

## Thought Leadership Discussion on Does Converging the LAN and SAN Make Sense

With Arista, Avaya, Brocade, Cisco, Extreme Networks and HP  
The Data Center LAN Evolution Series

Summary - November 2011

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This is a summary of an online discussion that took place during the fall of 2011. The discussion was about the viability of converging the LAN and SAN and involved Arista, Avaya, Brocade, Cisco, Extreme and HP. A full copy of the discussion can be found [here](#).

The discussion began with a question that asked the vendors to provide high level guidance to IT organizations relative to converging the LAN and the SAN in their data centers. Avaya stated that a top of mind issue relative to converging the LAN and SAN is Fibre Channel over Ethernet (FCoE) and a suite of technologies that are broadly grouped together as Data Center Bridging (DCB). DCB is important because it enables the underlying network to transition from being best-effort to become truly lossless.

HP suggested that IT organizations should carefully characterize SAN-LAN consolidation and simplification opportunities as they consider technologies like FCoE, NAS, DAS and iSCSI all as potential viable approaches. HP recommended that IT organizations start at the server edge and that when considering FCoE, they should look first to server vendors who have complete integrated solutions and not just the FCoE components.

The advise that Cisco provided fell into three main areas. One area of advise was that converged networks should not denigrate critical aspects of the existing IT environment. The second area of advise was that organizational transitions takes longer than technology transitions and so IT organizations should review their IT personnel with due diligence. The third piece of advise was for IT organizations to keep an open mind when choosing their convergence platform as the conventional wisdom that only Fibre Channel switches can support rigorous storage requirements is no longer true.

Extreme Networks stated that the adoption of 10 GbE opens the door for LAN-SAN convergence but that IT organizations need to consider a few items prior to converging their LAN and SAN. One such consideration is the performance of storage traffic on an Ethernet fabric, particularly in the presence of bursty data traffic. Another consideration is that traditional

ARISTA  
AVAYA

BROCADE

CISCO

extreme  
networks



network architectures with multiple network tiers need to be flattened to one or two tiers. The third consideration that Extreme mentioned was similar to one of Cisco's suggestions. That consideration was that the limitations of organizational silos need to be overcome.

The second question in the discussion was "How will end to end LAN-SAN convergence benefit customers?" The question asked specifically about the ROI that IT organizations could expect as well as whether or not there were any tools that could be used to quantify the savings?

Cisco equated SAN-LAN convergence with unified fabric and stated that a unified fabric brings three distinct benefits to the data center. One of the benefits is the simplification that results from reducing infrastructure sprawl and device proliferation. Another one of the benefits is agility, which in this context means the more efficient use of network capacity and the capability to set up, move, and change physical and virtual assets with greater speed. The third benefit is the efficiency that results from eliminating infrastructure duplication. Cisco provided an IDC whitepaper that stated that businesses with fully converged networks can achieve an ROI of up to 492% with an 11 month payback and a 45% CapEx saving. Cisco also provided a TCO tool which is based on the IDC research.

Arista presented a somewhat different perspective than the other vendors and suggested that the convergence of LAN and SAN is not as relevant as the convergence of storage and data traffic onto a common transport. Arista pointed out that almost all of the data traffic is IP-based as are many storage networks; e.g. those based on NAS, NFS, iSCSI. In contrast, some legacy storage systems such as FCoE are constrained to a single subnet and so the storage can only be used by a small subset of the hosts. This has the impact of greatly limiting VM workload mobility which Arista believes is a serious constraint based on Arista's belief that for many enterprises the number one priority is to enable virtualization.

Extreme pointed out that an end-to-end LAN-SAN converged infrastructure will require an initial investment but that convergence leads to several benefits that result in a tangible ROI. These benefits include leveraging the price-performance curve of Ethernet, eliminating multiple switching infrastructures, eliminating separate NICs/HBAs (Host Bus Adapters) and leveraging common cabling. Extreme also stated that a converged LAN-SAN can result in a reduction in both personnel costs as well as the cost of power.

Avaya stated that the benefits of a converged LAN-SAN come in the form of reduced capital expense (equipment, rack space, and cabling) and reduced operational expense (power, cooling, and expertise for multiple infrastructures). Avaya added that one of the other factors that commonly features in a business case for LAN-SAN convergence is a more general transition to 10 GbE which provides a significant capacity and performance boost. Avaya added that while there may be supporting justification, the introduction of 10 Gigabit will probably elongate the ROI period.

The third and last question in the discussion was "How do you manage and operate an end to end SAN-LAN converged network?" In their response, Cisco said that there are three key requirements. One of those requirements is a converged management platform that includes functionality such as provisioning and monitoring. The second requirement that Cisco mentioned is role-based access control (RBAC) to enable the tasks and roles of the SAN and LAN administrators to be kept separate and contained. The third requirement is the ability to

have a VM-aware topology view that shows all the dependencies from the VM out to the physical host, through the fabric, and to the storage array.

Brocade answered the question by saying that operating and managing an end-to-end converged LAN-SAN network requires careful planning around technical considerations as well as organizational and process concerns. From a technical perspective, there is increasing consensus that FCoE may have some benefits within and below the access layer. However, making the case to extend FCoE beyond the access layer requires a determination as to where to cut over to Fibre Channel-proper. Other key questions that have to be answered include Who is responsible for the traffic? Do separate networking and storage teams need to be brought together? How do they change their operating policies and procedures?

Avaya emphasized that Ethernet storage area networks run on the same standard Ethernet technology that IT departments have used for decades. In contrast, Fibre Channel Storage Area Networks utilize a specialized Fibre Channel network and are implemented with arbitrated loops or expensive proprietary infrastructure. Avaya recommends a converged network solution whereby storage is now another application that requires transit with priority handling and that travels in segregated virtual networks across a common infrastructure. Similar to what Cisco recommended, the Avaya recommendation enables a separation between the roles of the LAN and SAN administrators.

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