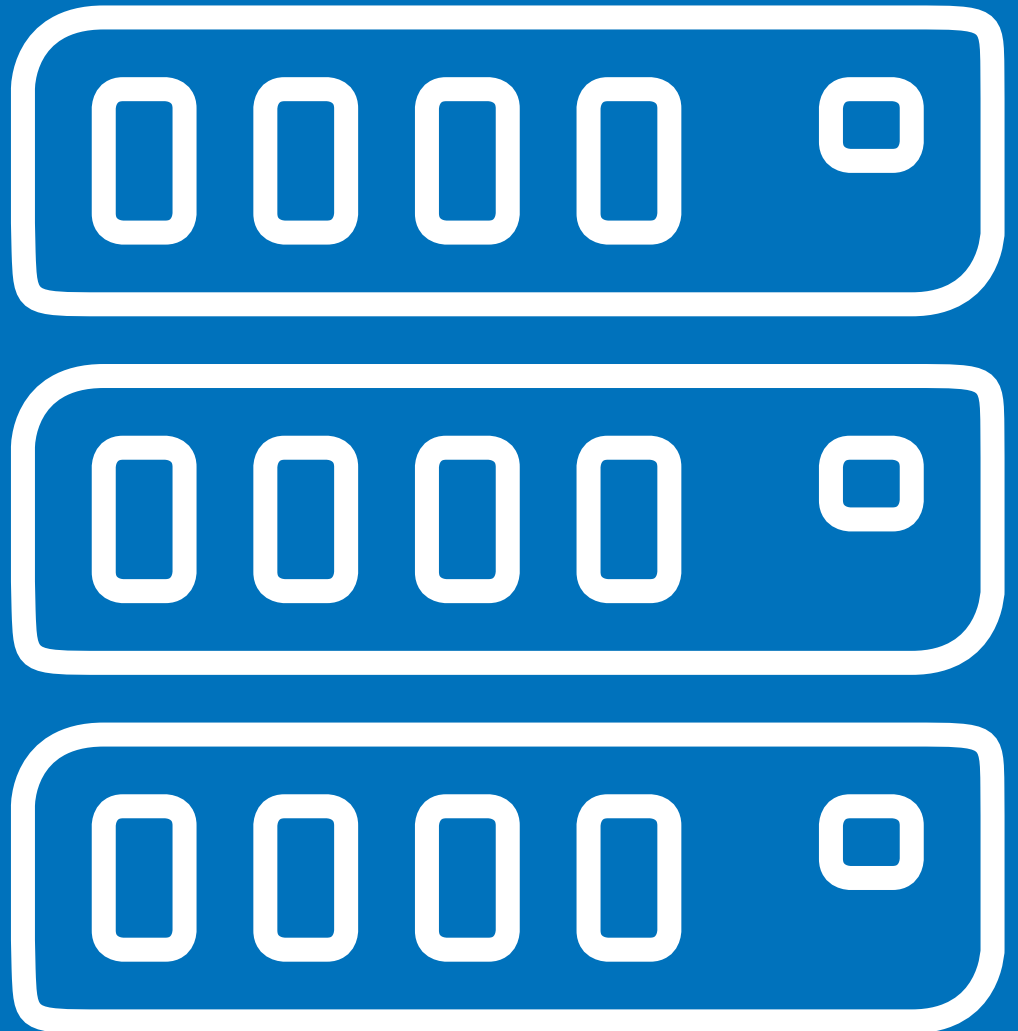


REAL USERS SPEAK: TAKING ADVANTAGE OF NETAPP FLASH FOR SAN

Learn When and Why to Migrate Your Workloads

PeerPaper Report



BASED ON REAL USER REVIEWS OF NETAPP FLASH SOLUTIONS

ABSTRACT

Flash storage is now the storage media of choice at the core of Storage Area Networks (SAN systems). This paper looks at what it takes to succeed when deploying all-flash arrays in a SAN environment. It provides practical guidance for deploying all-flash for workloads such as Oracle, SAP and SQL Server based on the experiences of IT professionals who use NetApp all-flash storage systems. The insights go beyond the basic, “It’s fast!” to explore topics such as transaction processing speed, storage management, future requirements planning, workload migration and more.

