A SolidFire Insight

The Benefits of an All-Flash Scale-Out Storage Infrastructure

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There are many decisions to make when considering a storage system for the data center, but the one that takes center stage is scope. Will that storage system be a point solution solving a pressing need, or will that system be used as a platform to consolidate multiple storage silos into a single system? Conventional wisdom dictates that the scope drives the plan. But a point solution approach suggests a scale-up design, whereas broader strategic thinking leads to a scale-out architecture and datacenter transformation.

Scope: Triage Versus Strategy

The reality of the modern data center is that IT professionals are stretched too thin, and that problems of the day are more pressing than investing the time in designing an architecture suitable for the future. The shortage of resources and time is why organizations consider all-flash arrays, which are typically bought to solve a particular performance problem. Scale-up all-flash systems appear to be the simple, quick fix because they can start small and add capacity via shelves.

In many cases, the scale-up all-flash system does solve that problem and the IT professionals that manage it want to leverage it for more of their data center storage. As the use case expands, the limitations of the scale-up system become evident and the IT planner may wish he or she had considered a scale-out system, which may be able to address both triage problems and strategic planning.

Scale Up

In their initial configuration, all-flash scale-up architectures deliver as much or more performance than an initial configuration of many scale-out all-flash arrays. But unique to the all-flash scale-out architecture is the ability to triage the initial pain point while supporting a shift toward an all-flash based IT infrastructure. Nodes can be incrementally added to allow easy addition of workloads to leverage the investment in a single system. The ability to gradually add performance and capacity by additional nodes means that the scale-out architecture can also become strategic. In other words, IT planners can look strategic while acting tactically.

The key to a successful scale-out architecture is making sure that the performance from additional nodes can be intelligently provisioned by quality of service (QoS) capabilities. If workloads can't be protected from each other in terms of performance, then application owners won't support consolidation.

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Another benefit of an all-flash scale-out architecture is that capacity is added with each new node, which can be almost limitless depending on the architecture. Scale-up architectures increase capacity by adding a fixed number of drive shelves. In some cases, the effective size, thanks to deduplication and compression, is adequate to meet current application needs.

As business needs evolve and more workloads are added more capacity is required, ultimately reaching the scale-up architecture's real constraints: storage processors and network connections. Each time a shelf is added to a scale-up architecture, its performance and network bandwidth become more diluted and can only be fixed through controller upgrades.

Addressing compute and network limitations is where the scale-out solution has an advantage; each additional node adds more processing power and network connectivity. The addition of multiple workloads running in parallel is a very effective way to use the scale-out architecture.

Furthermore, some all-flash scale-out architectures have the ability to mix node types in terms of storage processing and capacity of the internal SSDs. The mixing of node sizes brings the solution full circle. The IT planner can start by using one node type to address an initial performance problem and then add another node type to address the entire data center's long-term needs in terms of both capacity and performance.

Conclusion

IT professionals face storage performance triage problems daily. They need to solve the problem now so that application owners and users will be satisfied. Being in constant triage mode makes it difficult to think strategically. Fortunately, all-flash scale-out architectures are well suited to meet the initial performance problem while positioning the organization to be strategic when the triage is completed.