

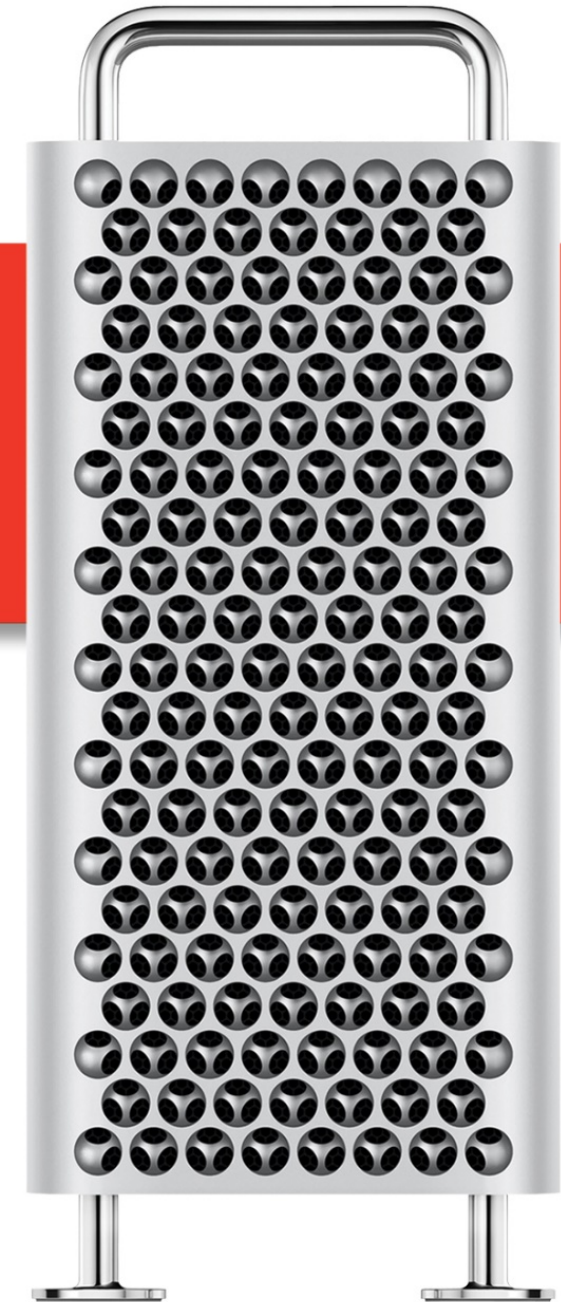
# ALWAYS GREAT TOGETHER



The Power Behind the Storage



## ATTO & Mac Pro<sup>®</sup> The Perfect Pair



# ATTO and Apple – a perfect pair!

ATTO and Apple® have been a perfect pair for media professionals since the early 1990s, working together to drive the digital media revolution. The combination of distinct technologies, support of media workflows and industry experience continues to drive innovation in digital media workflows today.

Just like the Apple Mac Pro®, ATTO network and storage connectivity products are purpose-made to support all phases of media production, from ingest to final archiving. Our ecosystem of high-performance connectivity adapters, network interface cards and software fully supports macOS® Catalina and the 2019 Mac Pro.

View our [Apple Solutions](#) in this guide as we identify common industry pain points and provide solutions to improve your workflow.

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# The absolute best shared storage area network experience for the Mac Pro

Recommended product: ATTO Celerity™ Fibre Channel HBAs

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## Background

The media and entertainment industry continues to undergo a digital transformation. At the beginning of this process production infrastructures transitioned from analog to digital, including the storage and archiving of countless new digital assets.

Filmmakers, especially, required state-of-the-art storage networks, fast and robust enough to handle the flow of data from workstations to storage. Reliability in data delivery and uptime were paramount. Fortunately, Fibre Channel technology had emerged just ahead of this transformation, and it fulfilled the needs of studios handling this new paradigm.

