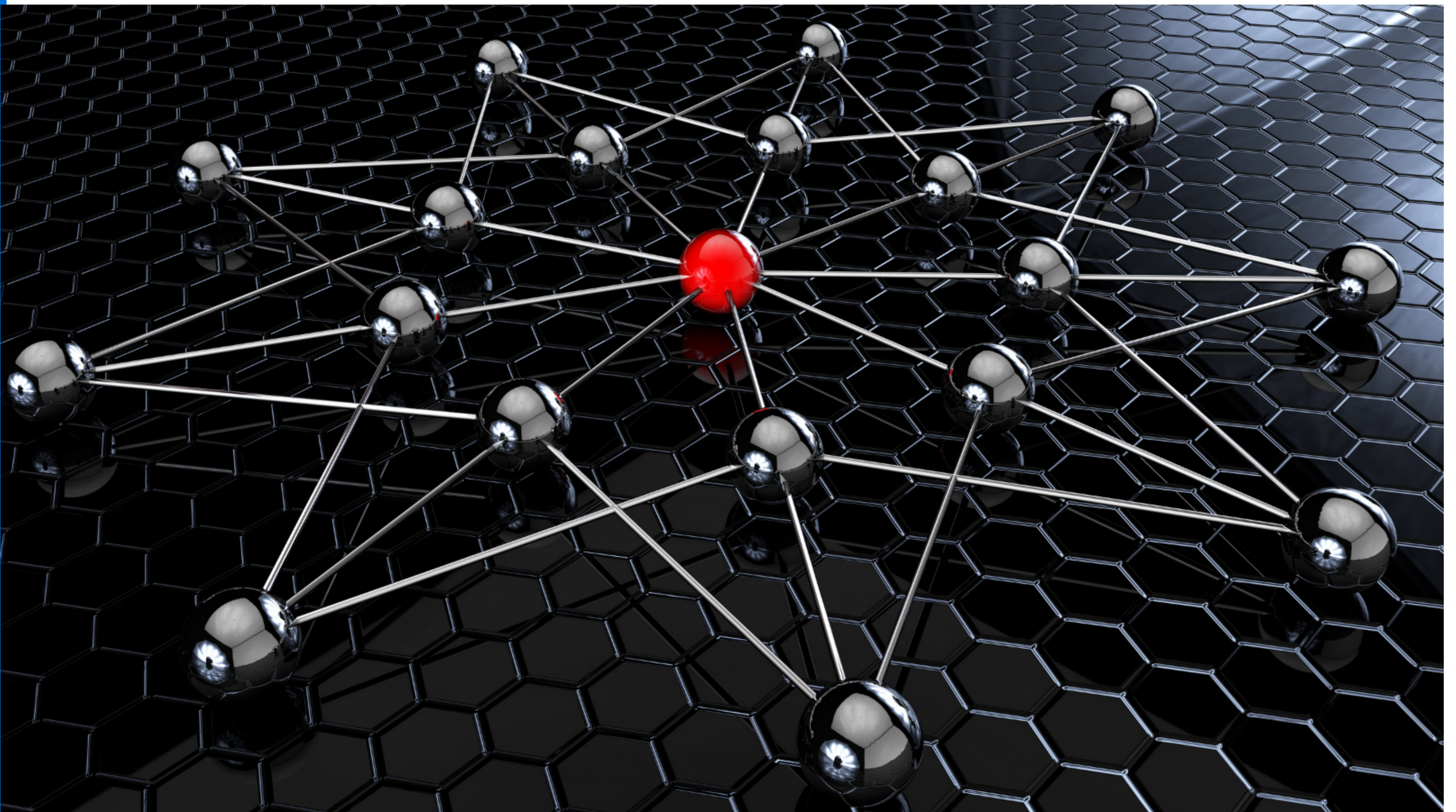


# THE FUTURE OF SHARED STORAGE IS NAS

**BEN PEARCE**

CHIEF BUSINESS OFFICER (ASIA) & CO-FOUNDER GB LABS



**With greater performance, functionality and ease of use, it is hard to justify the need for a SAN in modern creative workflows.**

As technology moves forward and IP connectivity continues to revolutionize workflows in the media industry, we are starting to see SAN (Storage Area Network) as an inconvenient and overly complicated way of sharing our digital storage amongst the various platforms that most businesses use.

