



Creativity Can't Take Place in Silos

Introduction

Media & Entertainment production houses have a high-priority job to do - feeding the creative process, VFX artists, render farms, grading and finishing without delaying any of the process through administration.

These facilities will have many creative disciplines, many different types of software and often a lot of technology and storage islands to service them all. Storage islands, such as a full Storage Area Network (SAN) or SAN-in-a-can applications, can result in huge amounts of duplication and time spent data wrangling. This problem is compounded as there will be a constant pressure to stop these buckets of storage from overflowing as these facilities work on multiple shots, scenes and projects concurrently.

This whitepaper will explore the current status-quo for production houses, the 'why' behind the industry trust in SANs, and how moving to technologies, such as NAS, can liberate data and media workflows.

“provide a shared storage environment that guaranteed video content could be played back without disruption”

Why did SAN fit?

Whether for content capture, post-production editing, visual effects, or coloring and finishing, Fiber Channel and Storage Area Networks met the needs of the modern media production environment for one key reason; they provided a shared storage environment that guaranteed video content could be played back without disruption.

But this capability comes at a cost, both in monetary terms, and the fact that a SAN is an 'island' of data and limiting collaboration, productivity and efficiency.

How does SAN do it?

At its simplest, a Storage Area Network or SAN is a storage solution that provides deterministic connectivity between Hosts (servers and workstations) and Storage (disk or RAID devices), via a Fabric. Each workstation, or host, within the fabric could address shared storage as if it were a local drive directly connected to the Operating system.

Because of its low latency and high bandwidth, it provided some degree of reassurance that the shared storage would not be a limiting factor in achieving video playback. However, the cost of SAN is often prohibitively high, requiring budgets

and engineers to be dedicated to specific parts of the workflow. At a technical level, SAN requires additional ethernet networks to manage file locking, space allocation and data access and larger SAN fabrics can lead to unpredictable performance.

The overall infrastructure architecture and business direction may need to make compromises imposed by having to share data between services via a SAN, which may not be realised until after large investments have already been made. The overall cost and complexity is very high.

Where commodity IT fell down

Thanks to advances in the performance of commodity IT hardware and Ethernet networks there was the potential to meet the performance requirements for Media & Entertainment with reduced complexity and vastly improved value for money per port or per client.

However, Scale-Out NAS Appliances and Software-Defined Data Platforms are not capable of servicing true 4K frame-based playback requirements. Even with the most careful tuning and the use of local SSD or NVMe cache on their nodes, they just cannot guarantee performance to real-time applications.

This is because the low level data-flows between NAS and SAN are dramatically different. The host Operating System must address a network storage target as opposed to a direct attached volume. This affects the application performance, and adds additional CPU overhead on both host and server side.

pixstor

pixstor from pixitmedia is a holistic software-defined storage solution that is specifically designed for Media & Entertainment.

Utilising commodity IT and Ethernet technology, pixstor takes a top down, application-first approach to offer the flexibility of a shared NAS environment with the option of utilising technologies, such as NVMe-oF. NVMe-oF is desirable as it can provide performance and latency that exceeds that of a SAN and gives that 'SAN-like' experience.

At all times the pixstor solution respects the golden rule in Media & Entertainment; guarantee bandwidth to real-time video playback applications.