Fast forward to now, where the transformation continues toward 8K and 16K, highly sophisticated CGI effects, and virtual reality. The need for dense banks of high-performance storage and the ability to transfer data between this storage and the workstations processing the data has never been more critical. Fibre Channel remains the only connectivity technology that is reliable, secure, and fast enough to handle this task.

## Problem

Modern production workflows involve the use of more and more digital assets. Not only are the number of assets used in an average production increasing, the size of the files is increasing as well.

Standard network infrastructures are typically built on 1Gb or 10Gb Ethernet, which can no longer handle the size and density of the data traffic involved in today's media workflows.

Ethernet connectivity at any speed may not provide guaranteed or sufficient speeds, low latency or adequate security to accomplish the objectives of the workflow.

Workflows and ROI are compromised due to inadequate connectivity not allowing users to exploit the full performance potential of production workstations, servers, and storage.

# ATTO Celerity™ Fibre Channel HBAs

## Solution

These challenges can be solved by ATTO Celerity™ Fibre Channel HBAs to 2019 Apple Mac Pros.

ATTO Celerity 32Gb, 16Gb and 8Gb Fibre Channel HBAs are optimized for extremely low latency, high-bandwidth data transfers at line rate.

The 2019 Mac Pro features eight PCIe slots for expandability and only one needs to be dedicated to a Celerity Fibre Channel HBA. A Celerity HBA is a high-performance connectivity option ideal for 4K and HD workflows, while a quad-channel Celerity 32Gb HBA ensures a Mac Pro's resources are fully utilized even when working with 8K and 16K assets.

Combine the high-performance of ATTO Celerity Fibre Channel HBAs with Apple Xsan® SAN software built into macOS, and you gain the absolute best shared storage experience you can create for the Mac Pro.

## Benefits

- Tested compatible with the 2019 Mac Pro®
- Utilizes existing, plug and play Fibre Channel infrastructure
- Hardware and drivers optimized for media workflows
- Powerful, centralized configuration and management of data paths using the GUI-based utility ATTO ConfigTool™
- Failover, failback and load balancing features available via exclusive ATTO MultiPath Director™ provide superior performance and continuous uptime
- Low, deterministic latency as provided by ATTO Advanced Data Streaming (ADS™) Technology smooths data streams improving workflow



# Upgrade Mac Pro Ethernet for supercharged network collaboration

Recommended product: ATTO FastFrame™ Network Interface Cards

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## Background

Ethernet networks are ubiquitous and are easy to implement. In many cases, an Ethernet infrastructure is all the networking a company needs to be successful.

Ethernet has matured as a network technology with the professional standard transfer rate being either 1Gb/s or 10Gb/s currently, although up to 100Gb/s is available in premium solutions.

High-performance protocols, such as iSCSI, have been developed for Ethernet which rectify performance issues and prior limitations, allowing Ethernet to evolve into a collaborative, shared storage area networking technology.

With a properly designed architecture, Ethernet is flexible enough and fast enough to cover all of the needs of many types of workflows.

## Problem

Standard equipment, running at standard data rates might lack the flexibility or power needed for the traffic and workflows expected of a media production environment. 4K, HDR and virtual reality workflows would be impossible to maintain using standard hardware.

Multiple client systems attached to network resources and storage can cause latency and bottlenecks throughout the network, which then compromises workflow efficiency.

The problems compound as workloads increase. IT administrators may then spend an inordinate amount of time and resources attempting to optimize the environment with few to no gains overall.

Media production and content creation are particularly sensitive to latency and congested networks, causing video and audio to lag, and threatening the integrity of file saves.



# ATTO FastFrame™ Network Interface Cards

## Solution

These challenges can be overcome by using ATTO FastFrame™ Network Interface Cards (NICs). These eliminate the bottlenecks of standard Ethernet networks and maximize the performance of Apple Mac Pro® workstations.

ATTO drivers and performance-tuning applications for FastFrame help system administrators optimize the environment with powerful, yet easy to use tools.

ATTO FastFrame 10/25/40/50/100GbE NICs are available in a variety of port configurations with speed options to match target workflows.

Exclusive ATTO technologies enhance the performance and feature set of FastFrame NICs and offer higher performance than available with built-in 10GbE ports.