In this paper we will look at the differences between the two technologies and highlight the major advantages that NAS (Network Attached Storage) offers to modern businesses.

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## Technology

A SAN architecture is required when providing 'block level' shared access to hard drive storage for multiple workstations. The access and management of the storage comes from the MDC (Meta Data Controller) and this introduces a big limitation to how many users can simultaneously access a particular share point.



This number is generally no more than 20 machines, and this problem is known as meta data contention.

Whilst MDCs can failover to another backup MDC, there can be only one active MDC and its workload cannot be load balanced across multiple machines... so additional MDCs are literally redundant until required.

SANs tend to suit particular operating systems meaning that it is rare to have PC, Mac and Linux machines working together. Also the fact that software needs to be installed prevents certain workstations or servers being connected at all and limits the compatibility with the many generations of operating systems used.

Most SANs are Fibre Channel based, therefore cards need to be installed into workstations and specific cables, switches and transceivers are needed. In addition to this the management of the SAN is done through standard Ethernet networks.



A NAS (Network Attached Storage) is a storage server that can offer it's own connected storage as 'file level' shares to a network of Ethernet connected clients using various different sharing protocols for maximum compatibility and flexibility. No software needs to be installed and no hardware such as a Fibre Channel card needs to be installed either. NAS works with standard Ethernet networks which keeps costs low and flexibility high.



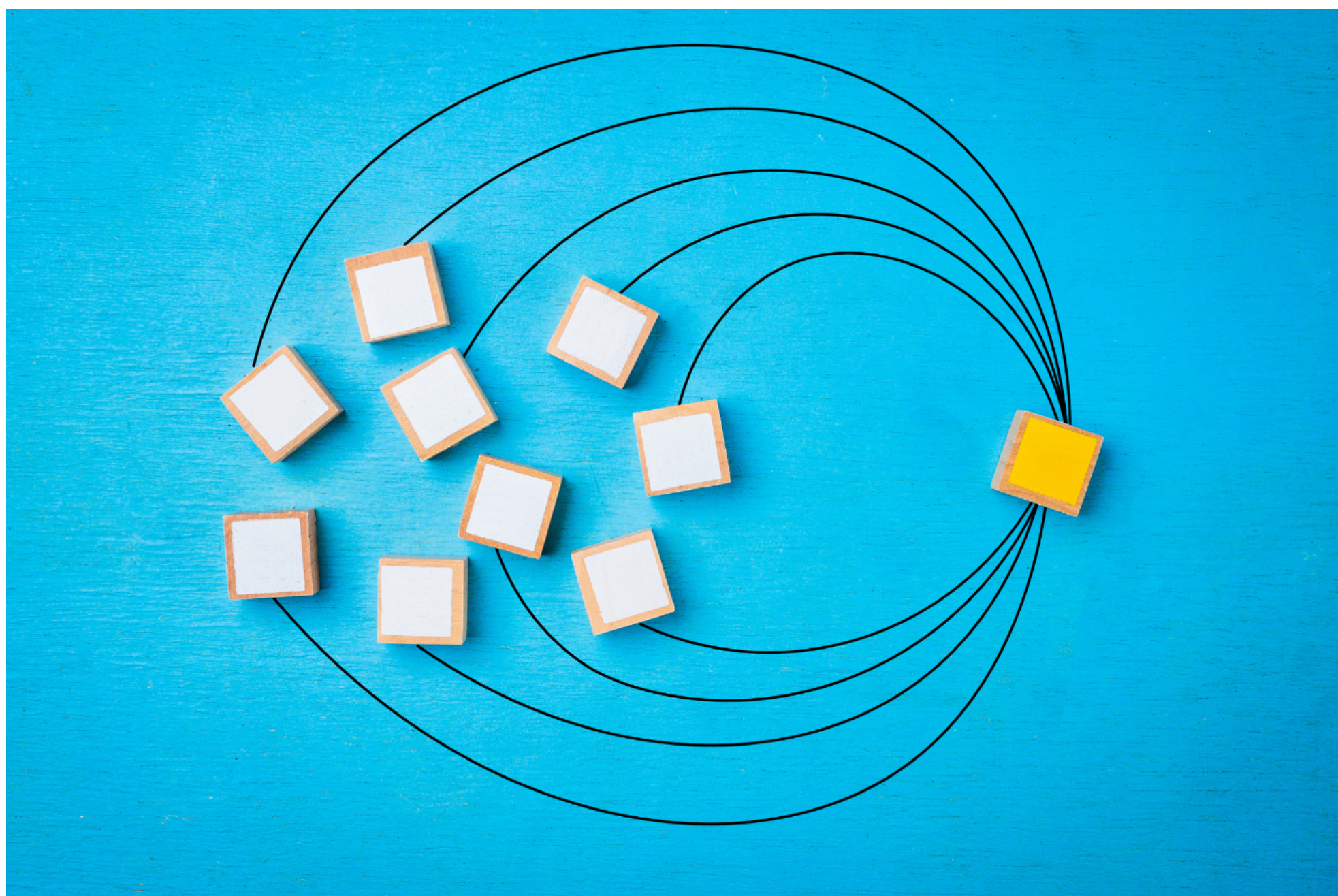
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NAS can potentially connect to anything and encourages collaboration between all the platforms within an organization. Unlike SAN, NAS does not suffer meta data contention and therefore allows many more users on a share point and much greater scalability in terms of users and performance.