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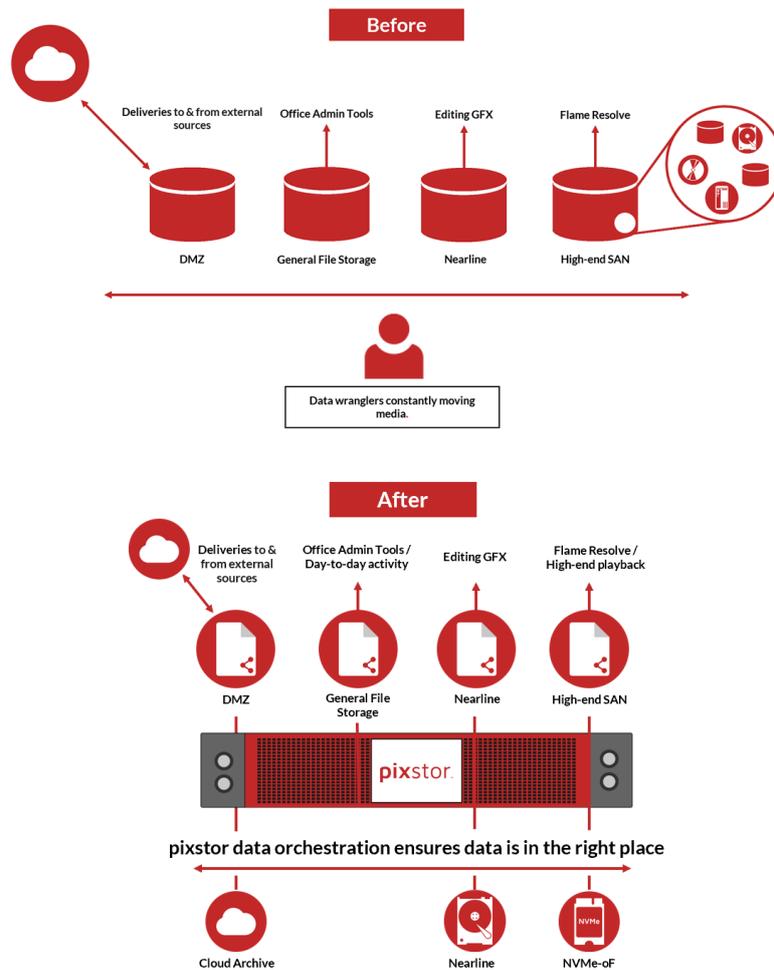
“respect the golden rule in Media & Entertainment; guarantee bandwidth to real-time video playback applications”

High End Production

Post production, VFX, Grading and Mastering facilities often do require high-end playback of frame-based media, and they have historically relied on a SAN to deliver the required performance. But the nature of collaboration and multi-disciplinary working means that not all users and processes require this performance.

So production facilities have tended to become a collection of technology islands; some DMZ storage for incoming and outgoing deliveries, nearline and archive storage for the bulk of files, and either a SAN or local frame-stores (aka, an SSD RAID within the workstation itself) to meet high-end playback requirements. The net result is huge amounts of data duplication and time spent wrangling data throughout the workflow or pipeline.

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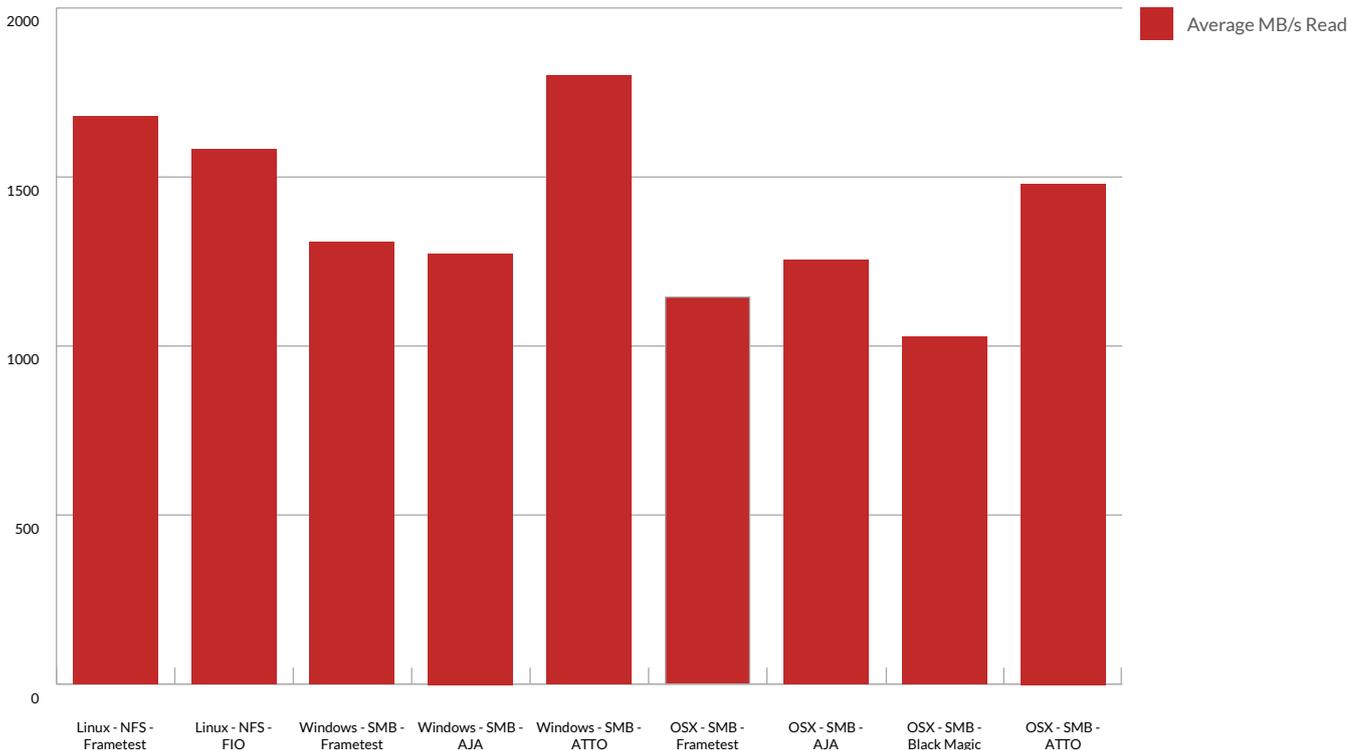
Technology teams within these responsible for such facilities have to become generalists, capable of managing and maintaining many tools and systems. This is no mean feat given the proprietary nature of many of these isolated solutions. So they will rely heavily on benchmark tools, but these were generally designed for SAN systems.