FastFrame NICs with optical connectors enable long-distance networking not possible with copper wire.

## Benefits

- Tested compatible with the 2019 Mac Pro®
- Utilizes existing Ethernet infrastructure
- Accommodate 4K and HDR workflows with higher speed NICs
- Network latency is reduced and performance enhanced thanks to exclusive ATTO Advanced Data Streaming (ADS™) Technology
- ATTO drivers and software simplify configuration and management and are optimized to provide the maximum throughput for today's media workflows
- Interoperable with a wide breadth of industry leading software applications and hardware
- Complete optimization of Ethernet networks using ATTO 360™ Tuning, Monitoring and Analytics software
- Hardware and drivers optimized for media workflows



# Expand Mac Pro SAS/SATA ports for ultimate storage flexibility

Recommended product: ATTO ExpressSAS® HBAs

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## Background

Depending on the size of the studio and the nature of the work, workstations might be dedicated to just a few, or even a single task. Or, it could be a lone-wolf operation where a server isn't necessary, but scalable storage is mandatory.

No matter what the details of the environment are, there are many instances where a workstation needs to be directly connected to a JBOD, JBOF, a hybrid storage solution, or even a tape archive.

High-end media workstations use and generate a lot of data and with today's 4K, 8K, HDR and virtual reality content, the data is dense and it needs to flow quickly and reliably.

## Problem

USB 3.x might provide a cost-effective connection, but the performance is likely not adequate due to the technology's overhead, limited speed and inherent instabilities.

Thunderbolt™, while a better alternative to USB 3.x, is used by many other professional media devices. Routine connecting and disconnecting of permanent, critical storage is not an ideal solution. It's also multiple times slower than a PCIe option.

Ethernet connectivity may not provide guaranteed or sufficient speeds, low latency or adequate security to accomplish the objectives of a modern media workflow.

Archiving via USB, other standard ports, or into the cloud might be impractical, too slow, or too unreliable.

# ATTO ExpressSAS® HBAs

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## Solution

ATTO ExpressSAS® 12 and 6Gb SAS HBAs provide high-performance connectivity to direct-attached SAS and SATA storage with data protection. Available in a wide selection of port options to support a range of high availability, high-performance applications, including archiving to LTO tape.

Taking up just one PCIe slot, they leave Thunderbolt ports available for devices that are meant to be mobile.

A PCIe 12Gb ExpressSAS HBA in the correct configuration can achieve over six times the transfer rate of a Thunderbolt equivalent.

## Benefits

- Tested compatible with the 2019 Mac Pro®
- Connected drives perform just like internal drives
- Built-in PowerCenter Pro RAID 0, 1, 1e and 10 for performance and protection
- Up to 48% less power consumption than competitive offerings
- Low, deterministic latency provided by ATTO Advanced Data Streaming (ADS™) Technology
- Storage scalability and flexibility with simultaneous connectivity to multiple disk, RAID and tape devices





# Professional, high-performance connectivity options via Thunderbolt

Recommended product: ATTO ThunderLink® Thunderbolt™ Adapters

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## Background

As technology evolves, so does the need to connect more peripheral devices. Back in the day, it was serial cables. Today we have USB and Thunderbolt™.

Appearing in consumer machines starting in 2011, Thunderbolt was firmly established as a primary connectivity technology when Apple® made Thunderbolt 2 the only way to expand the second generation Mac Pro®.

With Thunderbolt you can connect monitors, audio and video interfaces, expansion chassis, network adapters and storage adapters. Thunderbolt's throughput has made mobile devices and laptops more flexible and powerful, and has given desktop and workstation users a means for high-performance expansion without opening the box.

## Problem

The new Mac Pros can be expanded via internal PCIe slots, which can fill up quickly in a fully specified unit. This leaves the Thunderbolt 3 ports as the remaining avenue for high-performance expansion.

Apple portable computers and second generation Mac Pros can only be expanded through Thunderbolt ports.