The functionality of a NAS is far greater than a SAN; Analytics, bandwidth control, quotas, cloud integration, AD synchronization, profiles and monitoring are just some of the additional features a NAS can bring. As mentioned before the NAS is a storage server and can therefore run many beneficial applications and workflow tools that are just not possible with a SAN MDC.

## Scalability



More users mean more switch ports and more cost, but the really big problem is the uplinks between switches. The uplinks in Fibre Channel switches create bottlenecks that cannot be ignored. Every switch port should be able to deliver full bandwidth, but if the uplink from another switch is a fraction of the total port bandwidth, then the performance per port becomes truly sub optimal.

Ethernet switches are easier to deploy with faster uplinks and ultrafast backplanes available within blade switches. Multiple networks can easily be attached to the NAS allowing good network design to eliminate bottle necks.

Some NAS platforms support dynamic scaling of capacity meaning almost no down time. Whereas adding storage to a SAN, especially resizing existing volumes is usually a data off, expand and then copy back procedure, wasting days of downtime.



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## Cost

Licenses are a big part of the cost and inflexibility of SAN ownership. Each user, including the MDC and any failover MDCs must be licensed as either a one off cost or annual ongoing expenditure. Specific additional hardware is also required, such as Fibre Channel switches and cards.

NAS does not require software licenses and most likely requires no additional hardware or software installation. Almost all computers come standard with at least one 1Gb Ethernet port and standard network hardware is cheap and easy to source. For higher bandwidth usage 10Gb, 40Gb or 100Gb Ethernet can be added to a client machine in the form of a PCI card or Thunderbolt/USB C interface to dramatically improve performance.

## Connectivity

Looking at the speed of connections available today, it is easy to see how NAS is surpassing SAN;

NAS options - 100Gb, 40Gb, 10Gb and 1Gb Ethernet.

SAN options - 32Gb , 16Gb, 8Gb and 4Gb Fibre Channel

Copper or optical cables can be used with SAN or NAS and very large distances can be achieved with optical cable and advanced transceivers.

As seen in the example above, Ethernet connectivity has surpassed Fibre Channel many years ago and additionally server end connections can be channel bonded to produce very fast interfaces to serve large numbers of clients and provide cable redundancy. Load balancing connections in a SAN is far less flexible and not truly compatible across platforms, such as Mac OS.