Benchmarking the Benchmarks

We have demonstrated in our pixitmedia lab that test application results, used to assess the suitability of shared storage, vary hugely. And when Frametest, the go to SAN benchmark application, is compared to real-world performance of Blackmagic Resolve, there is also a remarkable variance in results.

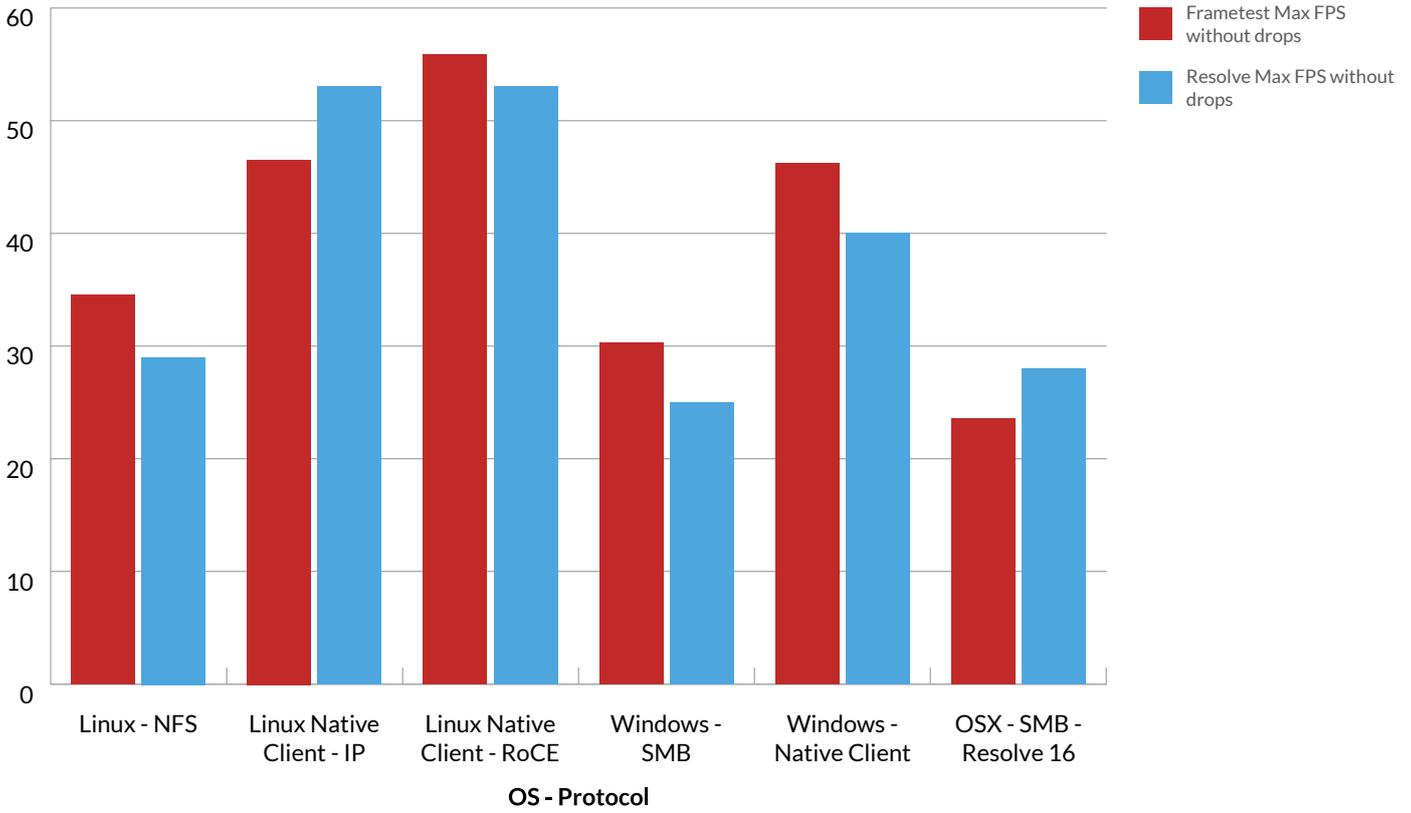
“time is spent wrangling duplicated data throughout the workflow or pipeline”

