SOLUTION BRIEF

ATTO

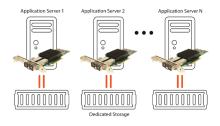### Challenges Include:

- Complexity of managing a growing infrastructure
- Underutilized server and storage devices
- Power and cooling constraints
- Limited IT budgets and resources – need to do more with less
- Access limitation to data and applications

Typical Data Center without Virtualization

Application Server 1   Application Server 2   Application Server N

Dedicated Storage

Data Center Virtualization and ATTO products
End-To-End Solutions Designed to Work Together

Overview

Virtualization technologies are rapidly becoming the foundation of modern data centers as IT managers seek dramatic improvements in resource and operational efficiencies as well as responsiveness to business needs. Three key technologies are significant: (i) Server Virtualization, (ii) Fabric Virtualization and (iii) Storage Virtualization. This paper describes how ATTO products serve as key building blocks for each of these virtualization solutions and offers an end-to-end approach that incorporates all three solutions.

Challenge

The advent of open-systems computing has promoted a rapid expansion in the number of deployed servers, often with each dedicated to a single application or business function. At the same time, IT managers have faced an explosion of online data with a corresponding proliferation of storage adapters. The result is an infrastructure that is nearly unmanageable. Many of the servers and storage adapters are underutilized; floor space, power and cooling concerns have become real limitations to data center expansion; and the sheer number of deployed adapters has become almost impossible to track.

For 30 years ATTO Technology, Inc., has been a key supplier of storage and network connectivity solutions. With a broad deployment of Fibre Channel-enabled host, infrastructure and storage products, ATTO is well positioned to power the data center's virtualized infrastructure. ATTO Fibre Channel technology contains key building blocks that enable customers to fully realize the benefits of server virtualization deployed in a storage area network (SAN) environment and extends the value of fabric virtualization. With end-to-end solutions, ATTO offers important enabling technology for partners building virtualized data centers.

Data Center Virtualization

To keep pace with growing business demands, data centers are transitioning to highly virtualized data center environments. This approach enables organizations to consolidate and simplify their IT resources, resulting in increased business agility and lower capital and operating expenses. But virtualization is not without its challenges. Data centers must keep up with the explosive data growth and dynamic changes driven by virtualized workloads. Having a suite of products that are designed specifically to work together is key to realizing the full benefits of these virtualized architectures.
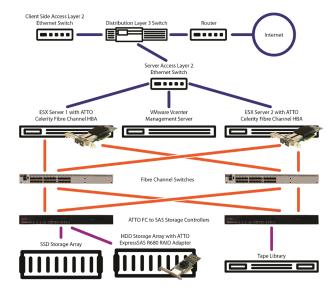
Server Virtualization

Server virtualization enables the deployment of multiple full-featured VMs across one or a few hardware platforms yielding a dramatic increase in server hardware utilization. Hardware resource scheduling and management is run behind the scenes by a hypervisor, a user-invisible operating system. Users report going from 15-20% up to 75-80% usage, with a proportional increase in server return on investment and reduction in management and maintenance overhead. While environments certainly differ, virtualization provides a wide realm of benefits including greater agility and efficiency, cost reduction and even self-service application provisioning.

ATTO host bus adapters (HBAs) play an important role in data center virtualization. In order to take full advantage of the benefits, HBAs must support the ability to virtualize Fibre Channel ports, provide guaranteed response time, transparently support connection into virtual fabrics as well as enable co-hosted applications to be configured and operating within separate virtual fabrics. The latest generation of ATTO high-performance 32/16Gb Gen 6 Fibre Channel HBAs bring virtual fabric integration to the next level by enabling a single adapter to connect into multiple virtual fabrics. N-PortID Virtualization (NPIV), a feature of ATTO HBA technology, enables each Fibre Channel HBA to define multiple "virtual ports," identified by Worldwide Ports Names (WWPN). These virtual ports can then be assigned each VM. NPIV lets administrators manage storage on behalf of the virtual machine in much the same way they manage storage attached to physical machines, leveraging familiar best practices and existing SAN management tools.

As IT professionals implement virtualization, administrators can minimize bottlenecks by installing Fibre Channel ecosystems that support required performance levels, growth plans and economic challenges. To address these challenges, ATTO products deliver scalable, high-performance advantages that correlate to a reduction in the number of physical server resources required to meet the demands of virtualized application workloads.

Key Benefits

- Cost effective deployment of new applications
- Faster, flexible provisioning for new applications, dynamic resizing of servers for growing applications and development and test platforms.
- Easier workload balancing, incident resumption and disaster recovery, as virtual machines (VMs) are more readily portable to alternate hardware resources and offer tools to automate these operations.
- Improved scalability for large or rapidly growing server and virtual server environments
- Reduced management from the network edge to the center of the SAN
- Support for heterogeneous SAN configurations

Client Side Access Layer 2 Ethernet Switch — Distribution Layer 3 Switch — Router — Internet

Server Access Layer 2 Ethernet Switch

ESX Server 1 with ATTO Celerity Fibre Channel HBA — VMware Vcenter Management Server — ESX Server 2 with ATTO Celerity Fibre Channel HBA

Fibre Channel Switches

ATTO FC to SAS Storage Controllers

SSD Storage Array — HDD Storage Array with ATTO ExpressSAS R680 RAID Adapter — Tape Library