A flash of inspiration**A flash of inspiration**

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Quocirca Comment

Shaking the storage tree

Remember all of the hullabaloo around different types of magnetic disk-based storage? How it was necessary to have hugely different types of arrays to manage the different storage workloads that were required to store an organisation's data?

The need for such highly targeted arrays were more to do with trying to deal with the issues of the underlying disk-based architecture than anything else. This is just one of the many areas where flash-based systems present massive additional value over their magnetic-based ancestors.

In the first instance, the massive improvement in basic storage performance means that there is less of a requirement for bringing together completely different arrays to support mixed workloads. This also makes managing the need for scale-out and scale-up as workloads increase far easier to carry out.

However, there will often be a need for highly targeted capabilities when dealing with a specific workload – but this will tend to extend beyond just the need for a specialised storage environment. Here, the mix between what is required at the server, storage and network levels has to be considered.

Problems with disk-based SAN and NAS

Historically, storage area networks (SAN) tried to address this issue. By creating a dedicated network, data traffic could be speed optimised. Storage arrays in the SAN were loaded with processor chips to make data transfer to the disk as fast as possible, along with memory for caching where the disk could not keep up. The problem still lay with the disks – and also that the cost to implement a SAN was generally well outside of any single project's reach, although at an organisational strategic level, SAN would be cost effective for consolidated multiple storage workloads.

Network attached storage (NAS) was a different approach – using the main LAN as the network, discrete storage boxes could be created where processors and disks were closely aligned to provide as much speed as possible – but it still suffered from spinning disk and LAN issues. Also, trying to use NAS as a single resource pool has not proved easy – although it can be done, performance has tended to be poor across a mixed estate of NAS boxes, so NAS virtualisation has not been recommended for prime storage workloads.

Flash and converged systems

The incoming flash storage vendors also saw the need for an approach that would optimise overall performance. However, as these companies did not have as much existing technology and had less dependence on the performance of the storage substrate (flash was so fast compared to spinning disk that storage performance itself was no longer a major issue), they decided to (or, in many cases had to) design their systems from the ground up.

This enabled their systems to be highly innovative, with each aspect of the system designed specifically to work with each other aspect. These systems have become known as 'converged storage systems' – and Quocirca is seeing considerable interest from buyers in this space.

The three strengths of converged flash

Firstly, 'time to capability' is massively compressed. A converged storage system already has the compute, storage and network hardware

provisioned, alongside specialised systems administration firmware and software that ensures that storage workloads are fully managed. For example, Violin Memory's Flash Storage Platform provides a high-performance integrated environment based on Violin's Flash Fabric Architecture (FFA) to provide a highly tuned primary storage solution.

Secondly, operational costs are kept low. Hand-built solutions have weak links along the whole chain, and identifying the root cause of any problem can take up a lot of time and involve multiple different skill sets.

With a converged storage system, the management software understands how everything works together – it not only provides root cause analysis of data to enable rapid remediation, but it can also enable higher levels of availability and business continuity through automated failover internally via N+M redundancy, or externally to mirrored systems. In most cases, the storage management software can now be included as a peer within the overall IT systems management environment, allowing single pane of glass management and enhanced total root cause error identification and remediation.

Third is scale-out or scale-up capabilities. Often, when adding new resources to an existing SAN or discrete storage array, issues can be faced where input/output (I/O) speeds start to fall away. Converged storage systems tend to offer the capability to add incremental storage resources as needed, with close to linear performance capabilities.

For scale-out, this allows for multiple storage workloads to be hosted on the same storage platform, while still enabling optimised performance per workload. For scale-up, it allows for hyper-optimised performance for highly specific workloads on a system.

All systems are not born equal

This move toward storage convergence, though, does not mean that all systems end up equal. Indeed, alongside the need for excellent hardware comes the need for equally excellent software and firmware all engineered to work together seamlessly.

And this is where many vendors are getting it wrong. Converged storage systems with any type of spinning disk (all spinning or hybrid spinning plus a tier of flash) in them are just non-starters. The inherent problems with magnetic disk will become the gating point on the performance of the overall system. Likewise, those who have chosen to go down a flash-based disk approach may be able to demonstrate good performance now – but will find that they have gone down an evolutionary cul-de-sac as time goes on.

