

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 customer's design teams, ATTO manufactures host bus adapters, network adapters, protocol bridges, Thunderbolt™ adapters, and software. ATTO solutions provide high level connectivity to all storage interfaces, including Fibre Channel, SAS/SATA, iSCSI, Ethernet, NVMe, NVMe over Fabrics and Thunderbolt. ATTO is the Power Behind the Storage.

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Using ESXi with Thunderbolt enabled by ATTO ThunderLink adapters for Mac

VMware vSphere™ ESXi 5.1 introduced the Apple Mac Pro® to the VMware® Hardware Certification List (HCL). The refresh to the next generation of Apple Mac Pro hardware brought with it the introduction of Thunderbolt™ technology. As Apple refreshed the various Mac platforms with Thunderbolt ports in place of internally accessible PCIe slots, systems administrators, technicians and curious home lab users were challenged to adapt.

Overcoming Challenges

Familiar use cases including testing and validation for patch deployments and OS roll outs in corporate and education environments were just a few of the challenges that Mac systems administrators sought to overcome. The Thunderbolt port access seemed to be a limitation for ESXi, yet there was a need to adapt. Soon a community of users started to share best practices through their personal and community blogs, seeking assistance from Thunderbolt connectivity vendors to support their labs and test beds.

ATTO Technology Inc. was one such Thunderbolt adapter vendor that could help bridge the gap. Communications between ATTO and knowledgeable community resources and subject matter experts began and the idea for a Proof of Concept emerged.

ATTO, known for high-performance storage and network connectivity through a wide array of host bus adapters (HBAs) for Fibre Channel and SAS connectivity, already had a suite of VMware certified and HCL listed HBAs. How difficult could it be to add Thunderbolt connectivity, a PCI Bus technology, from the Mac Pro to a Fibre Channel supported vSphere ESXi environment? ATTO ThunderLink® adapters appeared to be the answer. The ThunderLink purpose-built Thunderbolt adapters shared the same driver code base as the ATTO Celerity™ Fibre Channel HBAs with VMware certified drivers. However, the VMware vSphere ESXi scenario had not been included as part of the routine product testing phase for the ThunderLink.

A test fixture was assembled at ATTO and product evaluation units were shipped to the Mac Administrator subject matter expert. A beta driver proved the hypothesis of the expert to be true. ATTO Fibre Channel ThunderLink adapters were able to offer Thunderbolt connectivity in ESXi use cases with Mac Pros.



How the Test Bed Proved Out

The test procedure was familiar to ATTO VMware Certified customer engineer, as well as the subject matter expert. In ATTO labs, a series of steps were followed starting with the Mac Pro 6,1. For testing purposes the Mac Pro 6,1 was fully loaded with an Intel Xeon E5 processor and 64Gb of RAM. All parameters for the ATTO test bed were kept in line with the VMware HCL and Apple's end user license agreement and OS licensing provisions.

A bootable USB drive was then formatted with a graphical user identification (GUID) partition and built with ESXi 6.0 on it. ESXi was installed to an internal drive on the host and the management parameters set as normal.

The ATTO ThunderLink specialized ESXi drivers were then installed and the VMware .vib file was uploaded to a datastore on the Mac. The requisite paths were then created and, noting that the installation was successful, normal virtual machine (VM) creation began to take place.

Datastores were created using the LUNS presented across the Fibre Channel fabric in vSphere or vCenter and assigning the VM to that datastore. A host reboot was then performed and Guest OS- Windows Server 2008 and macOS 10.11.2 installations were created for testing.

It was noted that when the Thunderbolt cable was pulled, the host needed to be rebooted. When the Fibre patch cable was pulled, there was no issue and no host reboot was required. A reboot with Fibre cable target pulled worked after the initial device discovery with the Fibre connected. Booting the host across the Fibre Channel link was not tested but is expected to work since the datastores could be assigned as such.

Testing in parallel, the subject matter expert used a clustered configuration with Apple hardware and OS connecting to Fibre Channel storage utilizing the ATTO ThunderLink adapters and specialized ESXi drivers with success.

The Key to Success

The key component to the success of the proof of concept was a specialized driver written by ATTO to enable the Thunderbolt ports connectivity via ATTO Fibre Channel ThunderLink adapters for configurability and access to vSphere ESXi environments.

The success of the proof of concept with the ATTO ThunderLink provides a means for several use cases including testing and validation, deployment and roll outs of OS updates and applications, in corporate and educational environments. It also could be used for support in large Mac client installations, XSan replacement, and home labs by Mac systems administrators and VMware certified technicians. Production use cases included support for heterogeneous OS environments. Configurations with vSphere Essentials enable small business users the ability to expand their footprint with a lower up-front investment.

The strategies employed behind the use cases were sometimes used to segment VLANs, replace out of support hardware or to compliment or augment existing vSphere environments. There also have been instances where utilizing the solution served as an interim action plan.

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