Standard components might lack the flexibility or power needed for the traffic and workflows expected of the environment. Client systems attached to network resources and storage via standard components can experience latency and bottlenecks, which affect user productivity, especially in media production environments. Modern HD workflows would be impossible to maintain using standard hardware.

USB may provide a cost-effective connection, but the performance is likely inadequate thanks to the technology's overhead, limited speed, and inherent instabilities.

Archiving over networks, via USB or other standard ports might be impractical, too slow, or too unreliable.

# ATTO ThunderLink® Thunderbolt™ Adapters

## Solution

By utilizing ATTO ThunderLink® Thunderbolt™ adapters, Mac Pros and other Apple computer platforms gain access to high-performance storage, network resources and peripheral devices.

ATTO ThunderLink Thunderbolt adapters are purpose-built adapters incorporating 32Gb, 16Gb and 8Gb Fibre Channel, 40Gb, 25Gb and 10Gb Ethernet, and 12Gb SAS/SATA. ThunderLink enables seamless integration of Thunderbolt 3 and 2 enabled devices to high-performance, high-capacity storage, like SSD/HDD RAID arrays, LTO tape drives, and shared storage networks.

ATTO drivers and performance-tuning applications for ThunderLink Thunderbolt adapters will help system administrators optimize the environment with powerful, yet easy to use tools.

## Benefits

- Tested compatible with the 2019 Mac Pro®
- Small, portable, stackable and rackable, ATTO ThunderLink Thunderbolt adapters conform to nearly all space requirements
- Designed for the rigors of the field with locking power supplies and built in Kensington® Security Slots
- Test and certified interoperable with major computer manufacturers, like Apple, and dozens of Fibre Channel, SAS/SATA and LTO storage solutions
- Low latency, high-performance data transfers ensured by ATTO Advanced Data Streaming (ADS™) Technology
- Powerful, centralized configuration and management of data paths using the GUI-based utility ATTO ConfigTool™
- Fail over and load balancing for Windows® and Linux® enabled by industry exclusive ATTO MultiPath Director™ for Fibre Channel solutions



# ATTO Xtend SAN™

# 5.5

The ATTO logo consists of the word "ATTO" in a white, bold, sans-serif font, centered within a dark gray rectangular box. This box is enclosed by a thick red border. The entire logo is set against a white background.

ATTO

**The Power Behind  
the Storage**

**macOS® iSCSI Initiator Software for Block Level Storage over Ethernet**

# Access block-level storage over Ethernet

## Recommended software: ATTO Xtend SAN iSCSI Initiator Version 5.5

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iSCSI is a storage networking protocol that provides block-level access to storage by using SCSI commands over TCP/IP networks. Set up a SAN environment even with limited IT budgets and resources and enable collaborative digital video/audio workflows, laptop connectivity to network storage, and remote backups.

ATTO Xtend SAN™ iSCSI Initiator Version 5.5 enables these abilities for macOS®. Since iSCSI isn't natively supported by macOS, Xtend SAN iSCSI Initiator provides a user interface that reflects the elegance and simplicity Mac users have come to expect.

ATTO Xtend SAN 5.5 includes support for multipathing, which increases SAN efficiency with consistent uninterrupted access to your data through failover and load balancing protection.

The simplicity of iSCSI makes it the ideal storage networking protocol for Mac users who are accustomed to the legendary ease-of-use of macOS. With this in mind, Xtend SAN's powerful features were carefully designed to be easy to set-up and manage.

### Benefits include:

- Create a shared storage network over Ethernet
- Adds multipathing capabilities
- Requires minimal effort
- Existing hardware can be repurposed into a SAN
- Rigorously tested for compatibility with leading products
- Lean, mature software with industry-leading performance
- Free upgrades for minor releases





**ATTO**  
**DISK BENCHMARK**

**The Industry-Leading  
Benchmark Tool Now for macOS®**

Easily monitor and test the performance of single drives or spanned volumes with the new Disk Benchmark for macOS®, brought to you by the trusted leader in high-performance network and storage connectivity.