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INTRODUCTION

What does it take to get the best results from an all-flash Storage Area Network (SAN)? This paper provides answers based on the insights of real users. Taken from the experiences of IT professionals on IT Central Station who use NetApp All Flash FAS (AFF), it offers practical guidance for deploying all-flash SAN systems for workloads such as Oracle, SAP and SQL Server. As flash storage becomes the storage media of choice for SAN systems, it's essential for storage managers to grasp the importance of transaction processing speed, storage management, future requirements planning, workload migration and more.

Overview: Why SAN Systems are Moving to All-Flash

Storage managers are increasingly shifting their SAN systems to all-flash. This move has several drivers. For one thing, the cost of flash continues to fall. Once considered a “luxury” for high-performance workloads, flash is now viable, financially speaking, across a wider range of use cases. Flash technology itself has also improved. It can now deliver consistently high performance even in a very large SAN environment. At the same time, flash SAN management platforms have gotten better. All-flash SAN systems also contribute to lower data center operations costs. As

Figure 1 suggests, they reduce the physical storage footprint. As a result, space requirements for storage, along with power and cooling costs, come down.

Insights from Real Users

Understanding the business aspects of workloads and knowing how and when to reduce latency factor into the recommendations made by expert users on IT Central Station. Their experiences reveal the importance of planning for future needs and knowing when and how to move workloads. Simplified storage administration also emerges as a success factor for all-flash SAN systems.

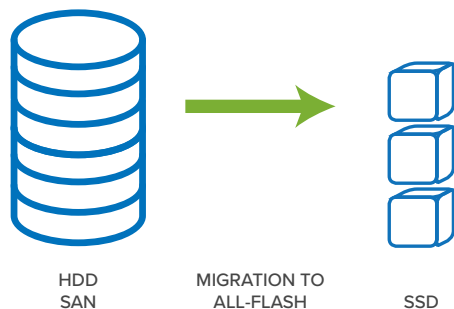


Figure 1 - The impact of migration to all-flash SAN includes a reduction of physical storage footprint and power requirements.

IDENTIFY YOUR BUSINESS AND WORKLOAD NEEDS

Achieving a high Return on Investment (ROI) from an all-flash SAN means thinking through the business side of the investment decision up front. Some workloads are more suitable, given an organization’s particular business. A [Service Design Engineering](#) user at a tech services company with over 10,000 employees recommended finding the all-flash solution for the “business problem you’re trying to solve initially.” In his experience, a single all-flash SAN won’t do everything for everyone. As he said, “It depends on what your application is and what you’re doing.”

Your requirements may vary depending on your application. For example, for a SAN running Microsoft SQL Server, an incremental approach may be best. An [IT Manager](#) at a wholesaler/distributor with more than 500 employees advised not trying to think of NetApp AFF in overly complex terms in the beginning. He shared, “Think of it in terms of what you want it to do and what the business needs it to do rather than putting the kitchen sink in it at the start.”

Oracle users recommend gaining a thorough understanding of workloads so it’s possible to set proper thresholds and performance criteria. A [Systems Manager](#) at a university with over 1,000 employees further suggested, “Understand what your support service needs are. Is that important? How important? It’s not always about cost. We found that in all those areas, with our evaluation, NetApp was a clear choice for us.”

KNOW WHEN AND WHY TO MOVE WORKLOADS

All-flash costs have come down, on a per GB basis, but the decision to move a workload still needs to be evaluated on a case by case basis. Not all workloads will benefit equally from being moved to all-flash. A [Storage Architect](#) at an insurance company with over 1,000 employees strongly recommended looking at migration plans before making a purchase decision. In this same spirit, an Oracle-using [Storage and Unix System Administrator](#) at a financial services firm with over 50 employees related, “We need to be judicious in what we cut over. The smaller database environments are a given.” He then added that they’ll also move selected, performance-sensitive VMware workloads to all-flash SAN.

This user had been relying on SAS and SATA. Now he gets “quite satisfactory throughput” on his Oracle environment using all-flash. In his case, they migrated from spinning disks to a clustered storage system based on newer hardware and a smarter back-end aggregate design. He attributed his success partly to implementing NetApp best practices for all-flash SAN systems.