NAS Protocol Results

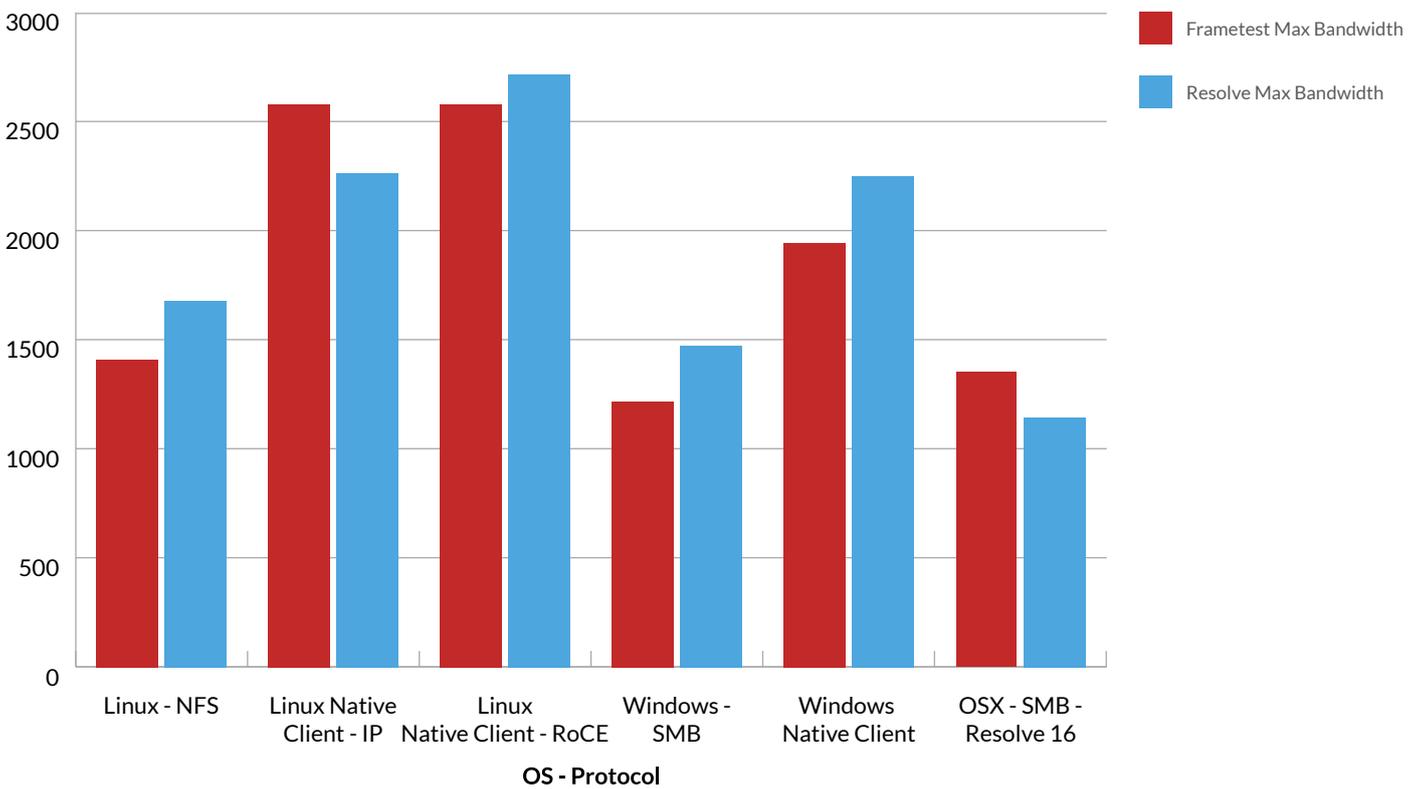


OS - Protocol - Benchmark	Application Type	Average MB/s Read
Linux - NFS - Frametest	Tunable	1,679
Linux - NFS - FIO	Tunable	1,582
Windows - SMB - Frametest	Simplified	1,307
Windows - SMB - AJA	Simplified	1,273
Windows - SMB - ATTO	Tunable	1,800
OSX - SMB - Frametest	Simplified	1,146
OSX - SMB - AJA	Simplified	1,255
OSX - SMB - Black Magic	Simplified	1,027
OSX - SMB - ATTO	Tunable	1,479

Frametest vs Resolve (FPS)



Frametest vs Resolve (Bandwidth)



Frametest vs Resolve				
OS - Protocol	Frametest Max FPS without drops	Resolve Max FPS without drops	Frametest Max Bandwidth	Resolve Max Bandwidth
Linux - NFS	34.5	29	1,410	1,679
Linux Native Client - IP	46.51	53	2,577	2,264
Linux Native Client - RoCE	55.82	53	2,577	2,717
Windows - SMB	30.28	25	1,216	1,474
Windows - Native Client	46.2	40	1,945	2,249
OSX - SMB - Resolve 16	23.54	28	1,361	1,146

As you can see from the above results, our pixstor solution with ATTO technology is easily capable of providing the performance you need with your application.

** Windows and Linux tests were performed using the same HP Z8 workstation, 2x Intel Xeon E5-2637 CPU @ 3.5GHz (HT Enabled, 24 cores/48 logical) with 32GB Memory. The Mac tests were performed using a Retina 5K iMac, with 3.2GHz Intel i5 CPU and 24GB Memory. The mac network interface was a 25Gb ATTO Thunderlink via thunderbolt connectivity. The pixstor solution utilised SSD drives configured as part of a global namespace.*

Summary

