



NetApp®
Go further, faster



Joint Solution > IT Cloud Infrastructure

Unique Capabilities of the Arista and NetApp Product Offering

KEY FEATURES

Price-performance

Arista's state-of-the-art network switches provide up to five times the performance with dramatically lower capex and opex than legacy data center switches.

Energy efficiency

The Arista 7000 family of switches is designed for the energy requirements of today's data centers with a power draw that is 1/10 that of traditional switches.

Seamless support for virtualized environments

Adapt the physical network infrastructure to changes in the virtual environment of the data center in real time with Arista's VM Tracer tool.

Cloud storage infrastructure

With up to 384 fully nonblocking 10GbE ports in a single 11 RU system, Arista switches support a scalable, low-latency storage fabric optimized for cloud storage infrastructures.

THE CHALLENGE

Data centers are changing and evolving in significant ways. Cost efficiencies are being achieved through server virtualization, optimizing the use of server memory and CPU in the data center. At the same time, data storage is exploding, with continually growing unstructured file-based data surpassing transaction-based data as the dominant form of content. Consequently, the issues surrounding data storage and the associated storage fabric are becoming increasingly complex and costly, and enterprises are looking to achieve similar cost efficiencies with storage infrastructure as they have with their virtualized servers. Enterprises need to build data center storage infrastructures today that can cost-effectively handle today's performance and scalability requirements while easily migrating to the cloud infrastructures of tomorrow.

OVERVIEW

Arista Networks and NetApp have collaborated since 2009 to provide leading-edge storage solutions for the data center. Arista's cloud networking

approach combines with the NetApp approach to storage to enable cloud infrastructures to deliver a compelling alternative to legacy approaches for building high-performance, scalable, and efficient storage environments.

JOINT VALUE PROPOSITION

The Arista and NetApp® storage infrastructure solution for the data center provides the leading price-performance option for companies engaged in building virtualized data centers as well as powerfully addressing the needs of environments such as high-frequency trading, CAD/CAE/EDA, seismic processing, media and entertainment, and data warehousing. Arista's state-of-the-art network switch architecture combined with NetApp features such as deduplication and Snapshot® technology results in highly cost-efficient and high-performance storage solutions.

SOLUTION BENEFITS

Optimized architecture for cost-effective, high-performance storage
Storage environments are increasingly moving away from DAS or Fibre Channel-based implementations to

ARISTA

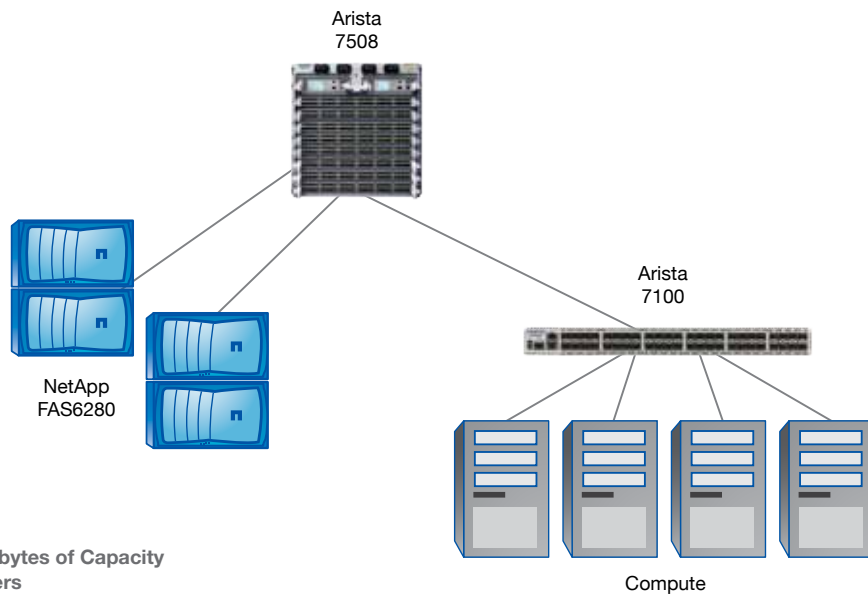


Figure 1) Scales to Petabytes of Capacity and Thousands of Servers

either IP-based or NAS deployments. This has happened as a result of the need to achieve greater efficiencies from storage infrastructure, as well as the increasing prevalence of unstructured data within the enterprise. Within these new infrastructures, the network fabric that ties servers to networked storage has taken on increasing importance; indeed, a number of critical requirements for this storage fabric are met by the joint Arista and NetApp solution.

Low latency to maximize application performance

The lower the latency between a storage write and the acknowledgement from the storage target, the more efficiently the host can process data and applications. Arista 10GbE switches are leaders in providing the lowest latency available, ranging from 600 ns for 24 ports to 4.5 usec at a 384-port density with the Arista 7500 series.

Deep buffers

Two classic conditions exist in storage environments that can be significantly ameliorated with the presence of deep buffers in a network switch. The first of these is most commonly found in environments in which multiple servers or initiators need simultaneous access

to the same storage data, a situation known as fan-in. Products such as the Arista 7500 switch family, with more than 40 ms of buffer on a per-port basis, have been shown to dramatically improve this situation. This issue can also be addressed through the use of a dynamic buffer allocation capability, which allows the switch to deliver the lowest latency possible without compromising the ability to handle congestion.

The other principal need for deep buffers occurs when a speed mismatch exists between the compute nodes (often connected at 1GbE) and the storage (often connected at 10GbE). In this situation, deep buffers can handle the bursty storage traffic patterns that often result without dropping packets, which causes TCP retransmission timeouts that severely affect application performance. The Arista 7000 series with its deep buffers and advanced congestion management is specifically designed to address the challenges of these environments.

