Arista shakes up data access management with DANZ

Analyst: Peter Christy

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When Andy Bechtolsheim founded high-speed switch vendor Arista Networks, the hardware design represented a new direction for him, because it wasn't based on complex and proprietary silicon ASICs. Instead, the Arista design focused on elegant packaging of standard parts and an innovative approach to how the switch software was architected. Staffed by pedigreed graduates from Cisco and other networking vendors, Arista has sought markets where a new company with necessarily limited functionality and resources (certainly compared with Cisco) can succeed.

Now, with its Arista Data Analyzer ('DANZ') offering, it has identified an intriguing new market that leverages its unique switch design and at the same time gives it a 'Trojan Horse' entry into new customer accounts. DANZ is touted as an integrated feature set of Arista's Extensible Operating System aimed at addressing monitoring and visibility, and is currently available on the Arista 7150-series switches.

The 451 Take

Arista has produced an innovative and differentiated option for data access management by leveraging its successful switch line to create an offering in a new market with distinctly better performance and cost efficacy than the incumbent vendors, and by integrating the performance measurement into a competitive core switch offering. This gives Arista multiple ways to market a performance-analysis data-gathering system, as well as a way to get a foot in the door with new customers and markets.

Context

Arista was founded in 2004 and funded by Andy Bechtolsheim and David Cheriton, two successful entrepreneurs with an impressive set of earlier wins, including Granite Systems, the company Cisco acquired in 1998 to get its high-performance Catalyst switch family. The two were also the first external funders of Google in 1998. At the beginning of 2013, Arista had grown to more than 500 employees and 1,800 customers. The company claims it is profitable, and many expect an IPO from Arista in 2013.

Prior to Arista, Bechtolsheim's hardware products had emphasized the innovative use of complex proprietary silicon parts that both created product differentiation at market entry and provided a significant barrier to entry for potential competitors. In surprising contrast, the first Arista switch was built from standard merchant parts with innovative system physical packaging (e.g., remarkable port density) and cooling, as well as a distinctive software architecture, making a clear statement that he thought software was the key to switch development – well in advance of today's software-defined networking (SDN) craze.

Switches depend on the use of high-speed packet-forwarding ASICs. Prior to Arista, leading high-speed switches used proprietary ASICs that the switch vendor had designed internally. Doing a state-of-the-art ASIC is a substantial engineering task, requiring lots of special tooling, and all those costs have to be amortized across the chips that are manufactured – in many cases, these engineering costs are larger than the actual fabrication cost – so ASIC economics clearly favor the largest vendors with the largest product volumes.

These economics invert when merchant silicon (designed and manufactured by a third party) volumes exceed the volume of the largest proprietary ASIC – as when Intel x86 volumes grew beyond those of the biggest proprietary architectures. When this happened, the computer business collapsed relatively rapidly onto a single architecture (x86), and the CPU was effectively commoditized. OpenFlow advocates anticipate the same opportunity at some point when merchant silicon volumes exceed even Cisco's volumes – although in markets where Cisco has 70% share, that would require Cisco adopting these parts as well, leading to a commoditization of the parts and a price reduction in the incorporating switch due to increased competition.

Target market

The goal of the product space that Arista is aiming at with DANZ – which 451 Research has been calling data access management (DAM) – is to analyze network performance in order to produce

meaningful operational or business information. There are three broad categories of uses: network operations, application performance management and regulatory compliance (including lawful intercept).

This market space is complex because different vendors provide different pieces of the overall solution. Cisco comes the closest to proving complete packages here, although many other vendors provide tools for Cisco networks as well. Arista leveraged its existing switch design to provide the means of selecting and intercepting the traffic, and it uses the switch as an inexpensive and high-performance means of aggregating what is gathered, leaving the analysis to the existing suppliers of those packages.

Technology

Despite Bechtolsheim's extensive systems expertise, Arista was built on the use of merchant silicon, betting that it could be competitive and have the advantage of building its own software architecture from scratch and having deep network business experience. The company picked markets and use cases it could satisfy with such an offering, including high-speed trading (where switch latency is key) and high-performance computing (where speed and cost are emphasized).