REDUCE LATENCY TO BOOST PERFORMANCE

IT Central Station members expressed pleasure at how their all-flash SAN systems can reduce latency to boost performance. One user, a [Senior Storage Engineer](#) at a comms service provider with over 1,000 employees shared how he has improved his transaction processing speed by moving from direct-attached HDD storage to an all-flash SAN. As he put it, “Latency has been almost eliminated on protocol and physical disk layer.”

SQL Server users are now achieving [sub-millisecond latency](#). The same appears to occur with SAP, as a [CTO](#) at a tech services company with over 1,000 employees noted. Remarking that speed is the most important feature of his all-flash SAN, he explained that moving SAP to NetApp AFF reduced query time for his warehouse database.

Legacy system operators also benefit. A [Sr. System](#)

[Architect](#) at a retailer with over 1,000 employees has shifted his non-virtualized AIX-based Oracle and DB2 databases to all-flash SAN systems in order to get “the high performance and low latency that the retail application requires.” Factors affecting latency include block size, the number of ports and the number of solid state drives (SSDs) in the actual physical enclosure. Figure 2 depicts the potential variability of latency by workload.

EMBRACE ALL-FLASH STORAGE EFFICIENCY FEATURES

Experienced storage managers understand that the reduced footprint of an all-flash SAN can be taken even further with storage efficiency. Oracle and SAP users, for example, are benefiting from [inline compression](#), inline deduplication, and other inline space-saving features without sacrificing performance.

For a [System Engineer](#) at an engineering company with more than 500 employees, the best approach was to stay true to an initial storage efficiency plan, regardless of feedback he received from others in his group. As he said. “Try out what you actually want to do, because that’s actually the problem we had; some of our people swore up and down that NetApp wouldn’t be able to do compression at the new rates that they got, or that we got. They said that Oracle doesn’t compress and so on. We ended up getting them to stick some of their machines on our NetApp, and we showed them that you actually do get it.”

SIMPLIFY DATA PROTECTION AND STORAGE MANAGEMENT

Storage administration is a critical success factor for the adoption of all-flash SAN systems. Oracle users, for example, emphasized the importance of [ease of management](#) and simplicity in [data protection](#). A [Lead Systems Engineer](#) at a healthcare company with over 1,000 employees framed the issue like this: “When choosing a storage [solution], it’s a matter of management. Once you’ve bought the storage, all your time is spent in management. So, look at the software as well as the hardware.” A [Storage Technical Lead](#) at a tech services company with over 1,000 employees explained how he used an ONTAP cluster for his core Oracle databases, taking advantage of FlexClone “to clone and restore the DBs every day and to check if backups are properly done.”

TRY TO FORECAST HOW MUCH PERFORMANCE YOU WILL NEED

How much performance is enough? As with any technology investment, the more accurately the requirements can be forecast, the better the payoff will be. And, as it often happens, each organization will have different needs. For instance, a [Storage Administrator](#) at a tech services company with more than 500 employees is serving nearly a trillion transactions per month in SQL and getting sub-millisecond performance. Not everyone is at this scale, however.

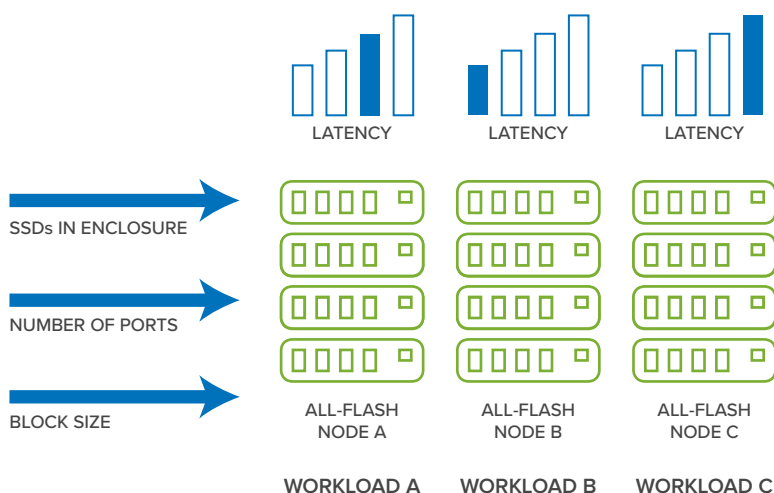


Figure 2 – It is possible to reduce latency to boost performance, though different workloads may require varying levels of latency for a suitable performance level.