Storage fabric consolidation

Because of the flexibility of the Arista and NetApp solution, it is possible to consolidate multiple storage access

methods onto a single high-performance 10GbE storage infrastructure, with support for NAS (NFS and CIFS), iSCSI, and FCoE/DCB. NetApp's unified target adapter cards facilitate the migration of Fibre Channel environments to higher-performing, lower-cost 10GbE end-to-end environments running FCoE/DCB with Arista switches. 10GbE-based fabrics offer the benefits of lower cost, higher performance, and reduced cabling complexity over either 1GbE or Fibre Channel environments.

Purpose-built for the data center

Arista network switches and NetApp storage are purpose-built for data center environments and feature high-availability features such as redundant, hot-swappable power supplies and fans. The Arista network switch runs a modern operating system, EOS (Extensible Operating System), which features a single binary image that runs on all switches. EOS offers important features such as in-service software upgrades (ISSU) and stateful fault repair (SFR) for automatic self-healing switch functionality.

SOLUTION COMPONENT

NetApp Products

FAS2000 series

FAS3100 series

FAS3200 series

FAS6000 series

FAS6200 series

Data ONTAP®

OnCommand Management Software

FlexCache

Arista Products

7000 switch

7100 series

7500 series

VM Tracer

Zero Touch Provisioning

Built green

Arista switches feature the latest in energy-efficient technology: The Arista 7500 modular switch family uses less than 10 watts/10GbE wire speed ports.

Targeted solution for virtualized environments

The most significant disruption in data center environments at present is the virtualization of resources. The opportunity to achieve cost efficiencies by reducing or eliminating underutilized server resources has been a fundamental dictate of IT policy over the past few years, accelerated by the multicore designs of microprocessor leaders Intel and AMD.

Visibility into the physical and virtual network

With the move to a virtual infrastructure model has come a new set of issues for network and storage administrators who have to work within this environment. The ability to see and manage both the physical as well as the virtual infrastructure is addressed by tools such as Arista's VM Tracer, featuring VM Auto Discovery and VM Host View for physical and virtual network visibility, as well as VM Adaptive Segmentation to automatically respond to needed

VLAN configuration changes associated with VMotion™ events. NetApp provides tools such as NetApp SANscren® that deliver infrastructure visibility and monitoring, which results in proactive capacity planning to optimize the virtual infrastructure.

Scalability

Virtualized environments demand large, flat Layer 2 domains to function. With features such as Arista's Multi-Chassis Link Aggregation (MLAG), it is possible to build a storage infrastructure with fewer hops, lower latency, and less cost, which scales to petabytes of storage and thousands of servers. This dense virtualization is possible not only because of the software features of Arista EOS, but also because of the unparalleled capacity of products such as the Arista 7500 series.

Cloud storage infrastructure

Spending on cloud services is increasing at a significant pace: the economics of cloud computing, whether private or public, are compelling, and forward-looking IT organizations are studying how best to leverage the promise of IT as a service. A number of key elements must be addressed in any deployment of a cloud storage infrastructure in

order to achieve the efficiencies promised by the cloud model. One thing, though, is quite clear: Virtualization of the data center is the first step on the path to cloud computing.

Secure multi-tenancy

Multiple organizations or departments must be able to share the same storage infrastructure. NetApp MultiStore® technology, coupled with Arista's VM Multi-Tenancy capability, which allows a single switch to connect to and participate in multiple virtualization domains concurrently, addresses this need. This is ideal, for example, for environments with a mix of production and lab services.

Service automation and management

The ability to automate the monitoring, provisioning, and management of the storage fabric within the data center is fundamental to cloud computing. NetApp SANscren and NetApp Provisioning Manager, along with Arista's VM Tracer functionality, make this a reality. Changes to the cloud infrastructure are detected in real time, and appropriate actions are taken to meet SLAs and provide data security and integrity. As well, Arista's EOS network operating system is extensible

and can run standard Linux management tools directly on the switch (eg, DHCP, TFTP, PXE, Rancid). This allows the switch to be used in place of a stand alone management configuration server (for example for providing configurations to NetApp filers), and can even be further customized with user-written extensions for higher levels of service automation.

Data mobility

The ability to freely move applications and datastores so as to maximize the overall performance of applications and the utilization of infrastructure within the data center is essential to the success of the cloud computing model. Within the cloud storage infrastructure, features such as NetApp Data Motion and Arista's VM Adaptive Segmentation dynamically respond to changes within the cloud infrastructure and help optimize the overall efficiency of IT resource utilization.

Operational simplicity

Within a cloud storage infrastructure, it is important to be able to provision,

deallocate, expand, and decrease storage in real time. NetApp's thin provisioning technology, combined with Arista's Zero Touch Provisioning (ZTP) capability, makes it possible for the storage infrastructure within the cloud to scale up and scale down as needed.

With a storage infrastructure solution from NetApp 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, platform acquisition, and operational costs are all prime focuses of the Arista and NetApp 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. NetApp FlexCache® software accelerates the availability of frequently used files. The dynamic allocation of storage and networking resources within a virtualized environ-

ment is made possible by management tools such as VM Tracer from Arista. A cloud storage infrastructure can now be built with a joint Arista and NetApp offering featuring data security, data mobility, service automation, and scalability.

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.

ABOUT NETAPP

NetApp creates innovative storage and data management solutions that deliver outstanding cost efficiency and accelerate performance breakthroughs. Discover our passion for helping companies around the world go further, faster at www.netapp.com



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