

Redefining Storage Economics

Game-changing 10GbE price/performance with Arista and Coraid

Arista and Coraid completed joint interoperability testing using Arista 10 Gigabit Ethernet switches with Coraid EtherDrive Ethernet SAN Storage Systems demonstrating game-changing price/performance and simplicity for scale-out storage.

The Future of Storage Area Networks

Arista and Coraid are redefining the fundamental economics of storage with 10GbE-based SAN solutions that provide enterprises of all sizes with flexible, high performance, scale-out storage. Arista 10GbE switching technology combined with Coraid EtherDrive® storage arrays enable a scale-out 10GbE Ethernet SAN architecture that is ideally suited for server virtualization, desktop virtualization, cloud computing, and high performance computing delivering true competitive advantage. Coupling 10GbE Ethernet technology from Arista with low-cost high-capacity storage arrays from Coraid, EtherDrive SAN solutions exploit next generation technology to deliver affordable, fast SAN solutions that are budget friendly!

Powered by ATA-over-Ethernet

The Coraid EtherDrive family of SAN products is built upon ATA-over-Ethernet (AoE), an open lightweight storage area network protocol that runs on Layer 2 Ethernet. Designed for simple, high performance access of SAS, SATA and SSD storage drives over Ethernet; AoE provides the capability to build SANs with lower-cost, standard technologies. AoE is a thin protocol layer directly on top of Ethernet. Packets are addressed to devices using their MAC address. Since AoE is a Layer 2 protocol it does not require TCP or IP layers, eliminating

unnecessary processing. The simplest possible way of sharing a disk drive through a network, AoE is secure and direct. With fencing and reservation capabilities, AoE is the perfect technology for building affordably fast and simple SAN solutions for the virtualization environment.



Latency Is Important

By eliminating protocol layers and utilizing Ethernet congestion avoidance algorithms supported by Coraid's HBAs, Coraid EtherDrive storage enables near-bare-metal performance using Arista's ultra-low-latency 10GbE switches, deliver throughput that is up to 30% faster than Fibre Channel and 100% faster than iSCSI. Individual EtherDrive arrays running SAS drives can deliver throughput up to 1800 MB/s. Overall system performance can be inexpensively scaled up through the addition of more Ethernet HBAs and spindles. And with the deep buffers of the Arista 7500 family of switches featuring more than 40ms of per port packet buffering, conditions such as fan-in, which arise when multiple servers need to access the same storage data, are well handled. Additionally, with the Arista 7100 family, the use of a Dynamic Buffer Allocation capability allows the switch to deliver the lowest latency possible without compromising the ability to handle congestion.

Performance Testing

Performance was tested using the IOMETER workload generator via simulated application workloads based on streaming media services. The tests confirm Arista and Coraid’s ability to deliver predictably scalable performance.

As the table below shows, streaming media performance was excellent, delivering 826 MB/sec from just 16 SATA drives and scaling to more than 1,800 MB/sec from 36 SATA drives. Put into perspective, a single shelf was able to drive enough bandwidth to saturate a 10Gbps interface.

Configuration	Workload	MB/sec
16 x SATA	Streaming Media	826
24 x SATA	Streaming Media	1211
36 x SATA	Streaming Media	1880

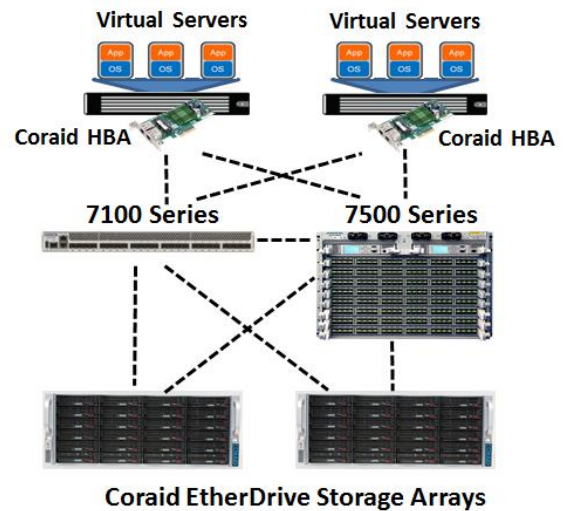
All of these numbers were attained with large IO transfers with multiple outstanding IO.