Predictability of performance also counts for a lot in industries like oil and gas, which operate on a 24/7 basis. An [IT Consultant](#) in this sector, who uses NetApp AFF for SQL, Oracle and SAP, found that an all-flash SAN has made his operation more efficient. They rely on the solution's consistently high performance, explaining, "We cannot stop for any reason, because we need to produce oil, always." Others in the [energy industry](#) recommend forecasting performance to meet projected application data retrieval speeds.

IT Central Station members work to align the Input/Output Per Second (IOPS) of their all-flash SAN systems with requirements for high availability. A [Senior Systems Administrator](#) at an insurance company more than 500 employees explained, "When you have high-availability applications that need high IOPS, it's kind of a no-brainer to have an AFF. We're using it for some SQL databases now, and a VDI solution."

Other members emphasized performance forecasting for [transactional database workloads](#). A [Director, IT](#) at a tech services company with over 1,000 employees noted, "We decided to use the All-Flash because of speed. Most of the time, when we looked at the SAP [HANA] database, what we found was, by using the All-Flash, we got almost 100% improvement on our jobs. With SAP databases, there's significant performance improvement."

PLAN FOR THE FUTURE

Data growth is relentless. It takes planning. That's a given. The question, though, is how much capacity will your all-flash SAN require moving forward? A [Systems Analyst](#) at an energy/utilities company with more than 500 employees recommended doubling any current plan for Oracle and SQL workloads. A [Lead Storage/System Engineer](#) at a financial services firm with over 1,000 employees suggested, "Decide your current and future requirements in terms of performance, capacity scaling, application (SQL/Oracle/SharePoint/Exchange/SAP) integration, storage efficiency (dedupe/compression), operational overhead, etc., and decide on a vendor based on it."

Careful planning of capacity needs and software capabilities may replace a "purpose-built" philosophy

when it comes to choosing an all-flash solution. As a [Storage Administrator](#) at a retailer with over 1,000 employees framed the issue, regarding SQL, "We have five different brands of arrays. You can't become an expert in something if you have five different arrays to work with. I think we're taking our shotgun approach and we're kind of moving it down to where you can be more specialized in what you do. As I've mentioned, NetApp is fantastic; it does block, it does NAS. It's a one-stop shop." Similarly, it's often beneficial to plan for both [NAS and SAN protocols](#) from the same solution.

“Decide your current and future requirements in terms of performance, capacity scaling, application integration, storage efficiency (dedupe/compression), operational overhead, etc.”

In some cases, the option of using professional services may provide the best outcomes when deploying an all-flash SAN. Ideally, an all-flash system should be simple enough to set up without outside help. However, not all organizations have the resources. And, an experienced outside pair of eyes may be able to guide planning for the future better than an internal team.

Speaking to this point, a SQL-using [Director of Network Operations](#) at a real estate/law firm with over 1,000 employees said "Definitely use professional services, because there are a lot of moving parts and they can guide you through the best practices. If you are going to do it, give your current performance metrics to NetApp or whoever else, so that they can see how much storage you're using, how much it would be if it went through the dedupe scenarios and also what your response time should be at the end of everything."

CONCLUSION

Making the move to all-flash SAN systems is fairly intuitive. The performance is there. The reduction in physical footprint is there. However, achieving the best results, the strongest ROI, takes thinking beyond the basics. As IT Central Station members share, following practical suggestions can make a difference in the outcomes of all-flash SAN for Oracle, SAP and SQL Server workloads. Tips include factoring transaction processing speed into storage plans, focusing on storage management, carefully planning for future requirements, concentrating on the how and why of workload migration and more.

ABOUT IT CENTRAL STATION

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