A hybrid flash layer/spinning disk approach can end up as the worst of both worlds. The idea is that 'hot' data (that which is accessed the most) is placed on the flash media, with less hot data being placed on the spinning disk and made available as and when required.

Consider the following case, though – the calling application requires a certain item of data. The storage array goes and checks whether it is in flash, and finds that it isn't. It then has to go down to spinning disk and retrieve it. A call that on a pure spinning disk array would have been slow has suddenly become slower still – not only is there the time to retrieve from magnetic disk to be considered, but we have now added on the time for the abortive retrieval of data from the flash environment.

Disk is dead

The concept of a disk should be seen as an evolutionary dead end. The whole concept of a disk is based on maintaining the status quo: calls to the underlying storage medium are still based on

expecting to find something that looks and responds as if it is a spinning disk.

To escape this constraint, it is necessary to look to a different means of putting the flash to work. By replacing the disk concept completely, a more open and flexible architecture for future convergence can be created that leaves options open for new ways of dealing with the way that data is stored and retrieved.

Architecting from the ground up also allows for different interconnects to be used, and for virtualisation to be optimised across the resulting platform. It also enables different workloads to be managed on the same device: by abstracting the underlying resources from the workload, a software-defined approach can ensure that the mix of resources applied to a specific workload can be optimally provided – and changed as required.

Therefore, Quocirca sees new systems coming through that leave behind much of the old-style storage thinking. These arrays are not predicated on the concept of a disk; are not stuck with trying to enforce block, file and object storage paradigms; are not constrained by having to keep to approaches that are over half a century old.

Storage convergence based on flash media offers a different way for organisations to implement a fast, high availability data platform. It provides better data management; better expansion capabilities; more future options; and a better means of bringing storage fully into the IT platform when it comes to overall systems management.

About Violin Memory

Violin Memory transforms the speed of business with continuous data protection through high performance, always available, low cost management of critical business information and applications.

Violin's All-Flash optimized solutions accelerate breakthrough CAPEX and OPEX savings for building the next generation data centre. Violin's Flash Fabric Architecture (FFA) speeds data delivery with chip-to-chassis performance optimization that achieves lower consistent latency and cost per transaction for Cloud, Enterprise and Virtualized mission-critical applications. Violin's All-Flash Arrays empowered by our enterprise data management software solutions enhance agility and mobility while revolutionizing data centre economics.

Founded in 2005, Violin Memory is headquartered in Santa Clara, California.

Further details are available at http://www.violin-memory.com

About Quocirca

Quocirca is a primary research and analysis company specialising in the business impact of information technology and communications (ITC). With world-wide, native language reach, Quocirca provides in-depth insights into the views of buyers and influencers in large, mid-sized and small organisations. Its analyst team is made up of real-world practitioners with first-hand experience of ITC delivery who continuously research and track the industry and its real usage in the markets.

Through researching perceptions, Quocirca uncovers the real hurdles to technology adoption – the personal and political aspects of an organisation's environment and the pressures of the need for demonstrable business value in any implementation. This capability to uncover and report back on the end-user perceptions in the market enables Quocirca to advise on the realities of technology adoption, not the promises.

Quocirca research is always pragmatic, business orientated and conducted in the context of the bigger picture. ITC has the ability to transform businesses and the processes that drive them, but often fails to do so. Quocirca's mission is to help organisations improve their success rate in process enablement through better levels of understanding and the adoption of the correct technologies at the correct time.

Quocirca has a pro-active primary research programme, regularly surveying users, purchasers and resellers of ITC products and services on emerging, evolving and maturing technologies. Over time, Quocirca has built a picture of long term investment trends, providing invaluable information for the whole of the ITC community.

Quocirca works with global and local providers of ITC products and services to help them deliver on the promise that ITC holds for business. Quocirca's clients include Oracle, IBM, CA, O2, T-Mobile, HP, Xerox, Ricoh and Symantec, along with other large and medium sized vendors, service providers and more specialist firms.

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