's product portfolio and reputation for building reliable storage systems, as well as the vendor's R&D investments, are aligned well with storage market and technology trends."

Source: *Magic Quadrant for General-Purpose Disk Arrays*, Gartner, Inc., October 21, 2015

3 Does internal “garbage collection” impact performance?

Despite its performance advantages, flash isn't as easy to erase data from as disks, and internal cleanup can also cause performance issues. To rewrite flash, there is a multistep process for “zeroing” the flash cells so they can be written to again. This process takes time and will slow down the system.

Flash devices have ways to minimize this impact, but, over time, slowdowns will occur. And when the system is doing cleanup, especially under a heavy load and when data changes frequently, IOPS drops and latency increases. These actions seriously impact performance unless the system is architected to address the issue.

Ask if a solution offers a multiqueuing architecture that allows prioritization of customer I/O over background cleanup tasks, or other unique things a vendor may offer to prevent slowdowns as flash storage fills up.

Learn How All-Flash Solutions From Hitachi Can:

- ✓ Accelerate business decisions.
- ✓ Enable IT agility.
- ✓ Gain competitive advantage.
- ✓ Lower data center costs.
- ✓ Drive simplicity and efficiency.
- ✓ Delight your customers.

4 Do data reduction technologies that lower flash costs also lower performance?

Any process running on a flash array requires resources. The more intensive the process, the more resources it requires. Inline processes, unless they are hardware accelerated or given dedicated resources, will impact performance. Some vendors design their system with unique capabilities to handle this impact or allow you to toggle data services on and off to minimize the load. When choosing a solution, make sure you understand how it balances performance with delivering increased capacity. Sometimes performance can be cut in half when running efficiency technologies, which is detrimental.

Hitachi Virtual Storage Platform (VSP) F series offers selectable deduplication and compression that can be toggled on or off, to achieve an optimal balance between performance and data reduction efficiency. Some workloads only benefit from deduplication or compression. In addition, the VSP F series has hardware-accelerated capabilities running directly on its flash modules. These capabilities provide two key benefits:

- ✓ First, the hardware-accelerated compression of VSP F series flash module drives (FMDs) distributes the load across all flash modules and puts no load on the storage controllers.
- ✓ Second, the compression numbers are on and always running, so there should never be a penalty.

This no-penalty architecture, plus the distribution of tasks away from the controller, keep performance high, even as data is compressed. If performance numbers are based on compression always running, you will know the performance level to expect even as data is compressed.

What Customers Are Saying



“We were looking for a reliable and capable partner at Gati KWE to help us with our storage technology refresh. We needed someone who could work with us to retain elements of the legacy system while adding critical components that would support us completely as the business grew...”

G. S. Ravi Kumar, Chief Information Officer, Gati Limited

5 How does the solution help track overall workload performance?

Every application environment reaches a point where it hits its limit. That's inevitable. When this happens, you need to determine if it is time for a storage system upgrade or if a different part of your environment needs to be adjusted. A solution should be able to monitor the storage performance to help you predict and plan for upgrades. By understanding the performance of a system and how it changes over time, you can plan for upgrades and new system investments, to keep its performance as good in year five as on day one.

It's also important to understand that performance bottlenecks are not always because of the storage system. For example, application performance may suffer due to overwhelmed server architecture or a network issue. In these cases, it's important to have tracking software that can look beyond the system to determine when and where issues are occurring. With this information, you can compare what the application, host and storage are seeing to fix the problem.

Accelerate Your Business With Hitachi All-Flash Solutions

By asking these questions, you will learn that all-flash solutions offer many benefits for today's enterprise. But if they aren't designed with features that deliver consistent performance long term, they won't provide the expected advantages you need over traditional storage.

[Learn about our industry-leading guarantee that will help you reach a 2x increase in data capacity, with 100% data availability.](#)

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