High end facilities will of course need high performance shared storage solutions. But they must also respect all other users, disciplines and processes to leverage the efficiency that is gained by operating facility-wide shared storage.

The many moving parts within the modern production environment means we can no longer be lulled into the false sense of security that SAN technology used to provide. When assessing application performance and ultimately end-user experience, the best benchmark is a real-world, workflow relevant benchmark.

It is with the pixstor solution, combined with ATTO technology, and our top down approach that we achieve the most effective way to ensure that the solution will be fit for purpose and we can focus on the job in hand; creativity and excellence.

“the pixstor and ATTO 360 solution is 100% cloud compatible”

“focus on the job in hand; creativity and excellence”

About pixitmedia.

pixitmedia delivers seamless collaboration to enable the power of ideas.

Our purpose-built, software-defined storage and data solutions simplify the flow of data to connect an increasingly complex world.

Our aim is to deliver beyond expectations throughout all areas of our operation. We devise solutions that give customers both choice and freedom, our restless innovation constantly pushes boundaries and the unrivalled care and knowledge of our team ensure optimum performance and value. Customer success is at the heart of our business.

We have a dedicated in-house lab facility to guarantee the effectiveness of our solutions.

pixitmedia is privately-owned and headquartered in the UK, with offices in the USA and Germany.

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