



Inside Track
Executive Brief



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AND



It is time to reconsider Server Based Storage

What you thought you knew
about storage has changed

Introduction

Data is important to almost everything a company does, and many would say that it is essential, so where and how you store that data is equally important. For at least 20 years, the de facto standard for many data use cases has been networked storage. However, people are beginning to talk again about Server Based Storage, or SBS, as being viable in certain situations. Why is this?

A major reason is, quite simply, that SBS solutions today are not the same as they were 20 years ago because storage, like many other areas of IT, has greatly evolved. In particular, modern SBS is no longer simply direct-attached storage hardware – it also has a software element, allowing it to be accessed and used much more flexibly.

In this paper, we will explore how storage in general and SBS, in particular, have changed, and why now may be the time to reconsider SBS alongside other storage solutions.

A brief history of storage

In the early days of commercial computing, the storage attached to a system could only be accessed by an application running on that system. That changed as data networking became widespread in the 1980s - storage could now be accessed remotely, and with the advent of NFS (network file system) software, it could even be published as a shared resource.

However, those networks and servers were relatively slow, so it was cumbersome to either access the data remotely or move the data to another system for use there. Most storage, therefore, remained confined within its host server, which led to considerable amounts of expensive storage capacity going unused – as much as 70% in some studies.

This opened the door for block-based SAN (storage area network) and file-based NAS (network attached storage) systems. They made it easier and more cost-effective for multiple servers to access the same storage simultaneously, although it also made the network cards in the servers and storage systems into potential bottlenecks.

Today, networked storage still has its place, but it is no longer the only way to improve storage utilization or to enable multiple servers and their applications to share data. The combination of modern Software Defined Storage (SDS) solutions with more powerful servers and networks means that SBS once again has the potential to become a significant component of enterprise IT infrastructure. A major part of that is the ability of SDS to pool the storage held across multiple servers and make it available to any application running in the network.

Why start/restart with SBS?

There are several good reasons to take a fresh look at SBS. Perhaps the most compelling of these is that traditional storage systems can be complex and require a set of specific skills to implement them and keep them working securely and effectively.

Complexity

Using storage that is based within the server can significantly reduce the complexity of the IT infrastructure and, more importantly, its operational management. After all, any IT team is likely to have x86 server skills and experience, and if you can manage a server, you can manage the storage contained within a server. However, IT teams are less likely, especially in smaller organizations, to have skills specific to the management of networked storage platforms.

It can also reduce complexity in other ways. One is avoiding the need to have a support and maintenance contract with the supplier of the storage platform, in addition to one for the servers. Similarly, the requirement to find space and potentially power for the storage platform can be removed.

Cost

If high availability is an issue – and when isn't it today – then it is likely that you will need multiple networked storage devices. This can be costly if it means you have to buy extra NAS or SAN systems. But if you simply have three or more servers providing storage, you can add resilience by adding additional storage into those servers. So the only additional cost will be for the extra storage devices, hard disks (HDS) or solid state disks (SSDs), without any need to buy additional physical boxes just for resilience and redundancy.

Flexibility

With modern software, it is possible to build storage systems using standard servers that can grow as capacity demands increase. Indeed, SBS capacity can grow in two dimensions. The first dimension is scaling up within the server by installing additional storage, assuming there are free storage bays. The second dimension comes via scaling out, by adding more servers to the SBS pool.

A further flexibility factor comes from the fact that modern SBS software allows the storage devices used to vary both in physical capacity and type. So a single SBS pool can include different sized hard disks, solid state disks and NVMe flash drives, for example.

When might SBS not make sense?

As with any technology, SBS will not fit every single use case. This may be true if there is a demand for access to very large volumes of data where data synchronization and coherency is a key requirement or if consistency of storage latency is a requirement.

Another factor that might count against an SBS solution is if the network already has very high utilization rates. The additional data and metadata traffic between different servers in the pool could lead to latency inconsistencies and reduced performance.

A final factor to bear in mind is if you plan to build an SBS system using existing servers. Old systems with low CPU speeds and memory limitations may struggle to perform adequately with the SBS software.

Modern SBS solutions and suppliers

A big challenge with modern SBS solutions is the varying language used in marketing such systems. It is a crowded marketplace, where storage vendors use differing terminology to make themselves heard in the noise and position themselves in the market.

Many of the available SBS options are based on hyper-converged infrastructure (HCI) platforms, including VMware, Microsoft, Nutanix and open-source offerings. Other solutions now coming onto the market may be built using software that aggregates the storage within servers. The challenge is to find a vendor that has the type you want with the flexibility you need.

When looking for appropriate solutions and suppliers, some core requirements are easy to identify.

SDS software choice

If you have a preferred SDS solution in mind, then the question is simply whether the vendors you are talking to offer this solution. If you have no preference, then the question becomes “Do the vendors you are talking to offer a range of solutions so that they can work with you to identify the best approach to take?” After all, you want the best solution for your needs, not the one that best suits the vendor.

Server components and storage flexibility

A more subtle, but equally important question, is whether the vendors you are talking with offer server systems that are easy to acquire, simple to get working, and straightforward to run operationally once the SDS system is live. But this is the easy part, the second part of the question is “Do they offer servers with a range of storage component choices that meet your needs?”

This looks simple, but can be deceptive. Some vendors may only supply servers from a catalog that offers fixed CPU, memory, storage and networking configurations. They may also offer only a small range of hard disk and flash storage options to upgrade the storage elements. This approach may suit some of your needs but not all of them. It may be better to find a vendor that offers greater configuration flexibility, both at initial acquisition and during the likely extended lifetime of the servers in your SBS pool.

This flexibility could include offering:

- Both SAS and SATA hard disk drives in a range of capacities and rotation speeds
- PCIe based flash storage drives in a range of capacities
- NVMe based flash storage drives in a range of capacities
- Non-Volatile Memory (NVM) storage options
- Additional memory in a range of options
- Additional network cards in a range of options

Of course, these components need to be high quality, to ensure that anything you add or change can be trusted to meet your service delivery commitments. Check too that the provider will add the additional components to your existing maintenance and support contract without any financial penalty.

Also very useful is if the supplier offers a modeling tool that allows you to check the impact that modifying storage or adding additional storage capacity, memory or CPU components etc. has to your server fleet. Even in 2020, hardware, software and firmware compatibility conflicts have not disappeared. Such system configuration modeling capabilities are important if you need to configure systems to meet your requirements, rather than relying on standardized, preconfigured offerings.

Other supplier factors

Additional considerations when selecting your solution and supplier could include:

- Do the systems come with good management tools to indicate when upgrades or changes may be required before system downtime occurs?
- Can the systems be easily upgraded as your storage requirements change without service interruption?
- Can you get local support wherever you have systems?
 - Rapid 24x7, local-language help when needed.
 - Speedy access to any components that need to be replaced.
- Will the server supplier support the SDS software solution (or solutions) you need, or will you need a second support contract with the software vendor?
- Does the supplier understand your specific needs, not just those of a general customer?
- Do they have a partner community that includes those suppliers with whom you already work?

Summary

Storage software has evolved rapidly in recent years and the development of sophisticated SDS offerings, allied with modern server-hosted storage, has made server based storage an attractive option for many general-purpose use cases. Sure, some monolithic apps may still need SAN arrays or NAS filers, and NAS is still efficient for large user groups. But SBS is once again a potentially attractive option if you have the right flexibility of storage and other components available from your supplier of choice.

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