In the eight-plus years since Arista was founded, it has grown into a large consumer of third-party ASICs. For the current ASICs, Arista has worked with suppliers and contributed to the system architecture and micro-code programming logic of the silicon full-custom switch ASIC. Thus, Arista gets much of the benefit of proprietary chip designs, but without having to staff or fund the actual development.

Within the SDN discussion, another important aspect of Arista's core technology is that, unlike other conventional device vendors, it is possible to run fairly standard Linux applications within the Arista switch. It achieves this via a unique software architecture that separates the real-time aspects from the higher-level software and introduces a publish/subscribe mechanism, with which a higher-level application can request to be informed of specific internal changes to the switch state.

Products

In this context, we can discuss DANZ – a high-performance, programmable, application-aware probe and data-aggregation system to be used in DAM offering (Arista is not introducing its own analysis software.) To be clear, this is a new use case for a standard Arista switch, as opposed to a new and different product. With the exception of Cisco's NAM, the Arista offering is more tightly integrated with a widely competitive core switch than those of other hardware vendors. It gains in

cost-efficacy as a result, as it does from its low-cost design emphasis and high production volumes.

Increasing switch port speed from 1Gbps to 10Gbps and then 40Gbps requires a lot of increasingly difficult re-engineering of network analysis and aggregation hardware. Arista can leverage its core product development for this purpose, however. From the beginning, it has emphasized low prices per port for its switches and claims that, compared with its aggregation network vendor competitors, Arista switches are 10X cheaper per port, and the switch as a whole has 3X the capacity. The most disruptive use of Arista technology is to simply build the network with Arista switches and get the performance monitoring and aggregation capability integrated effectively for free. Recognizing that there are many prospective customers who won't choose to forklift upgrade their networks to do this, a DAM system can be built with Arista switches. That allows Arista to get into the customer's network – an ideal position from which to grow the business with a new account.

The implementation of the Arista product is an example of its working relationship with its merchant silicon vendor. Because Arista contributed to the design of the chip and its firmware, it could assure hardware support for the functions that it viewed as most important. Arista claims that because the monitoring is integrated into the switch core, it can time-stamp events with 20-nanosecond granularity – so that it's possible to follow specific traffic through the network and see exactly where latency and jitter are occurring.

Strategy and marketing

Arista continues to do a capable job of incrementally improving its product with the resources available to a smaller vendor, and finding markets and applications where it can be a strong participant (e.g., high-speed trading, and HPC earlier) without necessarily having a full complement of network functionality to match Cisco's.

Arista has chosen to position itself as the leader in 'software-defined cloud computing,' which reasonably emphasizes both the high programmability of the Arista switch and its good match with datacenter computing. In practice, the industry veterans at Arista have pragmatically identified a set of specific use cases where the Arista switch can win significant market share.

Data access management is the latest example of identifying such a market that leverages Arista's core product development. DANZ exploits the existing switch platform to create a disruptively inexpensive yet powerful probe and data-aggregation system that expands the market for the existing switch product line and also provides the opportunity to sell to new customers.

Competition

There are two main categories of vendors to consider in terms of competition. According to Arista, the other vendors that use network performance data (e.g., analysis software vendors) are actually keen to have the DANZ offering, since – at least for now – Arista shows no intent to compete with these analytic systems.

Meanwhile, vendors that sell probe and aggregation systems, such as Net Optics and Fluke Networks, are quite a different story, and would clearly be threatened by Arista because of its disruptive price and capacity, as well as the fact that the probe technology is integrated into a standard switch offering. We're not sure if customers will view this as directly competitive with Cisco's NAM, but those customers willing to explore non-Cisco products will likely find this an attractive market entry.

SWOT Analysis

Strengths

Compared with most of the network performance hardware vendors, Arista is larger and likely more profitable, with a proven core networking capability. Arista has been on the leading edge of switch software advances and the aggressive use of merchant silicon.

Weaknesses

Arista is still a tiny vendor compared with Cisco, and is rumored to be an IPO candidate – after which it will sit in the light of quarterly financial scrutiny.

Opportunities

Arista's clean internal software makes it easy to attack many of the market opportunities being unearthed by today's SDN frenzy, but without the disruption inherent in many of those offerings.

Threats

Increasingly, Arista's success and growth will put it into more direct competition with Cisco – never a desirable situation.