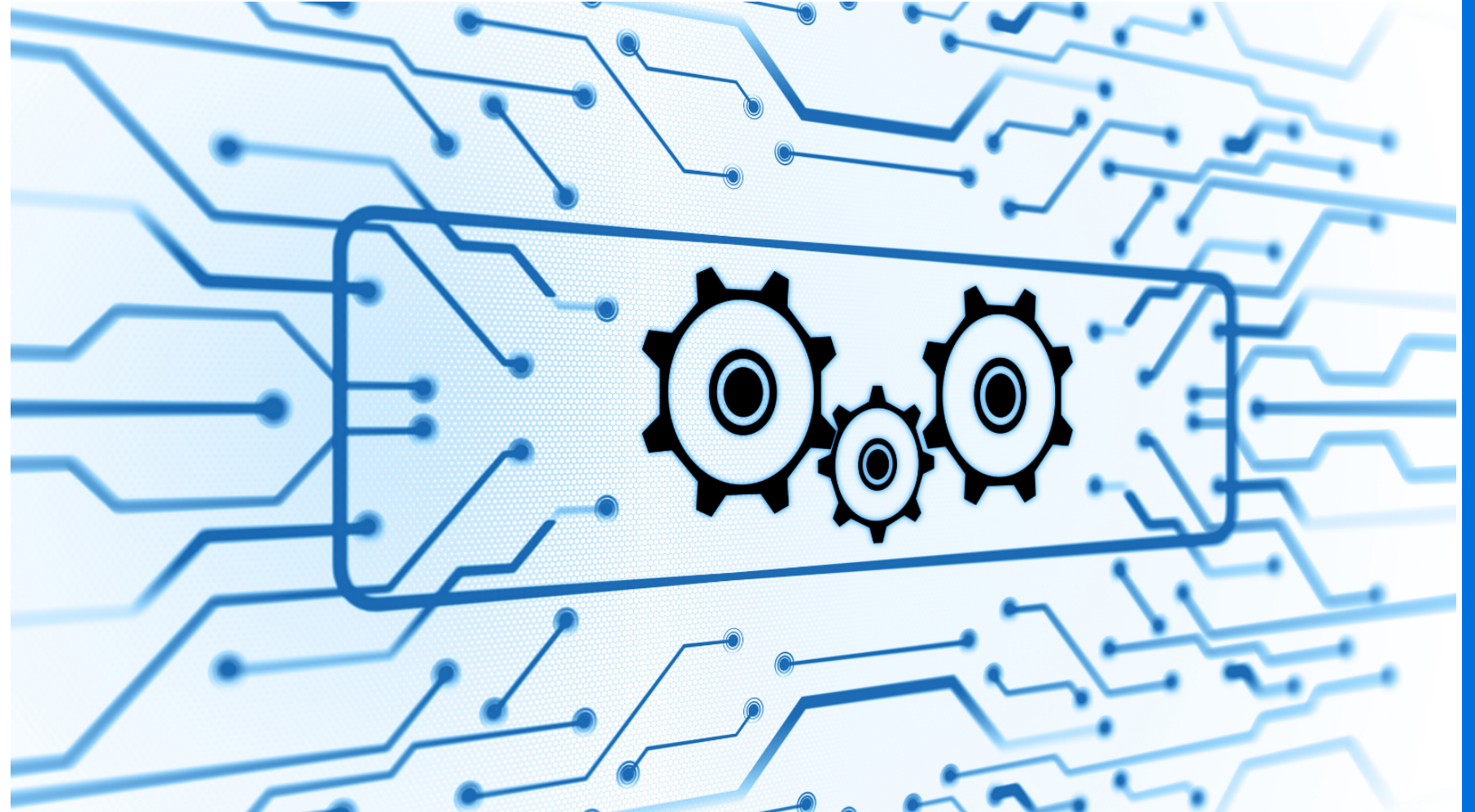
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## Support

SAN is comparatively complicated and involves many more elements, which in turn bring about many more possible points of failure. Operating systems need to be matched and software needs to remain compatible after updates or data is simply not

available, as the storage cannot be mounted. Deployments are very involved and installation time, training and on going support is considerable.



## Summary

If you are looking for large capacity, scalable shared storage that will connect to everything in your facility then you have a clear choice.

The biggest issue is that most NAS systems are not built for demanding usage and large scalability, so the choice of NAS is restricted to manufacturers that actually understand high bandwidth usage and also provide genuine sustained performance for mission critical usage.

By comparison a SAN is very restrictive, complicated and expensive and only really achieves the simple function of sharing storage.

‘Block level’ access can be beneficial for certain uses, but the reduced latency and improved efficiency found in modern high performance NAS storage systems means that this marginal benefit has lessened over time.

**UK/EMEA (HQ)**  
GB Labs Ltd  
Units 1-2 Orpheus House  
Calleva Park  
Aldermaston  
Berkshire, RG7 8TA  
Tel: +44 (0)118 455 5000  
Email: [info@gblabs.com](mailto:info@gblabs.com)

**USA**  
GB Labs Corp  
23515 Summerglenn Place  
Valencia, CA, 91354  
USA  
Tel: 1 661-493-8480  
Email: [info@gblabs.com](mailto:info@gblabs.com)