Simplified Administration

No more complex SAN topologies - no more forklift upgrades - no more esoteric Fibre Channel issues. Coraid’s CorOS™ provides the ultimate in simplicity; arrays can be deployed in minutes with as few as three configuration commands. Ethernet SAN drivers developed by Coraid have been included in most Linux distributions for years, and high performance Coraid Ethernet HBAs can easily be installed in existing servers. By utilizing ubiquitous Ethernet, Coraid solutions vastly simplify the deployment and scaling of storage systems making it possible to manage Terabytes to Petabytes without a dedicated SAN administrator. Arista's VM Tracer management tool makes it possible to gain visibility into the virtual and physical network, while adapting dynamically to changes in the virtual infrastructure. And with Arista's Zero Touch Provisioning (ZTP) it is possible to provision and expand the storage fabric in real-time.

Recommended Configurations

Arista and Coraid completed joint interoperability testing. Using Arista core and top-of-rack switches and Coraid storage arrays, customers can build scale-out configurations ranging from 4TB single storage appliance to a multi-petabyte system by simply adding more storage appliances.



Virtualization and the Cloud

Virtualization has brought undeniable benefits to enterprise IT—reduced costs, server consolidation, increased flexibility, automated management and more. Coupled with powerful, scale-out x86 servers, virtualization enables enterprises of all sizes to move toward cloud architectures that achieve massive scale using commodity hardware, multi-tenant segmentation, elastic expansion, and automated self-service. Unfortunately, all of the cost and agility benefits of enterprise virtualization can come to a screeching halt when data reaches the storage network. Current SAN technologies (Fibre Channel, FCoE, & iSCSI) are too expensive, too complex, and poorly adapted for today’s dynamic virtualization workloads. The Arista and Coraid solution provides a scalable Layer 2 storage fabric that can grow to support thousands of servers and petabytes



of storage - while maintaining the breakthrough cost and performance metrics necessary to implement dense virtualization.

Summary

Storage solutions from Arista and Coraid provide unmatched cost/performance advantages for customers today. With solutions from Coraid and Arista, it is possible to address both today's application performance requirements as well as build a virtualized infrastructure that paves the way for a cloud storage environment of the future. Energy efficiency, storage efficiencies and operational costs are all prime focuses of the Arista-Coraid joint solution. Arista's state-of-the-art network switches provide optimal performance for storage traffic and eliminate performance issues associated with latency and inadequate packet buffering, while Coraid's high-performance, affordable and scalable network storage give unique and dramatic storage advantages - especially within HPC and virtualized environments. The dynamic allocation of storage and networking resources within a virtualized environment is made possible by management tools like VM Tracer from Arista. A cloud storage infrastructure can now be built with a joint Arista-Coraid offering featuring a redefinition of storage economics, performance, service automation and scalability.

ABOUT Coraid

Coraid is a leading developer of Ethernet SAN storage solutions that provide enterprises of all sizes with flexible, high performance, scale-out storage. Coraid uniquely delivers the fundamental building blocks necessary to build the next generation SAN infrastructure for a range of applications including, server virtualization, high-performance computing, video, and cloud storage. www.coraid.com

ABOUT ARISTA NETWORKS

Arista Networks delivers cloud networking solutions for large data center and computing environments. Arista leads the data center Ethernet switching industry with innovation in switching hardware, performance, and the EOS platform. www.aristanetworks.com

© Copyright 2011 Arista Networks, Inc.
Information contained herein is subject to change without notice. Arista and the Arista logo are trademarks of Arista Networks Inc.