**Learn how to download your copy**  
[www.atto.com/landing/mac-disk-benchmark](http://www.atto.com/landing/mac-disk-benchmark)





# The industry-leading benchmark software now made for Macs

## Recommended Software: ATTO Disk Benchmark tool for macOS

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Easily measure storage system performance with ATTO Disk Benchmark for macOS®, the new tool from the leading provider of high-performance storage and network connectivity products. Disk Benchmark monitors performance in hard drives, solid-state drives, RAID arrays, as well as connections to storage, allowing you to tune your storage system for optimal performance.

Compatible with macOS®, ATTO Disk Benchmark measures your storage systems performance with various transfer sizes and test lengths for reads and writes. Several options are available to customize your performance measurement including queue depth, overlapped I/O, and even a comparison mode with the option to run continuously.

Use ATTO Disk Benchmark to test any RAID controller, storage controller, host adapter, hard drive or SSD drive, and notice that ATTO products consistently provide the highest level of performance to your storage.

### Features include:

- Capture snapshots or run continuous benchmarks
- Ability to measure file and block level storage
- Support for variable transfer sizes and queue depths
- Non-destructive performance measurement of file system
- Custom transfer sizes
- Supports multiple disks for each test row

# The following list of ATTO products can expand and enhance the power and capabilities of the latest generation Apple computing platforms:

## Hardware:

ATTO Celerity™ Fibre Channel HBAs

Fibre Channel is the SAN connectivity technology major Hollywood studios rely on for their production workflows.

- 32 and 16Gb/s Gen 6 Fibre Channel with up to 12,800 MB/s transfer rates
- Available in various configurations with up to four SFP+ ports
- 8Gb/s options available

ATTO FastFrame™ Ethernet adapters

Ethernet is a cost-effective alternative for SAN connectivity and packs a performance punch with iSCSI.

- 10/25/40/50/100Gb Ethernet with up to 100Gb/s theoretical transfer rates
- 1 or 2 port configurations with optical SFP28, QSFP28 and copper RJ-45 options

ATTO ExpressSAS® HBAs

Direct-attached, dense connection to storage with data protection and built-in RAID capabilities.

- 12 and 6Gb/s SAS/SATA with up to 19200 MB/s transfer rates
- Up to eight internal or external ports in various configurations

ATTO ThunderLink® Thunderbolt™ adapters

Add high-performance Fibre Channel, Ethernet or SAS/SATA connectivity through external Thunderbolt ports.

- Thunderbolt to 32, 16 and 8Gb Fibre Channel
- Thunderbolt to 40, 25, and 10Gb Ethernet
- Thunderbolt to 12Gb SAS/SATA

## Software:

ATTO Xtend SAN™ iSCSI Initiator version 5.5

The ideal protocol for Ethernet SANs, made possible for Macs with our easy-to-use and feature-rich software.

ATTO Disk Benchmark™ for macOS

The industry-standard storage benchmarking software for Windows® now available for macOS.

ATTO Multipath Director™

A proprietary multipathing driver adds performance and features to ATTO Fibre Channel HBAs and Thunderbolt adapters.

ATTO ConfigTool™

Optimize storage connections built with ATTO HBAs to the maximum extent possible with this utility.

# About ATTO

For over 30 years ATTO Technology, Inc. has been a global leader across the IT and media & entertainment markets, specializing in network and storage connectivity and infrastructure solutions for the most data-intensive computing environments.

ATTO works with partners to deliver end-to-end solutions to better store, manage and deliver data. Working as an extension of customers' design teams, ATTO manufactures host adapters, network adapters, storage controllers, Thunderbolt™ adapters, and software.

ATTO solutions provide a high level of connectivity to all storage interfaces, including Fibre Channel, SAS/SATA, iSCSI, Ethernet, NVMe and Thunderbolt.

ATTO is the Power Behind the Storage.

## How to Buy

On the web:

[www.atto.com/howtobuy](http://www.atto.com/howtobuy)

+716.691.1999

VARs and System Integrators can also purchase ATTO products from the "How To Buy" page.

Be sure to follow us on social media.



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